Not in It for the Long Run: The Impact of Immersive Journalism on News Avoidance Behaviour

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Abstract

Declining audience numbers and increasing news avoidance have inspired news organizations to investigate innovative ways to retain the audience's interest. One of these innovations is immersive journalism. Despite the trend of this innovation toning down after 2018, the medium is expected to make a comeback in the future. Expectations for immersive journalism are high in terms of immersion and engagement but worries also exist about the experience of heightened emotions resulting in news avoidance. This article examines how news consumption using immersive technologies impacts news avoidance. A laboratory experiment (N=61) following a two-factorial between-subject design including four conditions (VR high/low arousal negative valence, 2D high/low arousal negative valence) was constructed. The skip intention of participants was measured across all four conditions, and the impact of novelty was investigated by comparing the news avoidance of participants with and without prior VR experience. Although results show that skip intention overall is highest among those watching 2D news videos, skip intention increases most during the video sequence for those watching in VR. Thus, these results suggest that novelty plays a large role in the avoidance of immersive news stories, especially when watching high-arousal VR videos. The results carry implications for understanding how immersive journalism can trigger or counter news avoidance. A carefully considered mix of high and low-arousal news content is needed to prevent a 'shock' moment and make immersive journalism live up to its potential to engage the audience.

Introduction

It is a constant battle for news media to retain audiences, especially when interest in news seems to be declining (Villi et al., 2022; Cheng & Verboord, 2024). One of the reasons why interest in the news is declining is because people avoid the news (Villi et al., 2022). News avoidance can be intentional or unintentional (Skovsgaard & Andersen, 2020). Unintentional news avoidance has to do with the audience unconsciously 'opting' out of media content they do not like, because the diverse media landscape offers a lot of alternatives (Skovsgaard & Andersen, 2020; Damstra et al., 2023). Intentional news avoidance happens when people consciously tune out because they do not like the news (Villi et al., 2022). This can have both cognitive and emotional drivers.

A cognitive driver for news avoidance can be the sense of overload that can come about when there is a sense that there is too much news to keep up with (Villi et al., 2022). This kind of news avoidance is likely to occur in the present-day media environment, where news stories are brought to the public by several news outlets, such as newspapers, television, radio, and social media. Emotional drivers for news avoidance can be the focus on negativity in the news or other emotional reactions to news items (Villi et al., 2022).

People becoming less interested in the news or even avoiding it altogether can have implications for both the news industry and society at large (Toff & Kalogeropoulos, 2020). When people turn away from news outlets, this could mean news companies lose audiences. News usage is also closely linked to an increase in knowledge about politics, participation in democratic processes, and showing up at elections (Liu et al., 2013). Avoiding the news could result in people no longer being exposed to societal and political information (Liu et al., 2013).

However problematic, declining audience numbers and increasing news avoidance can also inspire news organizations to look into innovative ways to retain the audience's interest (Hendriks Vettehen et al., 2019). News outlets have explored several ways to do so, ranging from social media to audience metrics or news recommenders (Helberger, 2020; Dodds et al., 2023). Another one of these innovations is immersive journalism.

Immersive journalism is a field of journalism where immersive technologies such as virtual reality and 360-degree video are applied to enable viewers to experience (news) situations as if they were present themselves (Shin & Biocca, 2018). Over recent years, immersive journalism has become an emerging field of interest for both journalistic practitioners and scholars (Greber et al., 2023). News outlets experimented with immersive technologies in the early and late 2010s but due to technological restrictions and funding

difficulties, it got brought to a halt after 2018 (Resendez, 2024). In recent days, developments in the VR-glasses realm, as well as a new-found interest of tech companies in creating virtual realities, led to renewed interest in immersive technologies in the field of journalism (Cheng & Verboord, 2024). This could result in news outlets picking up on developing immersive news stories again.

Immersive journalism differs from 'regular' journalism based on its technological modalities (Sundar et al., 2017). In an immersive experience, a device blocks out stimuli from the outside world and accommodates several sensory experiences (Biocca & Delaney, 1995; Slater, 1999). This could, in turn, lead to an enlarged sense of being present at the news event and heighten immersion (Decock et al., 2014; Sundar et al., 2017; Biocca & Delaney, 1995; Slater, 1999). Heightened feelings of being there can result in the user adopting the emotions shown in the media content to a higher degree (Shapiro, 2019; Cummings et al., 2021).

Bujić et al. (2020), for example, found that immersive experiences can lead to a positive attitudinal change in users regarding how they feel about, i.e., human rights topics. However, immersive journalism can also have negative implications. Several scholars touch upon immersive journalism leading to concerns about ethics (Sánchez Laws, 2019; Kool, 2016). It could well be that the sense of being there in the story will leave the audience with the same feelings as those experiencing a news event (Sánchez Laws, 2020). Other ethical concerns regard data collection and protection (Dodds et al., 2024).

Building upon research on news avoidance, the powerful emotional triggers embedded in the technologies surrounding immersive journalism could also mean that users will become emotionally overwhelmed or distant (Resendez, 2024; Villi et al., 2022). Despite scholars addressing concerns on immersive journalism, little research has been conducted on the implications of the user experiencing high emotional content in an immersive setting (Resendez, 2024).

Although exciting, a comeback of immersive technologies also sparks concern. Immersive journalism is often deemed to be a way of regaining audiences and engaging them with journalistic content, but it is also possible that the opposite turns out to be the case, and news avoidance will increase with the implementation of immersive technologies in journalism. This article explores how news consumption using immersive technologies impacts news avoidance. First, immersive journalism and how it produces emotional content will be explained. Based on existing research, it will be argued that immersive journalistic content has the potential to speak to the emotions of the user to a higher degree than written journalistic content or content shown on a monitor does. Then, we will look at news avoidance and what

role emotions play in this process. Linking news avoidance and the high levels of immersion in immersive journalism results in the idea that high-emotional content in immersive journalism could increase news avoidance.

This idea was tested during a VR experiment, where participants were shown both high and low-arousal videos on either a 2D monitor or with a VR headset and then asked how likely they were to watch another video. By doing so, an emotional content saturation news avoidance scale was constructed and validated to measure how both high and low-arousal news content impacts the audience's intention to skip when consuming news using a VR headset. The research question central to this experiment is: "How does news content impact the audience's intention to skip when consuming news using a VR headset?"

The findings from this paper benefit future research and newsrooms considering implementing immersive technologies. Present-day technologies enable immersive storytelling more than they used to, with the emergence of the Metaverse and the Apple Vision Pro as tangible examples. These developments could indicate that newsrooms might start or proceed to experiment with immersive journalistic storytelling in the coming years. Experience from the mid-2010s shows that some changes need to be made to the production process of immersive journalism for it to remain successful over time and assure audience engagement. Looking at ways to make sure the audience does not avoid immersive content is a great starting point.

The Rise of Immersive Journalism

Immersive journalism can be described as the application of immersive technologies, such as virtual reality (VR) and 360-degree video, to enable the user interaction with a story and provide an immersive journalistic narrative (De Bruin et al, 2020). The idea of telling news stories in an immersive way dates back to the 1990s (Pavlik, 2013).

The idea was re-emerged when de la Peña et al. wrote about it in 2010 (de la Peña et al., 2010). One of the most important features of immersive journalism for de la Peña et al. was the role of presence in journalism and what virtually being present at a news event could mean. According to de la Peña, immersive experiences have a larger ability to enable the user to experience the scene as being present at the event themselves than text or video presented on a screen can (2010). De la Peña et al. also emphasize that the first-person sensory experience of an event, made accessible by immersive technologies, can heighten emotions (2010). Because

of this, de la Peña et al. argue that immersive journalism can offer a way for the public to understand the news in a profound way (2010).

The resurfacing of immersive journalism around 2017 is linked to an 'emotional turn' in journalism studies (Wahl-Jorgensen, 2020). According to Cheng and Verboord (2024), this emotional turn "highlights the inclusion of emotion across the production, texts, images and audience engagement in journalism" (p. 5). In journalism, including emotion is often looked at as being the opposite of striving for objectivity (Wahl-Jorgensen, 2020). Scholars argue that including authentic emotion is, however, necessary for news media's trustworthiness and can enable the shift away from 'traditional,' objective reporting that magnifies social power structures (Beckett & Deuze, 2016; Cheng & Verboord, 2024).

The potential of immersive technologies to present news stories in an innovative way was picked up by news organizations. In the mid-2010s, news organizations started experimenting with immersive technologies (Watson, 2017; Resendez, 2024). News outlets such as the *Des Moines Register*, *The Wall Street Journal*, *The Guardian*, and *The New York Times* started developing and testing news stories using immersive technologies. In 2015, *The New York Times* launched the mobile app 'NYT VR,' where users could experience immersive stories using headphones and optional cardboard VR glasses. Most of the news organizations experimenting with immersive technologies teamed up with Google or Samsung to expand VR operations (Cheng & Verboord, 2024). These tech companies enabled the fast-growing hype of immersive journalism because of financial support, support for developing immersive journalism in exchange for content, and because they provided news outlets with the equipment and software needed (Cheng & Verboord, 2024).

