



Virtual Reality Journalism and the Ethics of Immersive Storytelling: Presence, Empathy, and the Boundaries of Representation

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Abstract

This paper critically examines virtual reality journalism and immersive storytelling through the intersecting theoretical lenses of presence theory, embodied cognition, narrative transportation, and media ethics. Drawing on Slater's (2009) foundational distinction between Place Illusion and Plausibility Illusion, de la Pena et al.'s (2010) pioneering articulation of immersive journalism, and Green and Brock's (2000) narrative transportation theory, the study analyzes the psychological mechanisms, empirical evidence, ethical tensions, and sustainability challenges characterizing VR journalism. The paper synthesizes findings from experimental comparisons of immersive and traditional news formats, including Perez-Seijo et al. (2023) and Bujic et al. (2024), and systematic reviews including Hernandez-Rodriguez and Garcia-Perdomo's (2024) analysis of 69 studies and Karaduman et al.'s (2024) bibliometric review of 955 publications. The analysis reveals that VR journalism enhances emotional engagement and place illusion but does not consistently improve information retention or contextual understanding, that the empathy hypothesis receives only partial empirical support with emotional but not cognitive empathy improvements, and that adoption has stalled due to high production costs, limited audience access, and competition from short-form video. The paper examines ethical challenges

including manipulation potential, voyeurism concerns, and informed consent complexities, and evaluates alternative immersive formats including augmented reality, spatial audio, and hybrid approaches.

Keywords: virtual reality journalism, immersive storytelling, presence theory, empathy, digital ethics, 360-degree video, embodied cognition, journalistic representation, augmented reality, spatial audio

Introduction

Virtual reality journalism, the use of immersive technologies including head-mounted displays, 360-degree video, and computer-generated environments to create first-person experiential news content, represents one of the most ambitious and contested experiments in journalism's adaptation to digital media formats. Pioneered by Nonny de la Pena, widely recognized as the Godmother of VR journalism, immersive journalism leverages the psychological phenomenon of presence, the perceptual illusion of being physically located within a virtual environment, to create forms of audience engagement with news stories that fundamentally differ from the distanced observation characteristic of traditional text, photographic, and video journalism. De la Pena's foundational work, including *Hunger in Los Angeles* (2012), the first VR piece screened at the Sundance Film Festival, and *Project Syria*, commissioned by the World Economic Forum, demonstrated the potential for immersive technologies to create visceral, embodied encounters with distant realities that conventional media formats cannot replicate.

The theoretical promise of VR journalism rests on a compelling hypothesis: by placing audiences within the perceptual environment of a news story, immersive technologies can bridge the empathy gap that prevents distant events, particularly those affecting geographically, culturally, or socioeconomically remote populations, from generating the emotional engagement and political response that comparable domestic events would provoke. De la Pena and colleagues' (2010) foundational paper, the second most downloaded article in the history of the journal *Presence: Teleoperators and Virtual Environments*, articulated this hypothesis by drawing on presence theory, embodied cognition research, and journalism studies to argue that VR's capacity to generate place illusion and plausibility illusion creates a qualitatively different mode of news engagement with unique potential for fostering informed global citizenship.

However, the decade and a half since VR journalism's initial emergence has produced both enabling innovation and sobering evidence about the approach's limitations, sustainability challenges, and ethical complexities. This paper critically examines VR journalism through three interconnected analytical lenses: the technological and psychological mechanisms of immersive news engagement, grounded in presence theory and embodied cognition; the ethical tensions between empathetic engagement and potential manipulation, voyeurism, and representational harm; and the sustainability challenges that have led to what Cheng and Verboord (2025) describe as a stall in VR journalism adoption despite continued technological advancement. The

analysis draws on the emerging empirical literature, including experimental comparisons of immersive and traditional news formats, audience reception studies, and critical analyses of specific VR journalism productions, to evaluate VR journalism's realized and unrealized democratic potential.

Theoretical Foundations: Presence, Embodiment, and Immersive News Engagement

Presence Theory and the Phenomenology of Virtual Environments

Slater's (2009) influential theoretical framework, published in *Philosophical Transactions of the Royal Society B*, provides the foundational concepts for understanding VR journalism's distinctive psychological mechanisms. Slater distinguishes two components of the experience of being in a virtual environment: Place Illusion, defined as the strong illusion of being in a place in spite of the sure knowledge that you are not there, and Plausibility Illusion, defined as the illusion that the scenario being depicted is actually occurring, even though you know for sure that it is not. Place Illusion is generated primarily by the sensorimotor contingencies of the VR system, that is, the extent to which the system responds to the user's body movements in ways consistent with real-world perception. Plausibility Illusion depends on the extent to which the virtual environment includes events that relate directly to the participant, that the environment responds to the participant's actions, and that events unfold in a credible manner.

