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EL IMPACTO DE LAS EXPERIENCIAS MEDIÁTICAS INMERSIVAS A TRAVÉS DE LAS RESEÑAS DE USUARIOS: ANÁLISIS CUALITATIVO SOBRE *TRAVELING WHILE BLACK*

User reviews of the impact of immersive media experiences: A qualitative content analysis of user comments about Traveling While Black

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RESUMEN

Pocos estudios abordan los efectos que las producciones inmersivas sociales producen en sus usuarios. El análisis de las opiniones de estos usuarios sobre su experiencia en diferentes inmersivos es una posible forma de evaluar su impacto. Por ello, este artículo propone un modelo de análisis cualitativo de dichos comentarios, basado en una modificación de la categorización propuesta por Bourgonjon et al. (2016) en la que evalúan el impacto de los videojuegos mediante el análisis de opiniones positivas de los usuarios. En esta investigación, la categorización se amplía para incluir la evaluación de comentarios negativos sobre productos inmersivos con temática social. Los ocho pares de categorías resultantes se aplican a *Travelling While Black* (Roger Ross Williams, 2019), galardonado documental de realidad virtual sobre el racismo sistemático contra los negros. El análisis permite una evaluación más completa del impacto de las narrativas inmersivas, destacando tanto los aspectos positivos como los negativos expresados por los usuarios. Los hallazgos confirman la importancia del disfrute en las evaluaciones positivas de los usuarios de realidad virtual, mientras que plantean dudas sobre la reputación de la realidad virtual como la "máquina de empatía definitiva".

Palabras clave: Realidad virtual, reseñas de usuarios, inmersivo, prosocial, análisis cualitativo

ABSTRACT

There are few studies on the effects of immersive media dealing with social issues. The analysis of user reviews of immersive media experiences is a potential way of evaluating the impact of such experiences. This article proposes a qualitative analysis model for user comments on immersive media productions, based on a modification of the categorization proposed by Bourgonjon et al. (2016) for assessing the impact of video games by analyzing positive user reviews. In this article, the categorization is expanded to include the evaluation of negative comments on immersive products with social themes. The resulting eight pairs of categories are applied to *Traveling While Black* (Roger Ross Williams, 2019), an award-winning virtual reality narrative on anti-Black racism. The analysis allows for a more comprehensive evaluation of the impact of an immersive narrative, highlighting both the positive and negative aspects identified by users. The findings confirm the importance of enjoyment in the positive evaluations of virtual reality users, while raising questions about the immersive media experience's reputation as the "ultimate empathy machine."

Key words: Virtual reality, user reviews, immersive, prosocial, qualitative content analysis

1. INTRODUCTION

In recent years, there has been a major boom in the creation of immersive content. The research team working on the *Virtual Realities Immersive Documentary Encounters* project directed by Kirsten Cater has cataloged more than 500 VR productions made in the period from 2012 to 2018 alone (Bevan et al., 2019). This surge in popularity is the result of the commitment made by tech companies such as Meta, Sony, Valve, and HTC to the development of head-mounted display (HMD) units, the promotion of VR productions at festivals such as Sundance, SXSW, Raindance, and Cannes XR, and the creation of distribution platforms such as Oculus, Steam VR, and YouTube VR, which provide emerging producers, directors, creatives, and users interested in this new medium with forums for sharing, debating, and connecting with others. The growth of this new ecosystem is giving an ever-increasing number of filmmakers, corporations, and institutions the chance to explore the potential of virtual reality to produce immersive content (Rose, 2018), a development described by Mandy Rose as "the immersive turn" (p. 1).

This new situation offers an ideal context for the creation of immersive narratives with a powerful social impact. Ever since Chris Milk described virtual reality as "the ultimate empathy machine" (2015) in his well-known TED talk, numerous studies have assessed the prosocial potential of VR storytelling. Thanks to virtual reality's ability to transport the user into an environment that feels real, immersive narratives create spaces where the audience can participate in a much more direct experience, even to the point of being immersed in the diegesis (Martínez-Cano et al., 2023). This allows them to engage more with the story and to enjoy a much more realistic and dynamic experience (Popat, 2016), which in turn gives immersive narratives the potential to promote prosocial behavior, i.e., altruistic, cooperative behavior engaged in by individuals with the aim of benefiting others more than themselves (Moñivas, 1996).

Numerous studies have assessed the prosocial effects of exposure to immersive narratives, thereby confirming their impact on improving attitudes toward others (van Loon et al., 2018; Christofi et al., 2020) or on reducing social stigma (Tong et al., 2020; Ventura et al., 2020; Thériault et al., 2021), which in turn translates into fewer prejudices and a greater desire to help others. This idea is supported by the research of scholars such as Ahn et al. (2013), whose experiments demonstrated that participants in immersive experiences spent twice as much time trying to help others than those who had only imagined the experience. Similar conclusions were reached by Oh et al. (2016) and Herrera et al. (2018), whose studies found that immersive experiences facilitated positive attitudes toward people who were different from the participants.