Despite initial expectations about the potential of immersive technologies for journalism, the hype of immersive journalism toned down after 2018 (Nielsen & Sheets, 2019). This was mainly due to challenges regarding the development and profitability of the use of immersive technologies. Developing and sustaining a subscription-based model to make revenue from immersive stories appeared to be challenging (Ilvonen et al., 2021). Apart from this, technological challenges such as the consumer take-up of headsets and high production costs also restricted the rise of the use of immersive technologies in journalism (Herrera Damas & Benítez de Gracia, 2021). When news outlets became less excited about developing immersive news stories because of the reasons mentioned, the tech giants cut down on financial support for immersive journalism (Cheng & Verboord, 2024). As a result, media companies rested on further major developments of immersive stories because they could not provide sufficient financial support for large-scale development themselves (Wu, 2023).

Although the immersive journalism hype faded out, Cheng and Verboord (2024) argue there are still media who are developing immersive news stories, "just like before the VR hype when tech giants got involved" (p.13). Reduced costs and faster production because of experience with producing immersive stories could also help immersive journalism make a comeback over time (Cheng & Verboord, 2024). However, challenges remain. Neither software nor hardware seems to be optimized to be applied on a large scale (Godulla et al., 2021). Concerns also exist about reaching audiences. Immersive journalism seems to be difficult to promote and is not sociable because the immersive experience is not easily shared (Cheng & Verboord, 2024). According to media practitioners that Cheng and Verboord (2024) spoke to, "news media need to better manage their expectations" towards immersive journalism (p.16). The goal is not to get every journalist to use immersive journalism, but to make sure it is a viable option for the future (Cheng & Verboord, 2024).

To keep immersive journalism a viable option, a better understanding of reaching audiences is needed. This understanding should be about how to promote the technology and how to make it a more sociable experience, as Cheng and Verboord (2024) mentioned. But it is also about better understanding how immersive technologies impact the audiences. According to de la Peña (2010), immersive journalism has the ability to enable the user to experience the scene as being present at the event themselves and eliciting emotional responses from the public. It is not unthinkable, however, that experiencing such emotions might not be pleasant all the time. To fully understand why the hype of immersive journalism did not make it the first time and why media outlets struggled to make revenue from their productions, it is important to look at the impact of immersive journalism on the audience experience's news consumption intentions.

Consuming Emotional Content

Immersive media are known for combining sensory experiences in an environment that is highly visual, auditive, and sometimes even tactile. In doing so, immersive journalism differs from textual journalism and other visual forms of journalism (e.g., photographs), where emotions are only evoked through text and more abstract visuals (Sundar et al., 2017). These affordances may have implications for the way the user relates to the story being presented (Sundar et al., 2017).

Apart from immersive journalism gaining interest from news outlets, it has also gained interest from scholars over the years. Several researchers have looked into immersive

journalism, its affordances, promises and implications. One of the main starting points for academic research is the idea that immersive journalism capitalizes on the rise of immersive technologies. These technologies enable system immersion (Slater, 1999). This kind of immersion refers to the practice where a device blocks out stimuli from the outside world and accommodates several sensory experiences (Biocca & Delaney, 1995; Slater, 1999).

In general, immersion is understood as the connection between the user and the virtual environment (Kukkakorpi & Pantti, 2021). When the user is more present in the virtual environment, it is expected that the user has more responsiveness to it and could experience the events more directly. The technological affordances of immersive journalism allow for stimuli from the outside world to be blocked out because of the use of VR glasses. This way, the user will only be surrounded by the images and sounds presented to them in the virtual environment. This can contribute to the feeling of immersion (Biocca & Delaney, 1995; Slater, 1999).

Another way to immerse the user in a virtual environment is by enhancing feelings of proximity (Kukkakorpi & Pantti, 2021). Proximity is about how close something is to home and the affective relationship a viewer has with a place. A story is expected to get more attention if there is more proximity. Feelings of proximity can be heightened by appealing to the emotions of the user (Kukkakorpi & Pantti, 2021). It is precisely these emotions that are being addressed by immersive storytelling.

When news outlets started to experiment with the application of immersive technologies, it was expected that immersive journalism would have a large impact on the news experience of users (Shin & Biocca, 2018). Immersive technologies are expected to create the sense of being present in the world being presented and allow users to experience stories as if they were there themselves (Decock et al., 2014). In a study by Sundar et al. (2017), users experiencing a story through 360-degree video were indeed found to have more feelings of being present at the scene where the story happened than users reading the same stories using only text with pictures. The ability to look around while watching a 360-degree video and exploring the scene increases feelings of interactivity (Sundar et al., 2017). This feeling of interactivity could trigger a feeling of being there, interaction, and realism.

Immersion situates a user within a story in such a way that the user may become more engaged with the narratives or events conveyed. This can be the case because even the most superficial stimuli can result in emotional reactions (Kensinger & Corkin, 2003). Media content contains a wide range of stimuli, like sounds or visual. All of these stimuli can elicit emotional reactions.

Daft and Lengel (1986) argue that the richer the media is in detail, the more the user will

experience a sense of presence. This media richness theory is supported by the notion of embodied cognition. Embodiment is about getting a tangible idea of what is happening through your senses (Shapiro, 2019). Embodied cognition argues that the brain and the body are connected to each other. Because of this, cognition is influenced by the physical sensations the body experiences (Varela, 2017). When a user feels more physically located in a story, the way they feel about a story will be influenced more by the media stimuli (Cummings et al., 2021). The idea of the embodied cognition hypothesis is that heightened feelings of being there and immersion in immersive journalism can result in the user adopting the emotions shown in the media content to a higher degree than with other ways of presenting the story.

An embodied experience can also increase feelings of empathy or compassion for the people being depicted in news stories (Sánchez Laws, 2020; McRoberts, 2017). Other research suggests that when media engage several senses, this could result in a higher emotional response and lead to a positive attitudinal change in users regarding how they feel about, for example, human rights topics (Ding et al., 2018; Bujić et al., 2020).

News Avoidance

Thus far, it has been established that immersive journalism has the potential to heighten emotion and enhance empathy. This sounds very promising, but it is good to note that research shows that emotions also play a big part in news avoidance (Villi et al., 2022).

News avoidance refers to when the audience consumes low levels of news over a continuous period. Research on news avoidance mainly focuses on ‘traditional’ news content, including news published on social media. Studies on avoidance brought by these media show that news avoidance can have several causes and can be unintentional or intentional (Skovsgaard & Andersen, 2020).

Unintentional news avoidance is due to changes in the broader media environment, such as a growing supply of media content (Damstra et al., 2023). The rise of social media and the overall change in the media environment comes with the possibility of the public not consuming all the items and still feeling well-informed. It has become easier to ‘opt out’ of news items you do not like because so many other items are on offer. This change in consumption happens without people actively choosing to consume less news (Skovsgaard & Andersen, 2020).

The reasons for intentional news avoidance are more complex than those for unintentional news avoidance. Intentional news avoidance happens when people consciously tune out because they do not like the news. This type of news avoidance can be driven by

cognitive or emotional drivers (Villi et al., 2022). Cognitive drivers refer to the repetition of exposure to news items, which can result in a sense of overload. This sense of overload can happen when there is a sense that there is too much news to keep up with (Park, 2019). This kind of news avoidance is likely to occur in the present-day media environment, where news stories are brought to the public by newspapers, television, radio, and social media. Immersive journalism could increase this kind of news avoidance by adding another medium that produces news content to the mix of existing media.

Emotional drivers can be the focus on negativity in the news or other emotional reactions to news items. Generally, news stories tend to focus on negativity and conflict (Harcup & O'Neill, 2017). This focus can be explained by the so-called negativity bias and the news values and framing that arise from this bias. The negativity bias involves people's tendency to focus on negative things happening (Soroka et al., 2019). It was an evolutionary function that helped us signal danger and survive. Nowadays, this evolution also draws our attention to things in the news that could indicate danger (Soroka et al., 2019).

The negativity bias is reflected in news values. The news selection process is often based on these news values, which are decisive measures for a journalist to determine if an event is newsworthy. Harcup and O'Neill (2017) compiled a list of news values often considered in present-day journalism. Most of the news values formulated by Harcup and O'Neill consist of news values that touch on negativity. Examples of such news values are bad news, drama, and conflict. Other news values such as surprise, good news and relevance seem to indicate that overall, stories containing high emotional content are more likely to be selected as newsworthy.

The trend of a large focus on negative events in news items is not unexpected when we think back to the negativity bias. Journalists look for negative news because this is where attention is drawn from an evolutionary point of view (Shoemaker & Reese, 2013). At the same time, stories about highly emotional events are also read more by the public because the negativity bias draws our attention to these news stories (Trussler & Soroka, 2014). Subsequently, reporters are expected to focus more on negative events in their news content because 'bad news sells'. This dynamic results in a news landscape dominated by coverage of negative or highly emotional events and reporting being framed to focus on negative aspects of a story. It would not be unthinkable for news outlets to adopt these news values when producing immersive news stories.