For journalism, the implications of Slater's framework are significant. Place Illusion enables audiences to experience the spatial context of a news story, the cramped conditions of a refugee camp, the devastation of a natural disaster, the atmosphere of a political protest, in ways that activate spatial cognition and environmental awareness rather than merely visual observation. Plausibility Illusion enables audiences to experience the events of a news story as occurring around them and potentially to them, activating emotional and physiological responses, including fear, sympathy, outrage, and urgency, that more closely resemble responses to directly witnessed events than to mediated representations. Together, these illusory experiences create what de la Pena characterized as the unique potential for immersive journalism to place the audience at the scene of the story.

Narrative Transportation and Embodied Cognition

Narrative transportation theory, as developed by Green and Brock (2000) in the Journal of Personality and Social Psychology, provides a complementary framework for understanding how immersive media engage audiences cognitively and emotionally. Transportation describes a convergent mental process in which attention, imagery, and emotional responses are focused on events occurring in the narrative world, reducing the cognitive resources available for critical evaluation of the narrative's claims. In traditional media, transportation is achieved through compelling storytelling, vivid imagery, and emotional engagement with characters. In VR journalism, the immersive medium itself generates transportation by surrounding the audience with the narrative environment, creating embodied sensory experiences that engage attention and emotion through perceptual mechanisms rather than purely imaginative ones.

The FINESSE framework, Foundations for Immersive Non-Fiction Narrative as Embodied Situated Simulation Experiences, extends embodied cognition theory to immersive journalism contexts, proposing that VR's unique journalistic potential lies in its capacity to engage bodily activity, multisensory information, and spatial cognition in the processing of news content. Unlike text or video journalism, which engage primarily visual and auditory channels, VR journalism can engage vestibular, proprioceptive, and spatial processing systems, creating forms of understanding that are embodied rather than purely cognitive. This embodied engagement has been hypothesized to produce more durable attitude change, stronger emotional responses, and greater behavioral intention to act on the information presented, though the empirical evidence for these hypothesized advantages remains mixed and contested.

Empirical Evidence: What Immersive Journalism Achieves and What It Does Not

Experimental Comparisons of Immersive and Traditional Formats

The empirical literature comparing the effects of immersive and traditional news formats has produced results that are more nuanced and less uniformly favorable to VR journalism than the technology's advocates initially anticipated. Perez-Seijo, Vicente, and Lopez-Garcia's (2023) between-subjects experiment with 104 participants comparing VR headset viewing with magic window viewing of El Pais 360-degree news content found that VR headsets significantly enhanced place illusion and co-presence but did not produce significant differences in

information recall or comprehension. This finding suggests that VR's experiential advantages, feeling present in the story's environment, do not automatically translate into informational advantages, remembering and understanding the story's content, raising questions about the format's utility for journalism's core informational function.

Bujic, Salminen, Macey, and Hamari's (2024) comparison of articles, 360-degree video, and VR for coverage of a refugee crisis found that immersive formats produced stronger negative emotional responses, including greater sadness, anger, and distress, compared to text-based coverage, but did not produce better content memory or comprehension. This emotional amplification without corresponding informational enhancement raises important ethical questions: is it journalistically responsible to produce stronger emotional reactions to news events if those reactions are not accompanied by better understanding of the events' causes, context, and implications? The risk is that immersive journalism creates emotional spectacle rather than informed engagement, generating visceral responses that may feel significant but that do not translate into the contextual understanding necessary for informed democratic participation.

A broader meta-analysis of immersive journalism research by Hernandez-Rodriguez and Garcia-Perdomo (2024), systematically reviewing 69 articles published between 2010 and 2021, found that the field is dominated by media effects and quantitative approaches, with limited attention to production practices, audience reception in naturalistic contexts, and the specific ethical challenges of immersive news representation. The review identified a significant gap between the theoretical claims made for VR journalism, including enhanced empathy, deeper engagement, and transformative understanding, and the empirical evidence available to support those claims, which remains insufficient to validate the most ambitious promises of immersive storytelling advocates.

The Empathy Hypothesis: Evidence and Critique

The claim that VR journalism uniquely fosters empathy, often summarized by de la Pena's characterization of VR as the ultimate empathy machine, represents the format's most prominent and contested value proposition. Martingano, Herrera, and Konrath's (2021) meta-analysis of empathy outcomes across VR studies found that VR experiences improve emotional empathy, the affective response of feeling what another person feels, but do not significantly improve cognitive empathy, the intellectual capacity to understand another person's perspective

and circumstances. This distinction has important implications for journalism: emotional empathy without cognitive empathy may produce sympathetic arousal without contributing to the contextual understanding that enables informed responses to the suffering depicted.