This is partly due to the fact that this type of virtual environment creates a space of contact that can mitigate intergroup conflicts in the real world (Gelbach et al., 2015). The technology itself creates an immersive virtual environment where people can take a more active role, which fosters more positive attitudes toward people in different social groups while at the same time making them more critical of their own group (Hasson et al., 2019).

Outside the academic sphere, the Meta corporation has launched the *VR for Good* initiative on Oculus, a platform that “harnesses the unique capabilities of VR to create human-centric stories that promote empathy and empowerment” (Meta, n.d.). Thanks to virtual reality productions of this kind, users are able to explore spaces and realities to which they would not otherwise have access and to experience the sensation of being there in a direct encounter with the other.

One notable product offered on the *VR for Good* platform is Roger Ross Williams’s *Traveling While Black* (2019), an immersive experience that was nominated for an Emmy Award in 2019 and has received considerable attention in traditional media. It has also enjoyed a positive response from users, who have posted reviews on social media describing how the immersive experience has influenced them. These reviews, which form the central focus of this study, provide a significant corpus for analysis in order to evaluate the prosocial function of this type of experience, especially given that online comments offer a useful means of gauging public opinion, as various studies have highlighted. For example, a study conducted on 1,471 participants (Stroud, Van Duyn, & Peacock, 2016) found that 55% of US citizens had posted comments online before and 78% read the opinions of other users.

In fact, online reviews and user comments have been studied in other fields of audiovisual production, such as reviews of films and television series on IMDb (Topal & Ozsoyoglu, 2016; Schneider, Domahidi & Dietrich, 2020), opinions of video games on internet forums (Bourgonjon et al, 2015), user comments in news media (Reimer et al., 2021) and comments on YouTube videos (Thelwall, 2017; Eeken & Hermes, 2019). These studies have helped to characterize communities of organic users with an interest in different formats. For example, a study by Eeken & Hermes (2019) found that the Doctor Who community used the series to reflect on various social and political issues, such as gender roles and the place of women in relation to questions of identity, while the study by Bourgonjon et al. (2015), which this study draws on for its methodology, challenges the widespread notion that video games are violent spaces with its portrait of a cohesive community where friendships are created through playing together online and whose attitudes, beliefs, and perspectives in relation to people who are different have improved thanks the influence of video games.

However, the analysis of user reviews of immersive experiences proposed here has not been the subject of much previous research. In view of the fact that it is a very recent field of study with no methodology established specifically for the immersive context, for this study a model has been created that facilitates a qualitative analysis of user comments with the aim of better understanding public reception of such experiences.

2. HYPOTHESIS AND OBJECTIVES

Based on the observations outlined in the introduction and the theoretical framework for this study, the following research hypothesis can be established: user reviews of immersive experiences are a useful way of assessing the potential prosocial effects of such experiences.

Based on this hypothesis, this study has two main objectives:

O1: To develop a methodology that will facilitate the analysis of user reviews of virtual reality in order to understand its effects on users. As the analysis of online reviews in the area of virtual reality is relatively new, this study adopts a research method based on the coding system proposed by Bourgonjon

et al. (2016), modified with the aim of determining the impact of immersive experiences of this kind. The method thus consists of a directed qualitative content analysis (DQICA) (Hsieh & Shan-non, 2005).

O2: To examine the effects of viewing *Traveling While Black* (2019) using the methodology proposed for the analysis of comments on immersive narratives. The aim of analyzing these reviews is to contribute to the incipient corpus of qualitative research on opinions offered by VR users on forums created for the specific purposes of discussion and debate.

3. METHOD

3.1 CASE STUDY

The immersive content on the Meta platform includes a section called *VR for Good*, whose objective is to use VR stories “to promote connection, empathy and equality” (Meta, 2023). The content on *VR for Good* aims to promote social justice through “narratives that examine the treatment of people belonging to any race, religion, gender, and sexual identity.” Included in their catalogue of 26 immersive experiences is the VR documentary *Traveling While Black* (*TWB*, 2019) by Roger Ross Williams, produced by Felix and Paul Studios. *TWB* portrays the “risks faced by Blacks on the road in mid-20th Century America, and the safe spaces as listed in the famous guide, *The Green Book*, where they could eat and sleep” (Meta, n.d.). This immersive documentary takes the user inside Ben’s Chili Bowl, which ever since its opening in 1958 has been an emblematic meeting place for African Americans in Washington D.C. The user is invited to enter the space and reflect on race relations in the United States through “the intense earnestness of those testifying to racial oppression” (Dowling, 2021: 11). Because it locates the viewer as a witness, *TWB* is able to create just the right distance between “nearness and separation” (Ceuterick and Ingraham, 2021: 12) to allow users to be embodied as themselves inside the experience, without taking the other’s place.

Before it was added to the Oculus platform, *TWB* had already received recognition at numerous international festivals, including its world premiere at the Sundance Film Festival in 2018, receiving an Emmy Award nomination in 2019, and winning the award for Best Immersive Experience (non-fiction) at the Canadian Screen Awards in 2020. It is also significant that *Traveling While Black* has the second largest number of user reviews in the *VR for Good* catalogue, behind Barry Gene Murphy and May Abdalla’s *Goliath: Playing with Reality* (2021). Although the latter has received more reviews, *Traveling While Black* was chosen for this study due to the controversial nature of its subject matter, distinguishing it as a valuable source of information on the reception of an immersive experience and its effect on users.