Research shows that this focus on highly emotional stories in journalistic practices may affect the mental well-being of news consumers (Boukes & Vliegenthart, 2017). This view is supported by Holman et al. (2014), who looked into news coverage of the attack at the Boston

Marathon in 2013. They found that it was not merely the witnesses present at the attack who suffered reduced mental well-being but also those who had kept up with news coverage of the attack. Repeated exposure to news coverage was even associated with higher stress levels than those being directly exposed to the attack. This might be a finding with problematic implications for audience engagement in immersive news stories since the focus of these stories is to make the audience feel as if they are present at the news event.

People generally strive for positive, balanced, effective states (Damasio, 2016). Avoiding the news can be a form of self-preservation where people try to prevent highly emotional sentiments associated with news items (Villi et al., 2022). The findings of Boukes and Vliegenhart (2017) and Holman et al. (2014) seem to indicate a correlation between following the news and reduced well-being. Eventually, the focus on negativity in the news can result in active avoidance of the news (Newman et al., 2019).

The crux here is that people seem to be able to process a certain degree of negative information or high emotional content (Moeller, 2002), but there is a maximum to it. Nowadays the public gets exposed to news content much more than before the rise of the internet and social media (Barthel et al., 2015; Karlsen et al. 2020). Being online all the time, having access to ever-evolving news stories on the internet, and receiving push notifications throughout the day are much different from turning on the television once or twice a day to watch the news highlights. This shift in the level of news consumption, paired with the general focus on highly emotional content and negativity in the news, seems to be a perfect recipe for news avoidance.

The Link Between Immersive Empathy and News Avoidance

In the late 2010s, immersive journalism was often thought of as a way to engage audiences in news outlets (Hendriks Vettehen et al., 2019). Considering the affordances of immersive journalism and research findings on news avoidance, this could be a questionable assumption.

This trend of optimism about immersive journalism's ability to engage audiences is also seen in research on this audience engagement in immersive journalism. The focus seems to be on the way immersive journalism can involve the public in news content, introducing them to worlds not ventured in an immersive way before. Research does indeed show that immersive journalism heightens engagement with news content (De Bruin et al., 2020). Heightened engagement with a news story could, in theory, counter unintentional news avoidance when thinking of immersive journalism as a more 'exciting' way of consuming news for the public, rekindling curiosity for news content.

Although immersive journalism might be effective in countering unintentional news avoidance, it is questionable how effective it will be when it comes to avoiding intentional news avoidance. Since immersive journalism adds new news items to the collection of already existing media content and, at the same time, offers another medium for the public to keep up with when staying on top of the news, the rise of immersive journalistic content could increase the cognitive driver of avoiding the news.

Immersive journalism could also impact the emotional driver for intentional news avoidance. Earlier in this paper, it was established that immersive journalism allows for empathic engagement with the topics being presented, heightening the audience's sense of presence in the story and speaking to the senses more (Decock et al., 2014; Van Damme et al., 2019; Sundar et al., 2017; Ding et al., 2018). This could also mean that a larger appeal is made to the emotions of the public (Kukkakorpi & Pantti, 2021). It is exactly this appeal that could impact the emotional driver for intentional news avoidance, resulting in the public possibly avoiding immersive journalistic content.

To better understand how immersive journalism could lead to intentional news avoidance, it is interesting to note that an important part of immersion is social engagement. Emotions can connect a story to a distant audience (Lecheler, 2020). Through embodied cognition, feelings of proximity can be fostered (Kukkakorpi & Pantti, 2021). Studies also show that immersive experiences can result in a higher level of emotional empathy for the story being presented (Pimentel et al., 2021).

This idea is supported by both Jones (2017) and Kukkakorpi and Pantti (2021). They looked into the experience of the proximity of the audience to the scene being shown in immersive journalism. Both express concerns about personal space. They argue that proximity in VR journalism can have a downside because it could cause discomfort to the audience. This is closely related to Jones's feelings of invasion of personal space. It could well be that certain feelings result in a news consumer becoming avoidant of such immersive journalistic experiences. According to Kukkakorpi and Pantti (2021), it is about the audience's emotional connection with the story. Distance in a story can lead to distrust or distraction, resulting in a lack of emotional connection. At the same time, a high level of emotional immersion raises ethical concerns when dramatic media content is used to enhance empathy. What needs to be looked for is “proper distance” (Kukkakorpi & Pantti, 2021, p. 787).

There are also scholars who counter the idea that immersive experiences lead to higher empathy (Resendez, 2024). Resendez (2024) points out that both Wu et al. (2021) and Steinfeld (2020) found little difference in empathy between watching news on a monitor or in and

immersive setting. Greber et al. (2023) found similar results. However, they also found that the first-person narrative perspective did, in fact, affect positive emotions, as did the degree of interactivity experienced. What is interesting is that the effect on positive emotions seemed to differ between participants. Greber et al. (2023) found that the impact on emotional engagement was dependent on how empathic participants tended to be. Because of this, an immersive experience and the additional interactivity with a news story can be intense and overwhelming for participants with higher levels of empathy (Resendez, 2024). Participants with lower levels of empathy might experience it as less intense or even find immersive stories compelling because they get immersed in the subject matter (Resendez, 2024). Overall, positively or negatively overstimulated audiences both seem to not be something to strive for. Research shows that for overstimulated audiences, the information presented in the video is processed less, and information recall is decreased (Resendez, 2024). This applies to both users who enjoy watching immersive news stories and users who feel emotionally overwhelmed watching them. According to Resendez (2024), these findings suggest that news outlets should be careful not to overstimulate the user and look for a balance between eliciting engagement and the potential of the content having a negative impact on emotions or information recall.

Methodology

Study Design and Stimulus Material

This study implements a two-factorial between-subjects experimental design. The experiment includes four conditions, where the news avoidance of participants watching either high or low-arousal news videos on a 2D monitor is compared to the news avoidance of participants watching the same high or low-arousal news videos in VR. Participants were randomly assigned to one of the conditions. The study was approved by the ethics committee of the Faculty of Humanities at Leiden University.

Ten existing 360-degree videos of the New York Times, initially designed for the mobile app NYT VR, were selected as stimuli. The New York Times videos were selected because the videos were produced by a renowned news outlet, ensuring that the videos can be labeled as ‘news videos.’ The large number of 360-degree videos produced by the New York Times allowed for a selection including both high-arousal and low-arousal videos. The videos were all designed in a similar way, often containing either subtitles or a voice-over. This was important to make sure changes in the video design were not a reason for the participants to

want to keep watching.

Five videos were selected for the high-arousal groups (both VR and 2D), and five different videos were selected for the low-arousal groups (both VR and 2D). The videos were on different topics to make sure issue fatigue was not a reason for participants to want to stop watching. The 360-degree videos of the New York Times were transformed into 2D videos using ffmpeg, Premiere Pro, and Insta 360 Studio.

For all conditions, negative valence videos were chosen. These videos reflect the negativity bias that is present within the present-day news industry, which is often seen as a driver for news avoidance (Harcup & O'Neill, 2017; Soroka et al., 2019). Both high-arousal and low-arousal videos were included.

The videos shown to the groups watching high-arousal news videos differed from the videos shown to the groups watching low-arousal news videos. A detailed description of the characteristics of the videos can be found in Appendix 1. The main difference between the videos is that the high-arousal news videos contained high-arousal content, which is known to trigger highly emotional reactions such as being scared or happy (Posner et al., 2005; Russell, 1980). The low-arousal news videos contained low-arousal content, known to trigger less intense emotional reactions such as being sad (Posner et al. 2005, Russell, 1980). Including high and low-arousal videos in the experiment makes it possible to test if the emotional reactions to high-arousal videos are indeed stronger and to investigate whether these feelings impact news avoidance.

These four conditions help to investigate how news content impacts the audience's intention to skip when consuming news using a VR headset. The impact of high emotional news on news avoidance is tested by comparing the high arousal and the low arousal condition. The impact of the VR modalities on news avoidance is tested by comparing the VR and the 2D condition.

Each video was approximately 1:30 minutes in length to ensure the difference in length was not a reason for skipping. Although little research on the long-term effects of VR exists, researchers expect it could cause digital eye strain (Hirzle et al., 2022). To prevent this from happening, the amount of time participants wore VR glasses during the experiment was kept to a minimum.

The videos were shown on Oculus Rift VR glasses and a Lenovo computer monitor. An emotional content saturation news avoidance scale was used to measure skip intention. This scale is based on previous research by Fonseca and Kraus (2016) and the figures constructed by De Bruin et al. (2021). The emotional content saturation news avoidance scale used for this

paper shows how many percent of the participants are unlikely to want to stop watching after each video, depending on the kind of high- or low-emotional videos shown. The emotional content saturation scale includes the results from both the VR and 2D high-arousal videos, known to be high emotional content, and the VR and 2D low-arousal videos, known to be low emotional content.