Critics of the empathy hypothesis raise several additional concerns. First, the assumption that empathy automatically translates into prosocial behavior, including political action, charitable giving, or policy support, is empirically questionable; empathy can produce paralysis, avoidance, or selective compassion as readily as constructive engagement. Second, the framing of VR as enabling audiences to walk in another's shoes has been criticized as epistemologically naive, suggesting that brief sensory immersion in a simulated environment provides genuine understanding of another person's lived experience, including its historical, cultural, economic, and political dimensions, in ways that risk trivializing the complexity of those experiences. Third, the production choices inherent in VR content creation, including camera placement, sound design, narrative framing, and environmental selection, shape the audience's experience in ways that may manipulate rather than inform empathetic response.

The Sustainability Challenge: Why VR Journalism Has Stalled

Despite continued technological advancement, including improvements in headset comfort, visual quality, and content creation tools, VR journalism production has significantly declined from its peak of experimentation during the 2015 to 2018 period. Cheng and Verboord's (2025) analysis using Rogers' Diffusion of Innovations framework found that VR journalism adoption has stalled at the early adoption stage, with only approximately 6 percent of media organizations having fully incorporated VR into routine news production. The New York Times' Daily 360 project, which produced a new 360-degree video every day for over a year, was discontinued; the NYT's dedicated VR app went inactive in 2019; and many newsrooms that experimented with immersive formats have scaled back or eliminated their VR production capabilities.

Several interconnected factors explain this stall. First, production costs for high-quality VR journalism remain substantially higher than for traditional video, requiring specialized equipment, technical expertise, and extended post-production processing that strain the already depleted budgets of most news organizations. Second, audience access remains limited by hardware requirements: while smartphone-based 360-degree viewing provides a degraded immersive experience without dedicated headsets, the installed base of consumer VR headsets

remains small relative to the audiences that news organizations need to reach for commercial sustainability. Apple Vision Pro, launched in February 2024 at \$3,499, reportedly ceased production by year's end due to weak consumer demand. Third, the lack of clear audience demand for immersive news content, documented in audience surveys showing limited willingness to adopt new technologies for news consumption, undermines the business case for continued investment.

Fourth, the rapid evolution of consumer media preferences toward short-form video on platforms like TikTok and Instagram Reels has created a competitive attention environment in which the extended, dedicated engagement required by VR experiences is increasingly difficult to sustain. VR journalism requires audiences to don hardware, commit to sustained attention, and engage with emotionally demanding content, all of which run counter to the ambient, fragmented, and entertainment-oriented media consumption patterns that dominate contemporary digital culture.

Ethical Dimensions of Immersive News Representation

Manipulation, Voyeurism, and the Boundaries of Appropriate Immersion

The ethical challenges of VR journalism center on the relationship between immersive engagement and the potential for manipulation, voyeurism, and representational harm. The very qualities that make VR journalism psychologically powerful, its capacity to generate intense emotional responses through embodied presence in the story environment, also make it particularly susceptible to ethical misuse. When audiences experience intense emotional arousal in response to immersive content, their capacity for critical evaluation of the content's truthfulness, completeness, and fairness may be diminished, creating conditions in which audiences are more vulnerable to framing effects, emotional manipulation, and selective representation.

The voyeurism concern arises from the specific phenomenology of VR presence: feeling physically located within a scene of suffering, displacement, or conflict creates experiences that may cross the boundary between journalistic witnessing and exploitative spectatorship. When audiences experience place illusion in a refugee camp, a hospital ward, or a conflict zone, their sense of being there creates a relational dynamic with the depicted subjects that conventional journalism mediates through the professional distance of the journalist as intermediary. The

removal of this mediating distance raises questions about informed consent from subjects depicted in immersive environments, about the psychological impact on audiences exposed to traumatic content through immersive modalities, and about the commodification of human suffering for immersive media experiences.

Informed Consent and Subject Agency

The informed consent challenges of VR journalism are distinct from those of traditional video journalism. When subjects consent to being filmed for a news report, they consent to a specific representational modality, a framed, edited video viewed on a screen, that they can reasonably anticipate and understand. When the same footage is incorporated into a VR experience, the representational modality changes in ways that subjects may not have anticipated: audiences may feel as though they are standing in the subject's home, walking through their neighborhood, or witnessing their most vulnerable moments from an intimate proximity that traditional video does not create. Whether consent to traditional video recording constitutes consent to immersive representation is an ethical question that current practice does not consistently address.