3.2 DATA COLLECTION

Collecting data in the Oculus environment is more complex than it is on most online review platforms because multiple sources need to be used. The user reviews were collected in December 2022 from the pages dedicated to *Traveling While Black* in three different sources: a) the Oculus marketplace website; b) the Oculus app for computers; and c) the Oculus store, viewable only when using an Oculus VR headset. Initially, the analysis was only going to include reviews on the Marketplace website, but it was later decided to include the other two sources as well because although they are operated by the same company, they contain different comments.

The final search yielded a total of 262 reviews, which break down as follows:

- a) 34 reviews on the Oculus Marketplace website.
- b) 70 reviews on the Oculus app for computers.
- c) 158 reviews on the store accessible via the HMD device.

3.3 SCREENING (SELECTION) AND CODING

An initial screening of the reviews was conducted to identify the ones that would be analyzed. Of the 262 reviews in the initial sample, 14 were excluded: five because the words they contained were incomprehensible (e.g., “Xjnzbn” and “Gm çngnl”); eight because they focused entirely on technical issues (e.g., “Clicked by mistake how can I hide it from my library”); and one because it was not relevant (only containing the words “Nothing more”). The final number of reviews included in the analysis was thus 248.

3.4 CATEGORIZATION

Most of the coding for this study is based on a modified version of the model proposed by Bourgonjon et al. (2016), whose study evaluates positive reviews of video games posted by users on “popular game forums” (p. 3). Their coding method drew on previous work by Belfiore and Bennett (2008), who analyzed the social impact of the arts with a focus on literature, poetry, and theatre. Belfiore and Bennett’s study established eight “cultural rhetorics” related to how these art forms affect people’s lives: (1) *Corruption and Distraction*; (2) *Catharsis*; (3) *Personal Well-Being*; (4) *Education and Self-Development*; (5) *Moral Improvement and Civilization*; (6) *Political Instrument*; (7) *Social Stratification and Identity Construction*; and (8) *Autonomy of the Arts and Rejection of Instrumentality*. Bourgonjon and his team modified these categories with the aim of adapting them to the specific context of video games and simplifying them in order to avoid potential overlapping between categories due to the “historical roots” they share (p. 5). To this end, for their research they eliminated the categories of *Corruption and Distraction* and *Autonomy of the Arts and Rejection of Instrumentality* and divided *Education and Self-Development* and *Moral Improvement and Civilization* into four distinct categories. They thus developed a system of eight categories for coding user reviews: (1) *Catharsis*; (2) *Personal Well-Being*; (3) *Education*; (4) *Self-Development*; (5) *Moral Improvement*; (6) *Civilization*; (7) *Political Instrument*; and (8) *Social Stratification*.

Based on this coding, Bourgonjon and his team limited their analysis to comments that focused on the positive effects of video game use, as their objective was “to move beyond prior research that mainly targeted potential negative effects of gaming” (p.3). In the case of the present study, in light of the controversial nature of the subject matter dealt with in *Traveling While Black* and the large number of negative comments it has received, the classification system has been expanded to include an opposite to each category used by Bourgonjon et al. Specifically, 23% of the 1,054 ratings for *Traveling While Black* are low (one or two stars), and the percentage of negative reviews (24.5% of 245, or n=60) is significant enough to justify their inclusion in the analysis.

This study therefore includes the following opposite categories to the eight categories proposed by Bourgonjon et al. (2016): (1) *Animosity*; (2) *Ill-Being*; (3) *Disinformation*; (4) *Personal Stagnation*; (5) *Moral Incapacity*; (6) *Dissuasion*; (7) *Negative Political Instrument*; and (8) *Social Blindness*, as shown in Table 1.

Table 1. Proposed Coding

Codes used by Bourgonjon et al. (2016)	Opposite codes added for this study
<i>Catharsis</i>	<i>Animosity</i>
<i>Personal Well-Being</i>	<i>Ill-Being</i>
<i>Education</i>	<i>Disinformation</i>
<i>Self-Development</i>	<i>Personal Stagnation</i>
<i>Moral Improvement</i>	<i>Moral Incapacity</i>
<i>Civilization</i>	<i>Dissuasion</i>
<i>Political Instrument</i>	<i>Negative Political Instrument</i>
<i>Social Stratification</i>	<i>Social Blindness</i>

Source: Prepared by the authors

This study thus proposes an adaptation of the model developed by Bourgonjon et al. with the use of eight pairs of categories to facilitate an in-depth analysis of user responses to immersive experiences.

The first pair, based on the first category proposed by Bourgonjon et al., is *Catharsis/Animosity*. Drawing on the Aristotelian definition of the term, Bourgonjon et al. describe *Catharsis* as “a purification of emotions and thoughts after experiencing pity and fear for the main character’s troubles” (p.5). Based on this definition, comments assigned to this category are those that express “identification with characters, an emotional release, and a clarification of intellectual concepts” (p.5). For the present study, *Catharsis* has been complemented by *Animosity*, referring to comments that express a visceral and emotional rejection that may be associated with a failure to identify with the characters.