Procedure

When entering the lab, participants completed a questionnaire that contained questions about their demographics, prior experience with VR, and general news consumption. Participants also filled out a consent form to give consent for their data to be used in the experiment. After, they were randomly assigned to one of the four experimental conditions and given a short instruction on the experiment. Then, the video sequence was started. In between videos, participants were shown a still frame with the question, "How likely are you to want to watch another video on a scale of 1 (very unlikely) to 5 (very likely)?". After the videos ended, participants completed a second questionnaire that contained questions on how much they liked watching the videos overall, how they felt during each individual video, and if they felt present at the scenes or if there was a point where they wanted to stop watching the videos. Finally, participants were debriefed. All analyzed data was collected anonymously. A detailed description of the procedure can be found in Appendix 2.

Measurements

In this experiment, the aim was to gain an understanding of the news avoidance of the participants. To gain an understanding of this, we measured skip intention. Novelty (prior VR experience) was also measured to find any correlations between these variables and news avoidance. Additionally, participants were asked if they felt present at the scenes presented to measure whether the participants felt immersed or not. Questions were also asked about overall video enjoyment and feelings while watching a video to gain some context as to why participants wanted to skip a video. The scales used were made ad-hoc, except for the skip intention measure which was based on Fonseca and Kraus (2016) and the novelty measure which was based on Wehden et al. (2021). An overview of measurements is provided in Appendix 3.

Sample

Participants were mainly recruited at a Dutch university through mailing lists and flyers. Overall, 62 persons completed the pre-questionnaire and visited the lab. The results from one participant had to be removed from the final data set as they got dizzy throughout the experiment and did not complete the experiment. Therefore, the final sample consists of N=61 participants. Participants were distributed evenly between the conditions.

The participants were relatively young (M= 26,9, Min.=18, Max.=69) and highly educated (highest educational degree: 82% university; 8,2% HBO; 1,6% MBO; 8,2% secondary school). Female participants were over-represented (59% female; 39,3% male; 1,6% X).

The majority of the participants had no to little prior VR experience (19% had no prior experience; 50,8% had tried on a VR headset before, but that was it; 18% had used a VR headset a few times).

Data analysis

The data from the experiment was analyzed by comparing the multiple-choice response rates. Cross-tabulation was used to quantitatively analyze the relationship between multiple variables. Analyzing the data this way allows for an emotional content saturation scale to be constructed and to compare the results of participants with and without prior VR experience.

In the following sections, the results from the experiment are presented. The aim is to examine how watching news videos in an immersive setting impacts the skip intention of participants and what factors play a key role in the process of news avoidance.

Results

Skip Intention

Analyzing the data using cross-tabulation shows that skip intention is highest among those consuming news videos on a 2D monitor. These results are visualized in an emotional content saturation scale (see Figure 1). By video 5 (V5), especially those watching 2D low-arousal videos are unlikely to want to watch another video (2D high arousal: 46,7%; 2D low arousal: 60%). The number of participants unlikely to want to watch another video after V5 is lower in those watching news videos in VR (VR high arousal: 40%; VR low arousal: 25%).

The ‘tipping point’ for all participants to become less likely to want to watch another

video appears to be video 3 (V3). The percentage of participants that are unlikely to want to watch another video goes up for those watching VR high arousal, 2D high arousal and 2D low arousal. The percentage stabilizes for those watching VR low arousal.

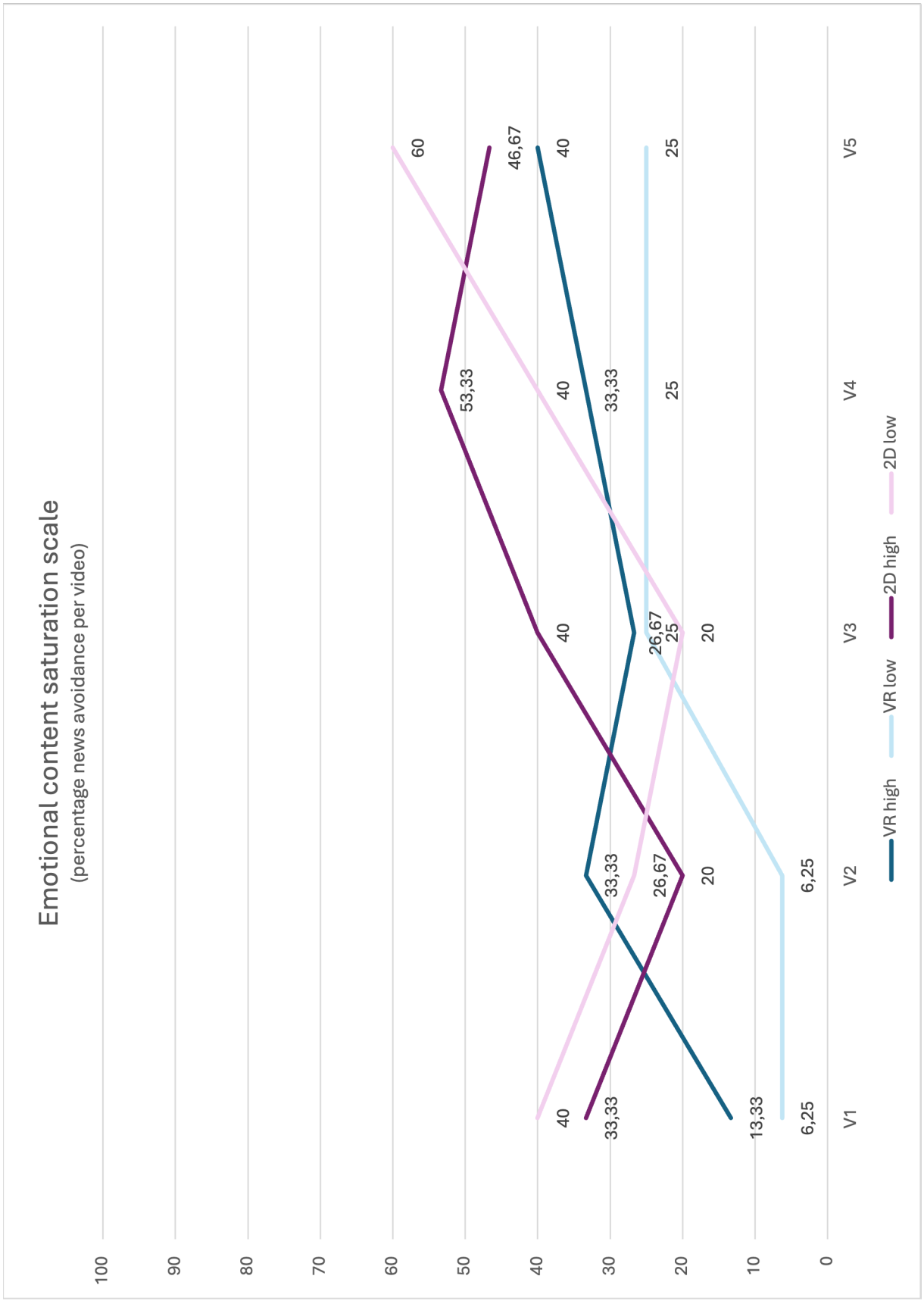

Figure 1. Emotional content saturation scale

Arousal

Participants consuming high arousal news videos in VR tend to be unlikely to want to keep watching to a larger degree, than those consuming low arousal news videos on VR (see Figure 2). This distinction is rather small when the participants start watching the videos (V1: high arousal = 13,3%; low arousal = 6,3%). The percentage of participants that are unlikely to want to watch another video grows when participants watch for a longer period (V5: high arousal = 40%; low arousal = 25%).

The opposite appears to be the case for participants watching 2D news videos (see Figure 3). Initial differences between participants watching 2D high arousal and 2D low arousal are smaller (V1: high arousal = 33,3%; low arousal = 40%). These differences remain stable throughout the video sequence (V5: high arousal = 46,7%; low arousal = 60%).