The agency of subjects in VR journalism is also constrained by the production process. Unlike participatory documentary forms that enable subjects to contribute to or influence their own representation, VR journalism production is typically controlled entirely by the production team, who determine camera placement and therefore the audience's perspective, environmental design, sound design, narrative structure, and the specific moments of the subject's experience that are captured and presented. The resulting immersive representation may feel authentic to audiences but is no less constructed than traditional documentary, with the added ethical concern that the illusion of unmediated presence may obscure the constructedness of the experience.

Alternative Immersive Formats: AR, Audio, and Hybrid Approaches

The limitations and sustainability challenges of VR journalism have prompted exploration of alternative immersive formats that may offer some of VR's engagement benefits while addressing its practical and ethical limitations. Augmented reality journalism, which overlays digital information onto the physical environment through smartphone screens or AR glasses, offers immersive data visualization, spatial storytelling, and contextual information presentation without requiring dedicated headset hardware or the fully enclosed virtual

environments that VR demands. Pavlik and Bridges' (2013) foundational monograph on augmented reality journalism mapped the potential applications across news visualization, spatial data reporting, and contextual information layers, and subsequent developments including the New York Times' AR features and Snapchat's AR news integrations have demonstrated the format's viability within existing consumer technology ecosystems.

Immersive audio, including binaural recording, spatial audio, and immersive podcast production, represents another alternative that leverages auditory immersion to create experiences of presence and emotional engagement without visual technology requirements. The dramatic growth of podcast consumption, with 15 percent of U.S. respondents listening to news-related podcasts in the past week according to the Reuters Institute's 2025 data, and 73 percent of podcast listeners reporting that podcasts helped them understand issues more deeply than other media, suggests that audio-based immersive experiences can achieve meaningful engagement without the hardware barriers, production costs, and ethical complications of visual VR. Sharon's (2023) research agenda for podcast studies in the *Annals of the International Communication Association* identified spatial audio and immersive podcast production as emerging research frontiers with significant journalistic potential.

Discussion and Future Research Directions

This paper has examined VR journalism through the intersecting lenses of presence theory, empathy research, sustainability analysis, and media ethics, finding that immersive storytelling's theoretical promise significantly exceeds its demonstrated empirical impact, commercial sustainability, and ethical manageability in current implementations. The documented effects of immersive journalism, including enhanced place illusion, increased emotional response, and heightened subjective engagement, are genuine but limited: they do not consistently translate into improved information retention, deeper contextual understanding, or demonstrable prosocial behavioral outcomes. The sustainability challenges facing VR journalism, including high production costs, limited audience access, weak consumer demand, and competition from short-form video formats, suggest that fully immersive VR is unlikely to become a routine news format in the near term.

Future research should investigate several critical questions. First, how do different degrees of immersion, from 360-degree video on smartphone screens to full six-degrees-of-freedom VR with haptic feedback, affect the balance between emotional engagement and critical

evaluation that ethical journalism requires? Second, how can production practices be developed that maintain journalistic standards of accuracy, fairness, and informed consent within immersive formats? Third, what role can alternative immersive formats including augmented reality, spatial audio, and hybrid mixed-reality approaches play in delivering some of VR journalism's engagement benefits while avoiding its most acute sustainability and ethical challenges? Fourth, how should emerging spatial computing technologies, including Apple Vision Pro's successors and Meta's Quest platform, be evaluated as potential journalism distribution channels, and what governance frameworks should apply to news content experienced in immersive environments?

Conclusion

Virtual reality journalism embodies both the ambition and the limitations of technological innovation in democratic media. The ambition, to create forms of news engagement that bridge empathy gaps, transcend geographical distance, and produce embodied understanding of distant realities, is genuinely valuable and aligned with journalism's democratic function of enabling informed citizenship in an interconnected world. The limitations, including mixed empirical evidence for the most ambitious effectiveness claims, significant sustainability challenges, unresolved ethical tensions around manipulation and consent, and competition from more accessible media formats, require honest acknowledgment rather than continued promotional optimism.

The most productive path forward for immersive journalism involves neither wholesale adoption nor wholesale abandonment but rather selective deployment in contexts where immersion's distinctive strengths, spatial understanding, environmental awareness, embodied emotional engagement, align with specific journalistic purposes, combined with continued development of alternative immersive formats that offer engagement benefits within more sustainable production and distribution frameworks. The ethical challenges of immersive news representation, particularly regarding informed consent, the manipulation potential of presence-induced emotional arousal, and the risk of voyeuristic spectatorship, require the development of profession-specific ethical guidelines that extend existing journalism ethics frameworks to address the distinctive phenomenology of immersive experiences. Whatever VR journalism's ultimate role in the media ecosystem, the questions it raises about the relationship between

technological mediation, embodied experience, and democratic knowledge will remain central to journalism studies in the decades ahead.

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