The second pair is *Personal Well-Being/Ill-Being*, based on the second category proposed by Bourgonjon et al. Closely related to the first category, *Personal Well-Being* refers to the capacity of video games to offer “enjoyment or [provide] people [with] moments of contemplation and therapeutic assistance” (p.5). This classification is thus assigned to comments expressing “pleasure/enjoyment, self-reflection, escapism, and the therapeutic use of games,” as well as the possibility of “transportation to fantasy worlds” (p.5). This category has been complemented in the present study with *Ill-Being*, for the classification of reviews expressing boredom, feelings of disappointment, or an inability to escape into fantasy worlds.

The third pair, *Education/Disinformation*, is based on the third category proposed by Bourgonjon et al., *Education*, applying to comments referring to the acquisition of knowledge or understanding through the media experience. To complement this category in the present study, the concept of *Disinformation* is used, applicable to reviews claiming that the immersive experience provides erroneous or harmful information intended to manipulate the user.

The fourth pair, *Self-Development/Personal Stagnation*, draws on the fourth cultural rhetoric used by Bourgonjon et al., who use *Self-Development* to classify content that “denotes a change in perspectives, beliefs, or personality” (p.5). In opposition to this category, this study uses the category *Personal Stagnation* for comments in which users express preexisting beliefs, perspectives, or personality traits that appear to have been reinforced or consolidated instead of challenged or transformed by the immersive experience.

The fifth pair is *Moral Improvement/Moral Incapacity*. For Bourgonjon et al., *Moral Improvement* refers to “becoming a better person and showing greater empathy” (p.5). *Moral Incapacity* is proposed here as its opposite, applying to comments that reflect selfish attitudes and an inability to empathize with the other, often to the point of questioning their feelings, emotions, or experiences.

The sixth pair of categories is *Civilization/Dissuasion*. *Civilization* is used for the classification of user posts that refer “not only to making friends and joining game communities but also to increased participation in the arts and video game culture” (p.5), or in the case of this study, in immersive experiences. In opposition to this concept, the category of *Dissuasion* is used here to refer to comments which, instead of aiming to create community, attempt to dissuade others from trying this type of immersive experience, with explicit recommendations not to view it or calling for its removal from the platform.

The seventh pair, *Positive Political Instrument/Negative Political Instrument*, is based on the category used by Bourgonjon et al. for posts that make explicit reference to politics, with words such as “policy” or “government” (p.5). In view of the wide variety of such terminology, more precise terms have also been included in this study, such as “parties,” “Trump,” and “political.” While Bourgonjon et al. only define this category in terms of the use of political terminology, the present study adopts the definition offered by Belfiore and Bennett (2008) for political instrument, as that which “[c]ounteract[s] the coercive nature of political power, by giving voice to marginalized or silenced perspectives, thus playing an emancipative social role and contributing to progressive political change” (p. 164). Thus, *Positive Political Instrument* covers comments that would fall under this definition, while *Negative Political Instrument* refers to messages that dismiss the immersive experience as propaganda or as content designed to pursue partisan political objectives.

The final pair of categories proposed for this study is *Social Stratification/Social Blindness*. Bourgonjon et al. use *Social Stratification* for the classification of comments that express or recognize the importance of “social and/or economic mobility” (p.5). In opposition to this positive view is *Social Blindness*, which is used here to refer to comments that deny the reality of social stratification and the problems associated with socioeconomic inequality.

3.5 CONTENT ANALYSIS

A directed content analysis (Hsieh and Shannon, 2005) has been used to study the sample. Two coders analyzed each review to determine whether any of the categories described above could be applied to it. When the category in question was applicable, the post was marked with a 1. If the comment did not contain any reference to that category, it was marked with a 0. Any posts that made reference to several categories could have multiple categorizations. In the event of disagreement between coders, a third coder was assigned the task of assessing the suitability of the categorization.

4. RESULTS AND DISCUSSION

The analysis of the 248 reviews resulted in a total of 574 categorizations, breaking down by category as shown in Table 2.

Table 2. Coding classification resulting from the content analysis.

Category	Coding entries
<i>Personal well-being/ Ill-being</i>	132
<i>Personal well-being</i>	113
<i>Ill-being</i>	19
<i>Social Stratification/ Social Blindness</i>	117
<i>Social Stratification</i>	73
<i>Social Blindness</i>	44
<i>Civilization/ Dissuade</i>	97
<i>Civilization</i>	85
<i>Dissuade</i>	12
<i>Education/ Disinformation</i>	70
<i>Education</i>	52
<i>Disinformation</i>	18
<i>Catharsis/ Animosity</i>	65
<i>Catharsis</i>	49
<i>Animosity</i>	16
<i>Self-development/ Personal Stagnation</i>	54
<i>Self-development</i>	30
<i>Personal Stagnation</i>	24
<i>Moral improvement/ Moral inability</i>	22
<i>Moral improvement</i>	11
<i>Moral inability</i>	11
<i>Positive/ Negative political instrument</i>	17
<i>Positive political instrument</i>	5
<i>Negative political instrument</i>	12

Source: Prepared by the authors

Each category is discussed below with reference to the number of coding entries it received. As Bourgonjon et al. (2015) observe in their study, these categories are not completely self-contained, and thus the relationships between them are considered here wherever possible. All quotes from user reviews included below are transcribed as originally written, without grammatical or spelling corrections.