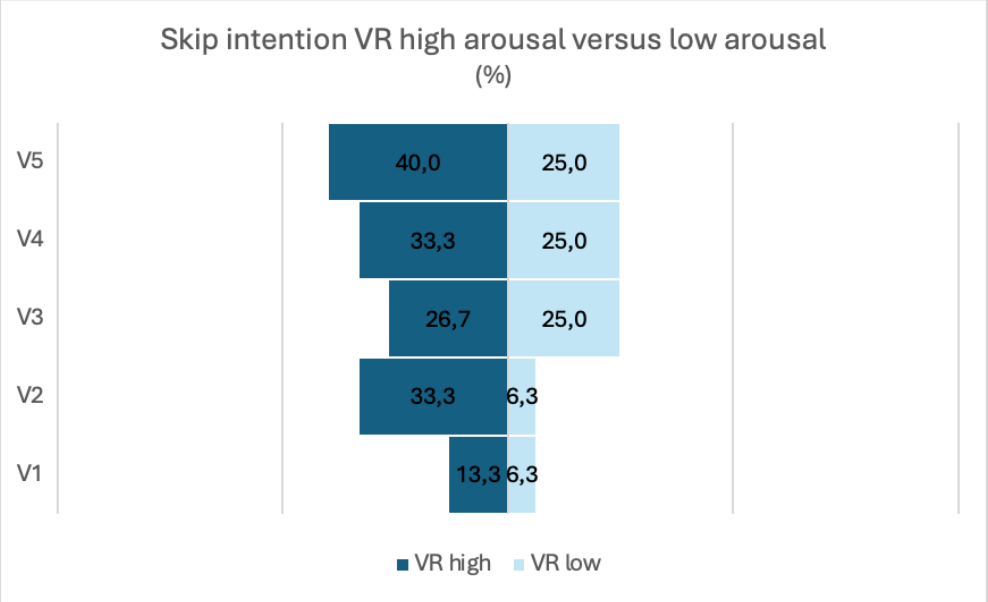

Figure 2. News avoidance VR high arousal versus low arousal

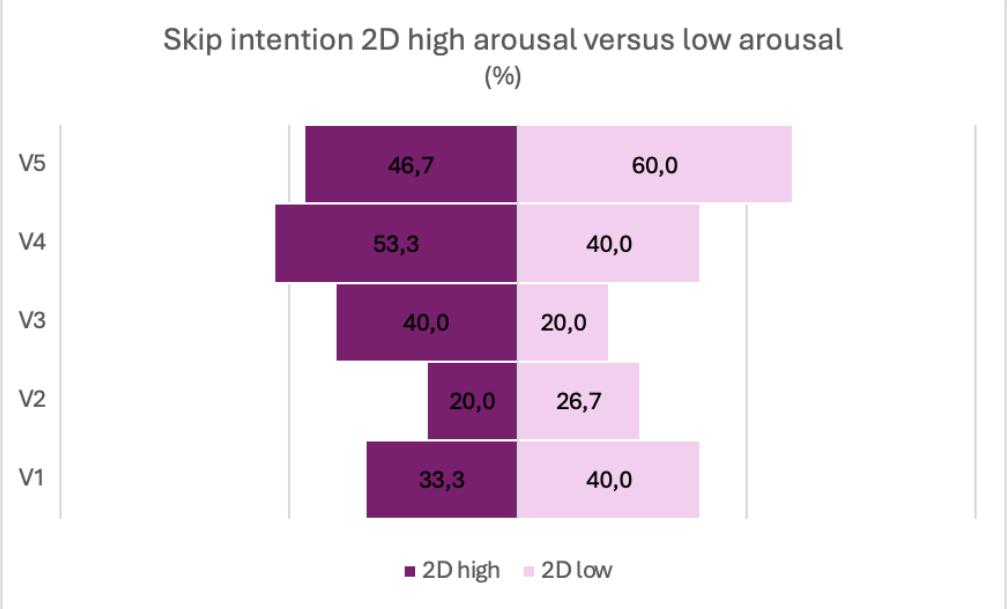

Figure 3. News avoidance 2D high arousal versus low arousal

Novelty

To decide how novelty impacts news avoidance, it is interesting to analyze the metric of skip intention at regular intervals (per video). Looking at the difference in the percentage of the participants that are unlikely to want to watch another video between V1 and V5 (see Figure 1) shows that the percentage of participants that are unlikely to want to watch another video grows fastest among those watching in VR (difference between V1-V5: VR high arousal = 26,67%; VR low arousal = 18,75%; 2D high arousal = 13,34%; 2D low arousal = 20%).

Dividing the participants' group that said they were unlikely to want to watch another video based on their prior VR experience gives an overview of the differences in news avoidance between these groups. The increase in the percentage of participants that were unlikely to want to watch another video developed quite similar for both participants with prior VR experience watching VR high-arousal videos and those watching VR low-arousal videos (see Figure 4). Both groups started out with a similar percentage of participants being unlikely to want to watch another video (9,1% for both groups. After V5, those watching high-arousal videos on VR were less likely to want to watch another video (36,4%) than those watching low-arousal videos (27,3%).

The percentages of participants without prior VR experience who were unlikely to want to watch another video developed less organized (see Figure 5). Those watching low-arousal

videos only started to want to avoid the videos after video 2, with numbers stabilizing for V3, V4, and V5 (20%). The percentage of participants who are unlikely to want to keep watching without prior VR experience watching high-arousal videos started off with a quarter of the group already wanting to stop after V1 and 100% of the participants wanting to stop after V2. These numbers dropped after V3 (50%) and V4 (25%) and increased again after V5 (50%).

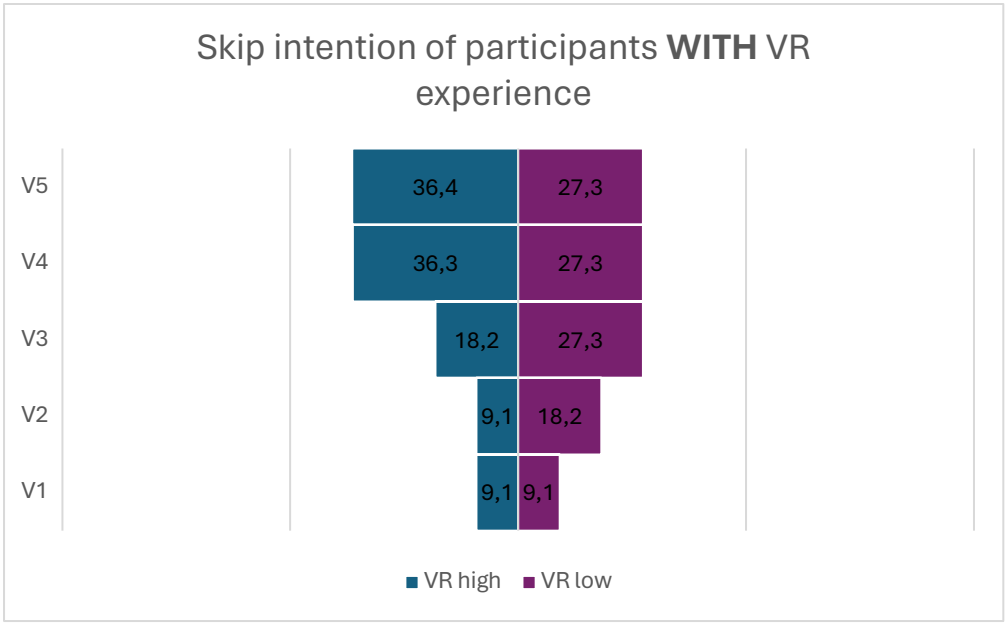

Figure 4. News avoidance of participants with VR experience

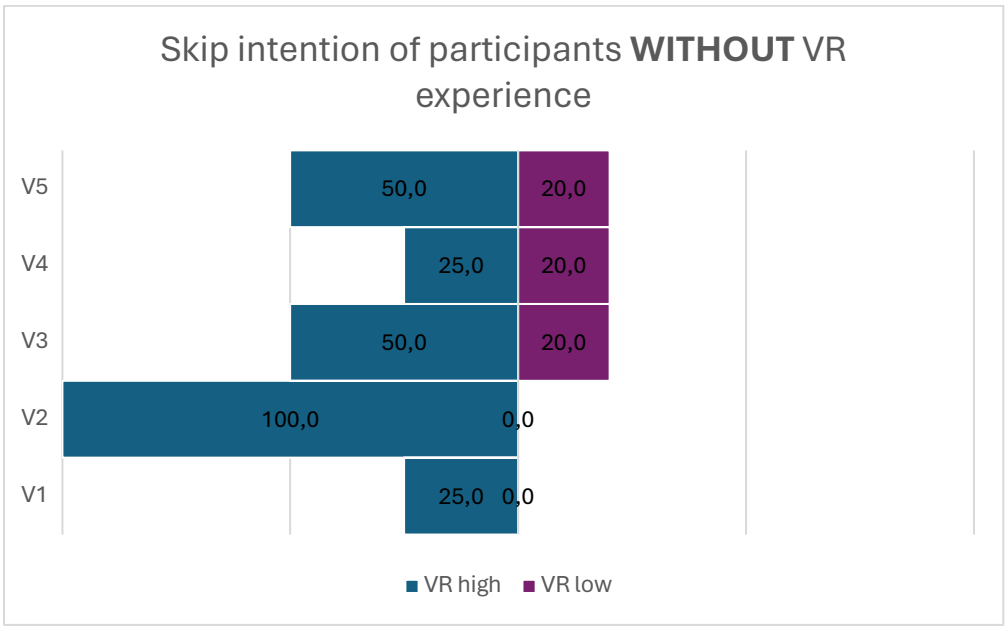

Figure 5. News avoidance of participants without VR experience

Feelings of Being Present

In general, participants watching the news videos in VR more often felt present at the scenes presented (feelings of being present: yes = 19). The opposite goes for the participants watching the news videos in 2D (feelings of being present: yes = 7). The biggest difference is to be found between the groups watching high-arousal videos in VR and those watching the same videos in 2D (VR high arousal: 13 felt present; 2D high arousal: 2 felt present). An overview of feelings of being present is given in Table 1.

	G1	**G2**	**G3**	**G4**
	VR high arousal	*VR low arousal*	*2D high arousal*	*2D low arousal*
Yes	13	6	2	5
No	2	10	13	10

Table 1. Feelings of being present

Overall Video Enjoyment

Participants watching the news videos in VR overall enjoyed the videos most (VR high arousal: 12 liked it; VR low arousal: 15 liked it). The opinions of those watching on 2D were more scattered (2D high arousal: 7 liked it; 2D low arousal: 4 liked it). An overview of overall video enjoyment is given in Table 2.

	G1	**G2**	**G3**	**G4**
	VR high arousal	*VR low arousal*	*2D high arousal*	*2D low arousal*
1 – *I really did not like it*	1	1	1	0
2 – *I did not like it that much*	1	0	6	6
3 – *neutral*	1	0	3	2
4 – *I liked it*	9	11	4	5
5 – *I liked it a lot*	3	4	0	2

Table 2. Overall video enjoyment

Feelings While Watching

Out of the participants stating they were unlikely to want to watch another video, all groups felt different emotions while watching the video after which they noted they wanted to stop

watching. Those watching VR with high arousal felt mostly neutral (8) or sad (6). Participants watching VR with low arousal felt mostly neutral (12).

Participants watching 2D high arousal felt mostly sad (14), just like those watching 2D low arousal (neutral: 15; sad: 9). Those stating they felt "none of the above" answered they felt bored, interested, confused/annoyed about where to find the text in VR, compassionate, empathetic, anxious, intrigued or angry. An overview of the feelings experienced while watching the videos is given in Table 3.

	G1	**G2**	**G3**	**G4**
	VR high arousal	*VR low arousal*	*2D high arousal*	*2D low arousal*
Scared	2	0	5	1
Sad	6	1	14	9
Neutral	8	12	7	15
None of the above	6	3	2	2

Table 3. Feelings while watching the videos

Reasons to Want to Stop Watching

Overall, 21 participants answered the question, "Was there a point throughout the experiment where you wanted to stop watching?" with "Yes." An overview of how many participants indicated they wanted to stop watching is given in Table 4. The reasons for and moments when participants declared to want to stop watching varied between participants.

Some participants gave context as to why they wanted to stop watching. For the VR high arousal group, one participant said they wanted to stop at videos 2-3 because they "did not know if these kinds of horrible movies would continue." Another participant pointed out that the modalities of VR were a reason to want to stop watching: "Had to look for written comment which made it difficult to enjoy the VR experience itself because I was very busy reading." No reasons for wanting to stop watching were reported for the VR low arousal group.

For the 2D high arousal group, a participant pointed out that being bored was a reason for wanting to stop watching: "The video about the camp in Calais was a little boring so I'd probably stop watching there". Another participant of the same group pointed out that they wanted to stop watching because "some shots did not show anything".

For the groups watching 2D low-arousal videos, a participant reported they wanted to stop "when the sound was too harsh (ex-wind, overlapping voices)". Another participant noted: "Following text and video made me want to stop watching."

	G1	**G2**	**G3**	**G4**
	VR high arousal	*VR low arousal*	*2D high arousal*	*2D low arousal*
Yes	4	2	9	7
No	11	14	6	8

Table 4. Participants indicating they wanted to stop watching at some point during the video sequence ("yes").

Discussion

In the literature review, it was argued that it is not unthinkable that VR increases news avoidance when immersing the viewer in high-arousal, highly emotional news videos. The results of this study suggest that the overall number of participants wanting to avoid news videos is lower for those consuming news videos in VR than those watching in 2D. The percentage of participants being unlikely to want to watch another video overall was highest for those watching 2D high-arousal videos. Numbers also went up at the end of the video sequence for those watching 2D low arousal.

However, when looking at the overall increase in the number of people who are unlikely to want to watch another video between the start and the end of the video sequence, the results suggest that news avoidance increases the most during the sequence for those watching high-arousal videos in VR.

Comparing the skip intention of those watching videos in VR with prior VR experience to the skip intention of participants watching videos in VR without prior VR experience suggests that novelty might be impacting the skip intention of those watching news videos in VR. What is also interesting is that of the participants without VR experience being unlikely to want to watch another video, 100% wanted to stop watching after V2. In the setting of the experiment this did not lead to immediate news avoidance because participants had to finish the entire sequence. But would the participants have been watching at home, being able to stop watching at any given moment, the results suggest that all of them would have stopped after V2. This insinuates that participants watching VR high-arousal videos experience some kind of 'shock' moment when watching high-arousal VR videos for the first time. This shock moment gets less after V3 but returns to 50% of the participants watching VR high-arousal videos without prior VR experience being unlikely to want to watch another video, compared to 36,4% of the participants with prior VR experience.

The percentage of participants watching the same high-arousal videos with prior VR

experience being unlikely to want to keep watching is much lower (9,1%) compared to those without prior VR experience and similar to the overall percentage towards the end of the sequence (with experience: 36,4%; overall: 40%). The 'shock' moment is also not recognized in the difference between participants watching VR low-arousal videos with or without prior VR experience. Participants watching VR low-arousal videos without VR experience initially all want to keep watching after V1 and V2, with numbers increasing to 20% being unlikely to want to keep watching after V3.

Since VR is a new experience for a lot of people, these findings suggest that it is important for news consumers to get accustomed to the immersiveness of the medium by watching either low-arousal videos or a mix of high and low-arousal videos. Those with prior VR experience were able to handle the high-arousal videos better than those without VR experience, suggesting that in the long run, high-arousal videos could also be shown without everyone wanting to stop watching.

For those watching VR low-arousal videos with VR experience, the percentage of participants unlikely to want to keep watching is slightly higher than the overall percentage of participants watching VR low-arousal videos being unlikely to want to watch another video. This could indicate that news avoidance is slightly increasing among those watching VR low-arousal videos when they have watched it several times before. Further research would have to show whether this is really the case. The same goes for the overall increase in the number of people that are unlikely to want to watch another video between the start and the end of the video sequence that was noticed. Testing participants for a longer period and showing them more videos could give insight into whether the trend of increasing news avoidance between the last and the first video continues.

Although participants were not directly asked about their motivations for being unlikely to want to keep watching, some participants did give feedback on this when asked if there was a point during the sequence where they wanted to stop watching.

It was noted that participants watching 2D videos who said there was a point in the experiment when they wanted to stop watching often said being bored or the video's design were reasons for them not to want to continue watching. This corresponds with the idea that distance in a story can lead to distraction (Kukkakorpi & Pantti, 2021). Seeing a dead body or hearing gunshots were also reasons for people to want to stop watching.

Those watching VR videos gave similar reasons for wanting to stop watching, but no remarks were made about being bored. The lack of feelings of being bored could be due to the immersiveness of the VR videos. Of the participants watching VR low-arousal videos, only one

participant actively said they wanted to stop watching. This implies that watching low-arousal content on VR could be more engaging than watching the same content in 2D.

When it comes to overall video enjoyment, participants watching in VR enjoyed the videos more than those watching in 2D. This could be due to it being a novel technology for most participants, which could cause them to focus more on the VR experience than on the content being shown. De Bruin et al. (2020) suggest that immersive journalism heightens engagement with news content. Because of this, immersive journalism could counter unintentional news avoidance when thinking of immersive journalism as a more 'exciting' way of consuming news for the public, rekindling curiosity for news content.

Although immersive journalism might be effective in countering unintentional news avoidance, it remains questionable how effective it will be when it comes to avoiding intentional news avoidance. Most of the participants watching the videos in VR stated there was a moment in the sequence where they felt present at the scenes presented. The number of feelings of being present was much lower for those watching in 2D. This corresponds to the idea of De la Peña (2010), who argues that immersive experiences have a larger ability to enable the user to experience the scene as being present at the event themselves than text or video presented on a screen can. Shapiro (2019) and Cummings et al. (2021) argue that heightened feelings of being there can result in the user adopting the emotions shown in the media content to a higher degree. This does not seem to be the case for the participants watching high arousal VR content. These participants felt scared or sad less often than participants watching the same content in 2D, despite 2D participants feelings less present at the scenes presented.

According to several scholars, heightened feelings of being can allow for empathic engagement with the topics being presented (De la Peña, 2010; Decock et al., 2014; Van Damme et al., 2019; Sundar et al., 2017; Ding et al., 2018). This could also mean that a larger appeal is made to the emotions of the public (Kukkakorpi & Pantti, 2021). It is exactly this appeal that could impact the emotional driver for intentional news avoidance, resulting in the public possibly avoiding immersive journalistic content. Results on how participants were feeling while watching both 2D and VR news videos give an insight into whether immersive journalism counters or increases intentional news avoidance. Out of the participants stating they were unlikely to want to watch another video, those watching 2D high-arousal videos felt sad or scared more often than those watching high-arousal VR videos. The same goes for participants watching 2D low-arousal videos. This is interesting since it contests existing literature and research that VR has the potential to heighten emotion and enhance empathy (Sánchez Laws, 2020; McRoberts, 2017; Pimentel et al., 2021). The opposite seems to be the case for the

participants of this experiment. It is hard to tell why exactly this is the case, but it could have to do with either novelty or empathy.