4.1 PERSONAL WELL-BEING/ILL-BEING

This pair is the most prominent one, identified in 53.22% of the reviews analyzed (n=132). Most of these (n=113) describe the viewing experience as enjoyable (*Personal Well-Being*), while 19 describe it as boring or even unpleasant (*Ill-Being*).

The comments categorized under *Personal Well-Being* explicitly describe the viewing experience as enjoyable: “A very powerful and important presentation. Incredible” or “Beautifully done. This was an amazing experience.” The prominence of this category confirms the idea that with this type of entertainment, people are looking for an escape from reality and boredom through experiences that allow them to relax and enrich their personal worlds (Yang, 2023). It also makes it clear that users are interested in having more virtual reality experiences (Lee and Tsai, 2010), as 34.51% of comments in

the *Personal Well-Being* category also explicitly call for more VR content to be created or encourage other users to view it (thereby also placing them in the *Civilization* category): “I really enjoyed it. I’d love to see more docudramas made like this.” Recent research has found that enjoyment influences user motivation, adherence, and participation in immersive experiences (Xu et al., 2020).

Falling into the opposite category, *Ill-Being*, are comments (n=19) expressing boredom or some other kind of unpleasant feeling: “This was so boring and sucky to other people, I had to turn it off after 7 mins Because I couldn’t handle how boring it was and on top of that it was just pandering and was so annoying.”

Users express these kinds of feelings for various reasons that have no direct relationship to any of the other categories used in this research. However, two types of responses are worth highlighting. The first consists of responses that associate their bored reaction with a lack of interactivity: “Boring but informational [...]. There’s no interaction, I wish Oculus would add a store/library category for this type of non-game content.” Although the relationship between enjoyment and the user’s capacity for interaction in the immersive experience has been studied by some researchers (Chang et al., 2018; Shafer et al., 2019), there is insufficient evidence to confirm whether experiences with a low level of interaction can hinder participant enjoyment and trigger the kind of boredom expressed in these comments.

The second type of response refers to the discomfort caused by motion sickness. According to Rupp et al. (2019), some users may experience this reaction due to a personal disposition or to the type of HMD unit used. Responses of this kind to any immersive experience are therefore to be expected: “This video can cause nausea because it does not accurately reflect your body movements – be sure to sit very still when viewin [sic].”

4.2 SOCIAL STRATIFICATION/SOCIAL BLINDNESS

47.18% (n=117) of the reviews analyzed make some kind of reference to this pair, reflecting users’ beliefs related to social status and class, focusing specifically on questions of racial identity. On the one hand, 62.39% (n=73) of the comments placed in these two categories have been classified under *Social Stratification* as they acknowledge some form of discrimination against African Americans: “Black Americans face moving around the country and just being in public. As is stated, there is no Green Book today but Black youth carry one aroun[d] in their heads becayse [sic] they have to.” Special emphasis is given to the fact that this racism is still present today in American society: “This is a documentary that reveals a problem in America that is still very prevalent today,” “These type of things still happen all over the country every day,” or “I[t] makes me think that maybe everything is not solved in USA, whether it is about racial discrimination or gun usage.” More than half of this group of users also recommend viewing this production (*Civilization*) as a means of understanding racial oppression: “this short documentary teac[h]es us of the past and present [sic] hardships suffered by the African American community [...] This documentery [sic] should be shown in every school.”

On the other hand, 37.61% (n=44) of the comments in this pair are classified under *Social Blindness* because they play down the experiences of racism suffered by African Americans. The comments in this category include arguments that racism is something that “happened decades ago” and that “it’s time to move on” and “stop talking about it”: “The world has moved on from those day[s] seriously. Forget the past and start focusing on making the future better.” These comments are not closely related to any other category, as their main focus is the question of racism.

This polarization between those who acknowledge discrimination and those who deny it exposes the prejudices and biases that individuals bring to any type of media viewing experience:

If you look up the shooting the kid had an air sof[t] gun and was pointing it at people police came and the kid pointed the gun at the police and the police shot the kid. It's sad but if you look from the police perspective it's justified. It's ok.

While virtual reality can be a useful tool for improving interracial contact, numerous studies have confirmed that participants' beliefs about race and implicit racism influence how they view such media products (Taylor et al., 2020). A study by Peck et al. (2021) even found that White participants were more likely to shoot at Black avatars than at White ones in a virtual environment.

4.3 CIVILIZATION/DISSUASION

The third most common pair of categories is *Civilization/Dissuasion*, identified in 39.11% (n=97) of the reviews analyzed. 87.63% of posts in this pair (n=85) fall under the *Civilization* category as they encourage readers to view the immersive experience or call for the creation of similar productions, while 12.37% (n=12) are classified under *Dissuasion* because they explicitly discourage users from viewing the VR or call for its removal from the platform.