Novelty could be a factor since participants are used to watching 2D content and how to engage with the topics presented this way. This is most often not the case for VR, which could result in the participants engaging more with the medium itself than with the topics shown. This idea is enhanced by the findings that those watching VR enjoyed the experience more, although being shown high-arousal videos and being surrounded by the action. This could change once participants have watched VR for a longer period.

Empathy could also be a factor explaining these results. Resendez (2024) argues that an immersive experience and the additional interactivity with a news story can be intense and overwhelming, mostly for participants with higher levels of empathy. Participants with lower levels of empathy might experience it as less intense or even find immersive stories compelling because they get immersed in the subject matter (Resendez, 2024). In the experiment conducted for this paper, the participants did not exhibit empathic tendencies. It could be possible that participants watching on VR happened to have lower levels of empathy, which could influence the results. watching."

Conclusion

This paper explored how news consumption using immersive technologies impacts news avoidance. The study of the impact of VR on news avoidance was approached by examining skip intention. Based on the results, it can be argued that immersive journalism has the potential to counter unintentional news avoidance but is not instantly effective in countering intentional news avoidance.

Novelty appears to be a important factor impacting the skip intention of those consuming news in VR. High-arousal videos in VR being shown to people without prior VR experience could result in them avoiding these news videos to a large degree. Letting the audience get accustomed to immersive journalism by showing them low-arousal videos is advised to prevent a 'shock' moment.

Although results show that skip intention and, therefore, news avoidance overall is highest among those watching 2D news videos, skip intention increases most between the start and end of the video sequence for those watching VR news videos. This suggests that watching news videos in VR initially engages the audiences to a higher degree and makes them become

bored less fast, but that skip intention grows over time. This idea is supported by participants who have stated that they enjoyed the VR experience despite being shown distressing content. This suggests that immersive journalism could be an interesting medium to (re)engage participants with news content. However, this paper also agrees with earlier work by Resendez (2024), who argues that news outlets should be careful not to overstimulate the user. A mix of low- and high-arousal videos needs to be looked at to engage the audience but not 'shock' them, which could result in news avoidance.

The results are not without limitations. For instance, the methodology where participants had to watch the entire video sequence and were not able to stop watching when they felt like they wanted to is not similar to real-world scenarios where people can decide to put down their phone, close the news app or take off the VR glasses when they have had enough. Asking participants if there was a point when they wanted to stop watching and only a lower number of participants answering "yes" rules out that participants being unable to stop watching influenced the results to a large extent.

A further limitation is that the distribution of participants with and without VR experience is also not balanced. Most participants had some VR experience, only a third of the participants had not used a VR headset before. This could impact the interpretation of the results. Further research with balanced participant numbers is advised to test the idea that novelty might impact skip intention.

Another limitation is that participants self-reported how they felt while watching the videos. No physiological measurements were made to test whether they might have had emotions they did not recognize themselves. Adding these measurements in future research could make it possible to recognize emotions of being sad or scared in an earlier stage before these emotions are recognized as feelings.

Future researchers are encouraged to focus on the reasons why people feel like skipping VR news videos, including examining the impact of the empathic tendencies of participants in both the 2D and VR conditions. Some possible questions include: What are the reasons for people consuming immersive journalism to want to stop watching? How do the empathic tendencies of people influence their avoidance of immersive news stories? Other aspects that need to be addressed in future research are the length of the video sequence and the impact of novelty when consuming and avoiding immersive journalism. The results from this paper suggest novelty impacts news avoidance and people consuming VR news stories increasingly feel like avoiding the news stories when watching for a longer period. Examining how news

avoidance develops when the novelty wears off could give insight into whether showing people VR news stories is effective in countering news avoidance in the long run.

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Appendix 1. Video Characteristics

High Arousal

	Video 1	Video 2	Video 3	Video 4	Video 5
Title	The Fight for Falluja	Ghost Fleet	Enter the Chaos of Duterte's Philippines	'Jungle' on Fire: Migrant Camp Destroyed	Recalling the Horror at the Bataclan
Length	1:25 min.	1:31 min.	1:23 min.	1:15 min.	1:23 min.
What happens?	We enter the story in a desolate landscape, where we join a militia that is getting ready for battle. Later, fighting starts. We hear shooting. In a new frame, tanks roll in. The voice-over tells us how ISIS is an enemy that is nearby in Falluja.	We enter the story at a market. In the next frame we get introduced to the narrator. He tells us about his journey to being sold into slavery. While he tells the story, we witness the surroundings of the scene he tells us about. We see a market, containers and the boat where he worked and slept.	We enter the story at a crime scene. We see photographers who are taking photographs of a dead person laying under a bridge. In the next scene we see someone laying in a casket. We join his wake while people mourn over him.	We enter the story amidst a fire raging, burning down what look to be tents. There are people running around us. In the next frame, we are surrounded by cops and later we witness people in safety vests tearing down a tent. The video ends with a frame where we see makeshift tents surrounded by smoke.	We enter the story at the front of the Bataclan, cordoned off with a fence. We see people passing the scene. The voice-over, a journalist living near the Bataclan, gets introduced. We hear the sounds that he recorded during the attack. The journalist also describes the scenes to us. In the next frame, we see his view from his apartment, through which he could see the attacks. In the final frame, we are on the streets near the Bataclan, that are empty. At the same time the journalist tells us about the desolate scene

					after the attacks and the "terrible silence" afterwards.
Voice-over	Yes. We hear the English voice-over off a war photographer who joins the militia. He tells us what is happening and gives context to the fighting.	Yes. We hear the English voice-over off a man who was sold into slavery. He tells us how that happened and how it was to live and work on a fishing boat.	Yes. We hear an English-speaking New York Times correspondent who tells us what we are seeing and gives us context about the scenes being displayed.	No.	Yes. We hear the French voice-over off the journalist who witnessed the attacks from his apartment. He tells us about the events and about the bodies lying on the streets, the desolate landscape and silence after the attacks.
Subtitles	No.	No.	Yes. They mostly overlap what the voice-over is telling us.	Yes. A subtitle tells us where we are at the beginning of the video. Later, a subtitle tells us that a fire is raging in a migrant camp during its demolition. Another subtitle tells us why the camp is dismantled and what this means to the previous camp residents.	Yes. A subtitle tells us where we are at the beginning of the video. Later, a subtitle tells us whose voice we are hearing. The subtitles than continue to translate what the French voice voice-over is saying into English.
Sounds	We hear the wind blowing into the microphone, the voices of the men in the militia in an unidentified language. We hear gunshots and the loading of guns. We	We hear a market, vendors talking. These sounds are accompanied by oriental sounding music. While the story continues, we hear impending music, accompanied by the	We hear distant voices and the rumors of people gathering. We hear some coughing. We hear a road in the distant. When we see the coffin, we hear talking in an unidentified	We hear the crackling of fire, footsteps of people running, the wind blowing into the microphone and distant voices and distant clamor in both French and an unidentified language.	We hear traffic passing by. Then, when the French speaking voice-over starts speaking, we also hear screaming and shouting in French. We hear sirens in the background. When the

	hear tanks rolling in. In the background, impending music is playing, that is getting louder at the end of the video.	sound of someone knocking on a door. We hear a container door being opened. Once on the boat, we hear a boat engine, accompanied by slow piano music tones. Towards the end of the video, the impending music plays in the background.	language and some distant cries.	We also hear the peeping sound of a work vehicle and hammering at a makeshift structure.	voice-over talks about the bodies on the streets and wounded people, we hear gunshots and continuous shouting. Then, when the voice-over tells us about the silence afterwards, the shouting fades away and all that we hear is the sound of traffic passing in the distance.
Perspective	We experience the video as if we are accompanying the war photographer and witness what he is seeing. This is enhanced by the camera being at eye-level throughout the video.	We experience the video as if we are accompanying the man while he makes his way to the boat and whilst he is on the boat. This is enhanced by the camera being at eye-level throughout the video.	We experience the video as if we are accompanying the correspondent at the scenes he tells us about. As if we are on his shoulder, moving with him while he takes us to several places. This is enhanced by the camera being above eye-level throughout the video, more like we are looking a bit down on the scenes.	We experience the video as if we are present while the events are unfolding. This is enhanced by the camera being at eye-level throughout the video and the events unfolding around us, with people running around us. There is one moment where a police officer looks directly at us.	We experience the video as if we are reliving the experience off the journalists, mostly through the sound fragments. We are situated at his point of view during the attack. So, both in front of the Bataclan, in his apartment window looking down on the streets and on the streets ourselves. A woman passing by looks at us once and keeps looking at us while she passes by.