Comments in the *Civilization* category encourage others to view the production in various ways, three of which are particularly prominent. The most common way is by directly recommending *TWB* to other users: "highly recommended," "a must watch," or "if you see this please download the game." The second most frequent way is by expressing the need for more virtual reality experiences with a social focus in general. Users expressing this need may address the community at large ("We definitely [*sic*] need more videos like this" or "I look forward to seeing more pieces like this in the future"), future VR directors in general ("If you want to make VR content, *TWB* is a must-see"), or the directors of *Traveling While Black* specifically ("And as always, i cant wait to see what felix and paul, and all the other studios will show in the future – please never stop making this content!"). The third most common way involves references to users' intentions to share the production with other people in their personal environment ("I will be getting my family and friends to experience this too," or "I love this Virtual video I shared it with my 10 year old son going to share it with my whole family I'm dig [*sic*] about the history from back in the day") or in a professional context ("I love this! I'm a teacher and I use this with my students regularly and it is wonderful.").

In any case, the reason for recommending or calling for immersive experiences of this kind is in most cases (57.65% n=49) the user's enjoyment of the production: "I am amazed at the thought that was put into this documentary and the experience was mind blowing. I recommend any and everybody to watch this beautiful documentary. Amazing." This results in a strong connection to comments categorized under *Personal Well-Being*, as users who have enjoyed the viewing experience are more likely to recommend it to other users.

At the same time, there is another prominent group of viewers (n=38, or 44.71% of comments in this category) who link their recommendation to the immersive experience's treatment of racial issues

For people to say move on and forget this are crazy. This still exists today and I'll make sure my children know and never forget what's still going on. This was very real and very informative. Please make more. I'll alway[s] purchase.

In such comments, the recommendation is based more on the subject matter addressed than on the user's personal enjoyment of the production, although recommendations referring to the latter are more common than those alluding to the former.

Comments classified under *Dissuasion* can also be split into three subcategories: comments that actively discourage readers from viewing the production (n=5: "Don't recommend this game at all," or "don't play it"); comments that explicitly call for its removal from the platform (n=4: "take this crap off oculus" or "We do not need it or want in in our apps!"); and comments discouraging the creation of VR projects of this kind (n=3: "there are a lot of things to do in VR and this is not something I'll be doing"). In most cases (91.67% of these comments, or n=11), rather than being based on whether or not the production itself is enjoyable (*Personal Well-Being/Ill-Being*), the reason for dissuading others from viewing *TWB* is related to a direct denial of the existence of racism against Blacks in contemporary society (*Social Blindness*): "a waste of time I regret watching it. The world has moved on from those day[s] seriously."

4.4 EDUCATION/DISINFORMATION

This pair of categories, related to the educational (*Education*, n=52) or manipulative (*Disinformation*, n=18) nature of this immersive experience, was identified in 28.23% of the comments analyzed (n=70).

In many of the comments categorized under *Education*, *TWB* is praised for being an "informational" and "educational" experience. Users identify it as a useful tool for learning about the "Green Book" and "about the challenges and dangers of Travelling Black in America" or about "the past and present hardships suffered by the African American community." These comments reflect what recent studies have shown in relation to the use of immersive environments to teach participants about an issue through a personal experience, simulating situations that would be difficult or impossible to recreate outside a virtual environment. According to a recent meta-analysis, virtual reality has "a strong and positive influence on educational outcomes" (Yu and Xu, 2022: 17).

The "strong and positive influence" of the use of VR in an educational context includes motivating and improving user performance (Kim and Im, 2022), which explains why 57.69% of these comments (n=30) also express having enjoyed the viewing experience (*Personal Well-Being*): "Worth every minute [...] I'm glad I watched. It was a learning experience." Kim and Im's study found that immersive experiences were able to enhance the user's desire to learn something new and to participate actively in such experiences. Similarly, a study by Jung et al. (2017) found that the greater the level of immersion, the greater the level of engagement with the content, which in turn made for a better learning experience compared to less immersive traditional media.

Conversely, comments categorized under *Disinformation* (n=18) not only deny the educational value of the production but dismiss it as "extremely inaccurate," as "white racist propaganda," as "race batin [sic] propaganda," or as "the most false narrative in history." These users claim the presence of a manipulation that in most cases falls under the category of *Social Blindness*. The idea that this kind of storytelling could be used to manipulate VR users has been suggested previously in research by Green et al. (2021), who collected the impressions of users after viewing non-fiction VR content. In that study, the participants responded that although VR had the potential to engage people, it may also have the capacity to make users more vulnerable to a manipulation of the immersive experience because of the realistic sensation it offered. This sensation of closeness could thus make some users feel that they are being subjected to an effort to manipulate them.

4.5 CATHARSIS/ANIMOSITY

The fifth pair of categories is *Catharsis/Animosity*, which has been identified in 26.21% (n= 65) of the reviews analyzed. Most of the posts in this category (75.38%, n=49) fall under *Catharsis* as they express an emotional release, while 24.62% (n=16) are classified under *Animosity* because of their visceral rejection of the immersive experience.

The positive comments express intense emotions (such as “shocking,” “touching,” or “frightening”) and powerful feelings elicited by the viewing experience: “this thing brought me to tears, several times,” or “I’m not a very emotional person, but this made me cry.” Moreover, 63.26% of these comments not only express cathartic responses to viewing the production but also recommend immersive experiences of this kind to others, resulting in a close relationship between this category and the *Civilization* category.

The comments classified under the opposite category of *Animosity* (n=16) express negative reactions to the immersive experience, which users dismiss as “terrible” or “shameful.” This visceral reaction to the immersive experience is linked in most cases (68.75% of the total) to the category of *Social Blindness*: “Literally the worst, most racist storytelling I’ve ever heard” or “This film categorizes people based on race and pushes a slanted, antiquated narrative [...]. Shameful.” Half of these comments also describe the production as *Disinformation*: “This sjw crap makes me want to throw my oculus in the trash, not sure why you feel the need to push propaganda on us,” or “The title is horrible. The elderly woman that you see repeatedly clearly is scripted dialog.” The rejection of the immersive experience therefore appears to be due to the user’s reception of the content of the production itself and not to a lack of enjoyment of its visual or formal aspects.

4.6 SELF-DEVELOPMENT/PERSONAL STAGNATION

This pair of categories was identified in 21.77% of the comments analyzed (n=54). It includes reviews that mention changes to the user’s perspective and beliefs (55.56% of the total, or n= 30, *Self-Development*), and others expressing an explicit lack of comprehension of the perspectives offered by the immersive experience (44.44%, or n=24, *Personal Stagnation*).

Virtual reality has been used in a wide range of studies because it allows users to put themselves in another person’s place (Herrera et al., 2018; Chen et al., 2021). The reviews analyzed here include comments that illustrate this idea: “Handling the topic of race can be a heavy subject to cover but this experience really puts you in the shoes to see things from that particular perspective.” Others refer to its capacity to offer an “eye opening” (n=7) experience by giving users access to a new perspective that is different from their own.

Research has also shown that taking the victim’s perspective and empathizing with their suffering can increase users’ perception that what the perpetrator is doing is wrong (Aderman et al., 1974), make them more critical of the aggressor (Hasson et al., 2019; Chen et al., 2021), and help them to recognize their own mistreatment of the outgroup (Zebel et al., 2009). This effect can be seen in the relationship between *Self-Development* and the category of *Social Stratification*, as 53.3% of comments classified under *Self-Development* make direct reference to racism: “A needed perspective for most. Ignore the negative reviews filled with bigotry and racism. This is never more relevant and needed for all white folk (I myself am a white male).”

However, a significant number of comments have also been classified under *Personal Stagnation* (n=24), i.e., comments which, instead of reflecting a change of perspective or beliefs, express a lack of comprehension of the other (“I’ve been oppressed my whole life too but I’m not going to make everyone experience my life simulator,” or “However, still basically saying a type of person isn’t ‘free’

in the USA today, is ridiculous, and everything wrong with media in 2019”). Despite the large number of studies of VR that have demonstrated its capacity to promote perspective-taking and thus enhance understanding of the other, this pair of categories has been found to be one of the most polarized, with an almost equal number of comments in each category. This result challenges assertions in studies such as the meta-analysis by Ventura et al. (2020), analyzing the relationship between virtual reality and its perspective-taking capacity: “VR is a medium that uses technology to get an individual to take the perspective of someone else” (p.8). The polarization evident in the *Self-development/Personal Stagnation* pair of categories seems to contradict the proposition of a direct relationship between virtual reality and perspective taking.

4.7 MORAL IMPROVEMENT/MORAL INCAPACITY

This pair, identified in 8.87% (n=22) of the reviews analyzed, refers to comments expressing increased empathy toward the other (*Moral Improvement*, n=11), and those that express the opposite effect (*Moral Incapacity*, n=11).

The *Moral Improvement* category includes explicit references to greater empathy: “Brutally empathetic [...] This comes from the ability through VR to see not just the mother and her emotions but her audience of other diners, who have stopped what they are doing and are clearly deeply moved.” Virtual reality has been traditionally described as “the ultimate empathy machine” (Milk, 2015) due to its capacity to transport spectators to places and situations that they otherwise would not experience, thereby facilitating a better understanding of the other (Ventura et al., 2020). This idea is referred to directly in one of the comments analyzed: “VR is the greatest empathy machine and has the power to put you in a situation you otherwise would not have.”

Given that empathy is an emotional response toward the other, it is unsurprising that these comments are the ones containing the most adjectives suggestive of *Catharsis* (50%): “This is a brilliant example of VR’s potential to create empathy, providing a deeply movement experience [*sic*] that allows some sense of connection with the mistreatment of African-Americans, in the past and today.” They are also the most likely to include recommendations of the immersive experience to other users (*Civilization*, 72.72%).

On the other hand, *Moral Incapacity* refers to comments that display a lack of empathy toward the individuals depicted in the immersive experience

I did not know the circumstances surrounding Tamir Rice, unfortunately the media does not give details. His mother looks tatted up, not the normal motherly loving figure we commonly associate with and appears to shed no emotion for her loss.

Such negative comments not only display a lack of empathy toward African Americans but also suggest a very harsh judgement of their actions, often excusing aggressions against them in a way that blurs their role as victims and transforms them into aggressors: “The old woman mentioned she fear[s] the police in America. I fear Black men for the most part. I am sorry to say but you’ve painted quite the masterpiece in my life. Always playing the victim, weapons, drugs, rape...” This idea is reflected in a study by Bielen et al. (2019) that involved the recreation of a courtroom in VR, which found that the avatars of racial minorities were more likely to be found guilty than White avatars and were also likely to receive a harsher punishment than their White counterparts for the same offense.

Once again, the polarized nature of the comments seems to call into question the status of “empathy machine” attributed to VR by various authors in previous studies. The close relationship between this pair and the *Self-Development/Personal Stagnation* pair seems to suggest that the empathetic potential of virtual reality has been overestimated.

4.8 POSITIVE/NEGATIVE POLITICAL INSTRUMENT

This pair of categories, identified in 6.85% of the comments analyzed (n=17), involves any direct references to political topics (e.g., “political,” “parties,” “Trump,” or “administration”). These may be negative or partisan (n=12) or positive, advocating political change (n=5). The relatively small number of reviews classified under this category is in part due to the strict limitations of the category itself, which requires explicit reference to the topic.

This is the only pair of categories analyzed in which the negative category outweighs the positive, as 12 of these comments refer to the use of this VR production as a partisan tool aimed at manipulating viewers (“don’t let the democrats think for you”) and promoting a “liberal leftist ideology.” This category is therefore directly related to the *Disinformation* and *Social Blindness* categories.

[...] not sure why you feel the need to push propaganda on us, [...] i know you're a bunch of liberals trying to brainwash society. Btw since it seems like you're so concerned about what people went through 60 years ago I assume that we're going to get a video about what black people are going through right now in Africa since they're killing each other by the Millions right...

The comments classified under the *Positive Political Instrument* category (n=5) focus on the capacity of immersive experiences of this kind to bring about political and social change by giving a much-needed voice to marginalized or silenced perspectives: “people are starting to forget seeing elected parties here in Europe the last years. It is uprising racism again – a nightmare returning to us – and such kind of movies are saying it is not over.”

5. CONCLUSIONS

As this study has shown, the analysis of reviews posted by users of immersive productions that address social issues is a useful way of identifying the prosocial effects of immersive experiences and opens up new possibilities for the evaluation of their impact.

Given that most studies that have assessed online comments have focused on audiovisual formats such as films, television series, or video games, for this study it has been necessary to develop a new model based on the categorization proposed by Bourgonjon et al. (2018) for video games. While the eight categories proposed by Bourgonjon and his team evaluated the impact of video games based on the analysis of users’ positive opinions of them, the model presented here also includes eight opposite categories, as the usual controversy and hostile reactions that can be triggered by social issues, reflected directly in the high number of negative reviews posted by users, make it necessary to consider such responses as well. The analytical model proposed thus consists of eight pairs of categories (O1).

This model has been tested on *Traveling while Black* (O2), a VR production available on the Oculus platform that has received a high number of comments posted by users. The analysis of the data, evaluating both positive and negative responses, offers a broader view of the impact of the immersive media experience.

The pairs of categories that receive the most attention in the reviews analyzed are *Personal Well-being/Ill-being* (53.22%), *Social Stratification/Social Blindness* (47.18%), *Civilization/Dissuasion* (39.11%), and *Education/Disinformation* (28.23%). Reviews of the enjoyment of the media experience were overwhelmingly positive, and the majority of users considered it to be a useful educational tool as well as a means of exposing racial and social inequalities.

In contrast to other studies, this study has not identified a direct relationship between viewing the immersive experience and an improvement in perspective taking or empathy toward racialized people. In addition to the lower presence of reviews associated with the pairs *Self-Development/Personal Stagnation* (21.77%) and *Moral Improvement/Moral Incapacity* (8.87%), in these pairs there was also a smaller gap between opposing ratings: in *Self-Development/Personal Stagnation*, the results were 55.56% positive compared to 44.44% negative, while in *Moral Improvement/Moral Incapacity*, the two even reach parity. These results suggest that the reputation of virtual reality as “the ultimate empathy machine” may be overstated.

This study has a number of limitations. Firstly, immersive storytelling is still an emerging technology with a largely unconsolidated audience. Although a gradually increasing number of companies are investing in VR, it is still too early to describe it as an established mass media format. The need for a specific HMD device constitutes an entry barrier for many potential users, which makes the number of comments posted on VR platforms quite limited compared to other formats. Secondly, this study has focused entirely on a single immersive experience. Further research is needed to apply the model to other types of VR content, in order to better understand the effects of immersive narratives dealing with social issues.

Moreover, the very nature of an analysis relying on anonymous user comments makes it difficult to determine user profiles in order to identify their race, gender, or political affiliation unless these are explicitly stated in the comment. Having this information would facilitate a deeper understanding of the influences of these narratives and how the user’s identity affects their reception. Conducting interviews with users could serve as a starting point for developing an understanding of the motivations behind the comments they post.

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