Low Arousal

	Video 1	Video 2	Video 3	Video 4	Video 5
Title	Relics of the Gulf War	A Family's Journey Home To Afghanistan	Seaside Solace In An Ocean Of Pain	Sleeping on Denver's Bitter Cold Streets	In Sweden, Tribute To Victims of Truck Attack
Length	1:20 min.	1:25 min.	1:24 min.	1:39 min.	1:23 min.
What happens?	We enter the story in a desolate landscape. During the video we roam around the ruins of a war on Failaka Island. We see bullet-riddled buildings and remains of vehicles and machinery used during the fighting. We also enter a building, where we encounter pigeons and a man.	We enter the story at the street, where trucks gather, and people walk around. Then, we accompany a few men who register for financial support in a tent to return to Afghanistan. Later, we watch people load a truck and them driving away on top of that truck. We follow them for a while, while they drive along a road.	We enter the story on a boat, where a man paddles us onto the sea. We get to know the surroundings, looking under a pier. We also meet the wife of the voice-over at the docks, and we join her while she works at a small restaurant at the beach. At the final shot, we are out on the sea, looking back at the beach while the boat we are in bounces up and down on the water. During the video, the couple explains what the ocean and the beach mean to them, after their daughters have passed.	We enter the story at an encampment on the streets. We see tents, bikes and clothing laying around. In the next frame, we see the same scene but during wintertime, when there is snow. We meet one of the people living in the encampment in her tent, while she is making a fire. Later, we meet a group of men who gather around another fire and talk about the situation with the sweeping of homeless people's encampments. The last frame is of a man sleeping in a tent. We can see the snow in his tent.	We enter the story amongst a group of people, silently listening at a vigil. In the next frame we see a makeshift memorial, made off a wooden wall, with notes written all over it. In front of the wall there are flowers and people taking pictures of the scene. In the next frame we see many flowers, with Swedish flags in between. We also see an elderly couple place flowers on a police vehicle. At the final frame we are back amongst the crowd. At a certain moment, everyone raises their hand and makes a peace sign.

Voice-over	Yes. An English-speaking woman explains what we are seeing and what the historical background to the scene is.	Yes. An English-speaking man explains the scenes we are seeing to us and how the man ended up in this situation.	Yes. A Spanish speaking man tells us about the difficulties he and his wife have faced.	No. Later in the video we do witness a conversation between a group of men, where one of them talks about the time the police took his blankets from him and how people got mad about the “homeless sweep”.	No.
Subtitles	Yes. A subtitle tells us where we are at the beginning of the video.	No.	Yes. A subtitle tells us where we are at the beginning of the video. The subtitles than continue to translate what the Spanish voice voice-over is saying into English.	Yes. A subtitle tells us where we are at the beginning of the video. The subtitle then goes on to explain what the context of the scene is. We learn about the amount of homeless people living in Denver, the lack of shelters and the sweeping of homeless encampments. We also learn about the police taking blankets from a homeless man earlier in November.	Yes. The subtitles tell us what we are seeing and what the context of the scenes is. We learn about the attack that took place earlier, killing four people. We also learn about the vigil and the police being honored for their handling of the attack.
Sounds	We hear the wind and birds chirping in the background. When a man enters a building, we hear a door opening and closing and the	In the background, we hear traffic and people talking and walking on the streets.	We hear the water and rowing of the boat. We hear birds in the distance	We hear traffic and people passing by in the distance. We hear a woman stacking wood and making a fire and we hear the voices of two	We hear the rumors of people walking by, pausing to put down flowers. Later, we hear a singer paying tribute to the victims.

	sounds of birds flying away.			men who are having a conversation.	
Perspective	We experience the video as if we are present at the scene, after the action happened. As if we are teleported to the scenes, dropped off to look around for a bit, then taken to a new scene.	We experience the video as if we are looking at the scenes but are not really a part of them. This is enhanced by the camera being above eye-level throughout the video, more like we are looking a bit down on the scenes.	We experience the videos as if we a looking at the scene and accompanying the people in the video. This is enhanced by the camera is placed above eye height.	We experience the scene as if we are looking at it from a distance. This is enhanced by the camera being placed at a distance of the conversation and encampment.	We experience the video as if we are present at the vigil, after the attack took place. The scenes are filmed a bit above eye-level, which takes away from feeling part of the scene a bit.

Appendix 2. Procedures

(0) Briefing

During this step, participants will be welcomed, and the instructions will briefly be explained. Participants are asked to sign a consent form and fill in a demographic questionnaire (results from this demographic can be used in the discussion).

Questions to be answered beforehand are:

- Age?
- Gender?
    - M
    - F
    - X
- Highest form of education?
    - Primary school (basisschool)
    - Secondary school (middelbare school)
    - MBO
      HBO
    - University
- Previous experience with VR?
    - None
    - I tried on a VR headset before, but that is it
    - I used a VR headset a few times
    - I use a VR headset regularly
- Do you have a tendency to get motion sick?
    - Yes
    - No

(1) Training

Computer participants: will be asked to have a seat in front of the monitor. They will be instructed on the videos they will be seeing and on how to answer the questions posed in between videos. When the experiment starts, they will be asked to put on the headphones and start the video they are seeing. The experiment starts with a test video which gives both the participants and the researchers the opportunity that everything runs okay.

VR participants: will be asked to have a seat on a chair that has wheels and can move around. Participants will be seated during the experiment but will have the ability to turn their head or turn on the chair to look in any direction during the videos. They will be instructed on the videos they will be seeing and on how to answer the questions posed in between videos. They will be than be instructed on how to put on the VR glasses. They are given a remote and asked to start either video A or video B. The experiment starts with a test video which gives both the participants and the researchers the

opportunity that everything runs okay. When the test video starts, the researchers take the remote from the participant.

(2) Experiment

After the training phase, we will start with the actual experiment. At the start of the experiment, participants are told that they are, at any point, allowed to stop the experiment in case they feel sick (because of the VR motions) or want to stop for different reasons.

During the experiment, the participants will be divided into four groups Depending on the group, participants will watch either high or low-arousal videos. The groups + order of videos are:

Group 1: Participants watch high arousal negative valence 360-degree news videos on a VR headset.

Group 2: Participants watch low arousal negative valence 360-degree news videos on a VR headset.

Group 3: Participants watch high arousal negative valence 2D news videos on a computer monitor.

Group 4: Participants watch low arousal negative valence 2D news videos on a computer monitor.

Why do we do this?

We decided to divide participants in these four groups because this division enables us to test the influence of different modalities on skip intention. The results of group 1 and group 2 will give us a better understanding of differences in skip intention between watching high arousal negative valence content in an immersive environment versus low arousal negative valence content in the same immersive environment. The results of group 3 and group 4 will help us see whether there is a difference in skip intention between participants watching either high arousal negative valence or low arousal negative valence content in a different, 2D, setting.

(3) Intermezzo: skip?

After each video, participants will be asked how likely they are to want to watch another video. The question will appear either on the computer monitor or in the VR environment. Participants are asked to answer the question raising the corresponding number of fingers. This enables the researchers to test several participants at the same time without them being influenced by each other's answers. The answers to these questions will help us construct and validate an emotional content saturation news avoidance scale and see if the way high arousal news content (known to be emotional content) is consumed impacts skip intention.

(4) Debrief

When the experiment has ended, participants will be asked to take of either the headphones or the headphones and the VR glasses. The participants are asked to fill out after-experiment questionnaire. After finishing, they are handed an information sheet with who to contact if they want their data to be withdrawn or if they have any complaints.

Questions to be answered afterwards are:

- On a scale of 1-5, how much did you enjoy watching these videos?
    - 1 – I really did not like it
    - 2 – I did not like it that much
    - 3 – neutral
    - 4 – I like it
    - 5 – I like it a lot
- During the experiment, did you sometimes feel like you were actually present at the scene(s) presented?
    - Yes
    - No
- Video (1/2/3/4/5/) was on (subject entered here). How did you feel while watching this video?
    - Scared
    - Sad
    - Neutral
    - Happy
    - Excited
    - None of the above, but:
- Was there a point throughout the experiment, where you wanted to stop watching?
    - No
    - Yes, namely:

Appendix 3. Overview of Measurements

Measure	Source	Question	Answer format
Skip intention	Based on Fonseca and Kraus (2016)	How likely are you to want to watch another video, on a scale of 1 (very unlikely) to 5 (very likely)?	1 = very unlikely 2 = unlikely 3 = neutral 4 = likely 5 = very likely
Novelty	Based on Wehden et al. (2021)	Previous experience with VR?	○ None ○ I tried on a VR headset before, but that is it ○ I used a VR headset a few times ○ I use a VR headset regularly
		Further measures	
Feelings of being present	Ad-hoc	During the experiment, did you sometimes feel like you were actually present at the scene(s) presented?	○ Yes ○ No
Overall video enjoyment	Ad-hoc	On a scale of 1-5, how much did you enjoy watching these videos?	1 = I really did not like it 2 = I did not like it that much 3 = Neutral 4 = I liked it 5 = I liked it a lot
Feelings while watching a video	Ad-hoc	Video [insert number of video] was on [enter topic of video]. How did you feel while watching this video?	○ Scared ○ Sad ○ Neutral ○ Happy ○ Excited ○ None of the above, but:
Reasons to want to stop watching	Ad-hoc	Was there a point throughout the experiment, where you wanted to stop watching?	○ No ○ Yes, namely: