



STORYLIVING:
AN ETHNOGRAPHIC STUDY OF HOW
AUDIENCES EXPERIENCE VR AND WHAT
THAT MEANS FOR JOURNALISTS

Abstract

Over the past few years, we've seen the rise of a new medium for storytelling in journalism: virtual reality (VR). But as VR technologies continue to evolve, significant questions remain on how best to use VR to tell stories in a journalistic context.

This paper uses ethnographic research to help journalists develop a better understanding of how to tell stories in VR. It provides insights on what makes VR a distinct storytelling medium, what makes VR alluring to audiences, and what that means for how journalists can produce compelling experiences in the medium.

The study found that what makes VR distinct as a medium is that it 1) conveys the sense that the viewer is "living" the story as opposed to being told it ("storyliving" rather than "storytelling"); 2) allows viewers to expand their perspective and "shapeshift"; and 3) leaves viewers with powerful emotional experiences. The study found that VR is alluring because it provides audiences the opportunity to participate in a story, seek out specific emotional states, and embody someone or something else.

For storytellers and journalists looking to work in VR, the study recommends 1) conveying an emotional impression, even at the expense of conveying specific information; 2) playing with perspective in new ways and creating opportunities for participation; and 3) taking into account the heightened vulnerability of subjects when constructing a storytelling experience.

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1. Introduction

In 2016, the John S. and James L. Knight Foundation commissioned

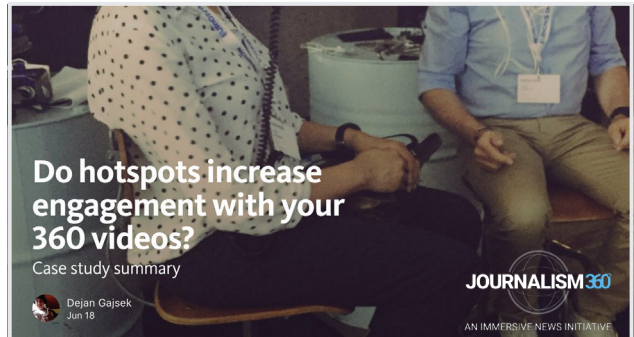
a research study called “[Viewing the Future? Virtual Reality in Journalism.](#)” The study showcased VR as an important medium for journalism and highlighted the growing desire of journalists to inform and connect with audiences in new ways. The report also drew attention to the significant barriers to producing VR journalism, including the cost of production, the accessibility of headsets, and questions around ethical and storytelling challenges.

Earlier this year, the Reuters Institute for the Study of Journalism published “[VR for News: The New Reality?](#),” an exploration of the challenges news organizations face in further integrating VR storytelling into their newsrooms. The report found that challenges remain in how newsrooms invest in VR, create great content experiences, improve hardware and shared platforms, and encourage audience participation and monetization.

1. INTRODUCTION

Our study focuses on the storytelling challenges of the medium by exploring how people experience VR storytelling and what makes it distinct as a medium. For the past six months, the [Google News Lab](#) has conducted an ethnographic research study to explore these questions in depth.

This study serves an important role in the Google News Lab's broader efforts in the field of immersive storytelling. We've provided journalists with in-person training in new VR tools, convened coalitions like [Journalism 360](#) to accelerate immersive storytelling in journalism, and helped produce lighthouse VR projects like [The Guardian's "6x9"](#) piece to inspire the industry. Developing a more rigorous understanding of how VR storytelling affects those who experience it and using those insights to inform how to approach storytelling and reporting in the medium are critical to that work – and constitute the focus of this study.



From top left to bottom right: The Guardian's "6x9", Journalism 360, Jump, Google Cardboard, New York Times Cardboard.

2.

Methodology & Terminology

ETHNOGRAPHIC RESEARCH

This paper’s findings are based on an in-depth ethnographic study of VR consumers and creators. Ethnography is a unique method of qualitative research for discovering an interviewee’s articulated and unarticulated (often symbolic) relationship to a product or experience. In total, 36 ethnographic interviews were conducted with a diverse range of participants, varying across age, gender and ethnicity [Figure 1]. The interviews were conducted in three markets: New York City, Chicago and the San Francisco Bay Area. Additional observational research was conducted at the Google News Lab Summit in Mountain View, California, and at a virtual reality arcade in Brooklyn.

| LOCATION | TOTAL | GENDER | AGE | ETHNICITY | EDUCATION |
|----------|-------|----------|-----------------------|---|--|
| NYC | 12 | 9 M, 3 F | 22–50 yrs Mean: 35 | 9 Caucasian 1 Hispanic 1 African American 1 Asian | 4 Some College 6 College Grad 1 Postgrad 1 No Response |
| SF Bay | 7 | 5 M, 2 F | 23–48 yrs Mean: 36 | 4 Caucasian 1 Hispanic 1 African American 1 Hispanic/Asian | 4 Some College 1 College Grad 2 Postgrad |
| Chicago | 8 | 5 M, 3 F | 26–48 yrs Mean: 41 | 5 Caucasian 1 Hispanic 2 African American | 1 High School Grad 2 Some College 4 College Grad 1 Postgrad |

Figure 1. Consumer Interview Participant Breakdown

2. METHODOLOGY & TECHNOLOGY

Twenty-seven of the interviews were conducted with “early adopter” consumers. These interviews lasted between three and three and a half hours and were designed to surface insights on consumers’ experiences of the new medium, as well as the desires that drove them to purchase VR technologies, headsets and systems. In addition to participating in formal interviews, these consumers played their favorite VR pieces and discussed the benefits the experience provided them. Finally, they were given headsets with specific pieces of VR content to experience onsite (“Clouds Over Sidra,” The New York Times’ “The Winning View from Chicago” Daily 360, Birdly, “Cosmic Sandbox,” Tilt Brush and “Waves of Grace”) to surface additional interview responses and observations.

The remaining nine interviews were conducted with established creators and critics in the fields of VR journalism and entertainment [Figure 2]. These interviews lasted between one and two hours and focused on the formal, theoretical and business dimensions of the emerging field of virtual reality. By interviewing both consumers and creators, we were able to capture a more holistic understanding of the current state of virtual reality entertainment and journalism.

| NAME | POSITION | ORGANIZATION |
|-------------------|------------------------------------|----------------------------|
| Dan Archer | Founder | Empathetic Media |
| Ola Björling | Global Director of VR | MediaMonks |
| Jessica Brillhart | Principal Filmmaker for VR | Google |
| Robert Hernandez | Professor | USC Annenberg / JOVRNALISM |
| Sarah Hill | CEO | StoryUP VR |
| Marcelle Hopkins | Executive Producer for 360 News | The New York Times |
| Matt Lorrain | Technologist | Google |
| Ken Perlin | Founding Director | Media Research Lab, NYU |
| Tom Small | Manager of New Technology Programs | YouTube Spaces |

Figure 2. Creators and Critics Interview Participant Breakdown

2. METHODOLOGY & TECHNOLOGY

NOTE: Developing consistent terminology is essential for any emerging field of cultural and technical production. This is particularly true in immersive storytelling, where the term “virtual reality” has been understood by practitioners, academics and users in a number of different ways.

Many practitioners have argued for a clear-cut distinction between 360 live-action video and computer-generated content (Damiani, 2016). However, based on our interviews with consumers, we found that the term “virtual reality” was consistently used by them to refer to both forms of content. Consumers see the two formats along a spectrum of VR experiences. The benefits of using a broader definition are that it allows us to map formal qualities shared across 360 video and CG content and that it privileges the popular perceptions and understandings of consumers over the opinions of experts. Reflecting that broader definition, we are able to broaden our definition of VR to include interfaces that increase interactivity, such as hand controllers, sensors and camera tracking, and other devices.



Google's Daydream headset gets tested.



3. Findings

“*It’s electric. You cannot duplicate something like that. It’s exhilarating. You’re connected to everyone who is there.*”

— Andrew, 50, of NYC, responding to “The Winning View from Chicago” by The New York Times, The Daily 360

The findings here are framed to provide a deeper understanding of how consumers process VR, what makes the medium distinct, and its implications for journalists and other storytellers working in the medium. **We’ve organized those findings into the following three sections:**

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- A** | ***Becoming Virtual: Storyliving, Shapeshifting and Emotional Authenticity***
How do people experience VR? What makes it distinct from other forms of storytelling?
 - B** | ***The Lure of the Virtual: Participation, Emotional Management and Embodiment***
What makes VR alluring to audiences?
 - C** | ***Creating Virtual: Emotional Resonance, Playing with Perspective and Embracing Vulnerability***
What does the study mean for storytellers and journalists looking to produce content in VR?
What factors are important to consider for effectively communicating in an immersive medium?
-

3. FINDINGS: BECOMING VIRTUAL

A **BECOMING VIRTUAL:** STORYLIVING, SHAPESHIFTING AND EMOTIONAL AUTHENTICITY

“ I think when we’re saying ‘storytelling’ we’re putting on a cognitive toolbelt that belongs to a different medium. There is no teller in this sense, because it is a direct sensory experience. The storytelling is the retelling or reenactment of something that happened to someone else or something else, before. But VR is happening to you, here and now. I’m not saying ‘storytelling’ is a forbidden word, but using it anchors us into something that VR isn’t.”

– Ola Björling, Global Director of VR, MediaMonks

The study explored how audiences experienced VR and what made the medium distinct for them. Three key themes surfaced from our conversations with research participants:

1. VR as a form of storyliving rather than storytelling
2. The viewer’s ability to shapeshift and expand perspective through VR
3. VR’s ability to leave viewers with strong emotional experiences

“ I feel more in control, more than in non-VR content. I have freedom to explore different aspects of the space... I’m also interested in things that are not in the story. What else can I see that’s not part of the story?”

– Andrew, 50, of NYC

STORYLIVING RATHER THAN STORYTELLING

A significant formal shift from traditional storytelling mediums to VR is that “telling” is less central to a VR experience. The audience learns through engagement and embodiment, by entering into a scene, inhabiting a digital entity, and experiencing what it knows. Viewers experience the story as though they lived it. This is consistent with an understanding of VR as *storyliving*.

The term *storyliving* is derived from a rich body of anthropological research on the concept of the “lived story.” Multiple cross-cultural studies (Emigh, 1996; Maschio, 1994; Gell, 1975) have identified social practices of people enacting or performing as mythical or spiritual figures to bring about perceptual transformations. Central to this process is a sense of *dual unity* (Keeler, 2017; Emigh, 1996; Leenhardt, 1979) in which the performer identifies with mythical entities while still retaining a sense of their own identity.

3. FINDINGS: BECOMING VIRTUAL

This notion of dual unity surfaced throughout the interviews we conducted. Mike M., an experienced gamer (34, of NYC), stated, “For me, it’s like your character is the only thing that’s important... You look down and you have this utility belt. You can take items out of it. You are the character.”

Dual unity presents a number of specific effects for audiences. They may feel a sense of agency but do not feel total control. They feel heightened vulnerability of their bodies to both the virtual experience and the real world, while not feeling entirely divorced from their surroundings. There is a cognitive dissonance in which audiences are still aware of their bodies in the present space, while fully participating in the virtual. Their body exists in a *liminal* space between two worlds (Turner, 1966/1995). The viewer is neither fully there nor fully here, but straddling the divide through perceptual gymnastics between the two spaces.

Dual unity in storyliving is also critical to how we conceive the narrative structure in a VR experience, pivoting from a traditional linear three-act structure (composed of a beginning, a middle and an end) to three experiential phases.

1. **INITIATION:** The viewer becomes accustomed to his or her new environment and embodies a new form. The initial immersion may not offer narrative density but provides richly complex and embodied sensory information that can leave a deep mark on the viewer’s body and mind. As one interviewee, Steve (44, of SF Bay Area), claimed, “You cram more into shorter periods of time... You get more down in six minutes rather than 30 minutes in standard form.” The amount of unconscious and embodied information related to the lived experience far exceeds that of a traditional film or journalistic piece.
2. **EXPLORATION:** Once the viewer has been initiated, he or she explores the space, sometimes beyond the narrative, to seek out salient details. Emboldened by this sense of agency, he or she acts on their instincts and finds pleasure in their sense of control. Their body is the central medium for interacting with and finding significance in the virtual space.
3. **MAKING SENSE:** As the experience concludes, the viewer transports back to reality and seeks meaning from their VR experience. He or she draws on prior life experiences, seeks out information to provide additional context, and incorporates the perspective they’ve experienced into their worldview.

This structure for how to think about a VR experience is one of the ways VR differs significantly from other forms of storytelling, and it’s critical to our broader discussion of how content creators should approach the medium.

3. FINDINGS: BECOMING VIRTUAL

SHAPESHIFTING AND EXPANDING PERSPECTIVE

“It is a shapeshifting device. I can become a rat, a helicopter or another person — and that is a new feeling, something that happens in dreams... If you think of a lumberjack chopping down a tree, you see him in your mind, you visualize him. And then, you get closer and you enter into his eyes. You enter into his body. And then you become the one chopping the wood... If you're an eagle you can fly... And I think that the advantage is learning. I can learn when I do that. I can learn firsthand.”

– Cooper, 23, of San Francisco

The power of storytelling often lies in its ability to change how audiences see the world, by exposing them to new geographies, peoples and perspectives. VR offers new forms of embodiment that viewers temporarily identify as their own, a concept we touched on earlier when describing dual unity.

This ability to induce a sensation of *embodiment* in VR has a profound effect on expanding perspective. For instance, VR experiences can help audiences shapeshift into nonhuman entities and push the normal limitations of perspective. The dramatic impact of this experience, the striking moment of feeling oneself inhabiting something entirely alien, can “shock” the mind out of complacency and prepare it to begin absorbing a new perspective.

But the process is even more profound. People who use high-end VR devices, like the HTC Vive or the Oculus Rift, say their bodies “remember” the way they moved while embodying the digital character even after the storytelling experience was completed. The highest-end VR systems can intensify this effect. Birdly, for example, is a VR system that allows participants to experience flight by lying atop a hydraulic rig and flapping their arms like a bird. The system adjusts with the physics of the experience to create the physical sensation of flight. But even with less elaborate experiences, whether it's the shifting perspective of 360 drone footage or extreme angles, VR presents alternative embodied viewpoints of the world.

A number of recent studies have strengthened this argument, showing that humans possess the neural plasticity to imagine themselves into and perform within nonhuman bodies. Researchers at Stanford University's Virtual Human Interaction Lab have called the phenomenon *homuncular flexibility* (Won et al., 2015), which is the ability of the mind to inhabit and control nonhuman bodies. The *homunculus* refers to the motor and somatosensory parts of the brain that link the human body back to the mind. It is the internal representation of the body in which one makes sense of oneself. A number of projects and studies have included turning participants into a virtual cow (Ahn et al., 2016), lobster (Won et al., 2015) or [tree](#).

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A man tries Birdly, a simulator that gives the user the feeling of flying.



His view inside Birdly.

These experiments have also shown that through simple controllers, humans were able to control the multiple arms of a lobster avatar or a perceived tail of a virtual creature (Won et al., 2015). This ability to shapeshift and assume an expanded perspective can induce users to identify with even nonhuman entities. This phenomenon is important to the broader discussion of how VR can stretch perspective and its ability to help make obfuscating or complex topics more tangible. For instance, research has shown that the ability to shapeshift can help users better understand issues like climate change (Ahn et al., 2015; Wells & Lekies, 2006).

“ I recently read *‘The Great Thirst,’* which is about water in California. And I think that the potential to share a history lesson in virtual reality, but really experience the infrastructural layout of a place, is really exciting to me.”

– Cooper, 23 of San Francisco

As Ahn et al. (2016) explain in a recent report, exposure to information related to ecological or environmental issues is often not enough to change human behavior. There is a conceptual disconnect between threats to the individual and larger systemic issues that unfold over a long period of time. But by inhabiting and embodying virtual ecological entities, such as a bird in an oil spill (Berenguer, 2007; Servillano et al., 2007), viewers were able to form stronger mental overlaps with nonhuman entities and change their opinions about environmental issues. Moreover, Ahn et al. (2016) found that when long-term issues were compressed into a shorter experience, users were able to better conceptualize the impact of human activities on the environment. So shapeshifting offers not only novel, whimsical experiences, but also *profoundly new perspectives* that have the ability to change opinions and behaviors.

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“ The old narrative frame does not exist in our actual physiology. We have been stuck with this frame or cage (of perception) for so long, since Renaissance times, representing three dimensions on a two dimensional plane. But you can now do magic in three dimensional VR space (without that frame)... (why keep using the same story making conventions?) a new medium does not come about everyday.”

– Tom Small, VR Manager at YouTube Spaces

This ability to deepen perspective is important to evaluate in the historical context of the evolution of storytelling. In the pre-Renaissance period, the realism of landscapes and the individualities of people were deemed secondary and there was little effort to create the illusion of depth (whether spatial or emotional depth). Figures depicted were largely symbolic and illustrated religious principles, removed from the human realm, rather than focusing on and portraying human concerns, events and emotions. By the early 15th century, painters began to create a sense of three-dimensional depth in their paintings by employing the mathematical principle of the *vanishing point* (Berger, 2008; Andrews, 1995; Baxandall, 1988). During the Renaissance, this technique became ubiquitous, as did a commitment to creating and exploring the human world with enhanced perspective. VR represents the most recent shift in that continuum, and highlights the importance of perspective to better understanding other people, events and places.

EMOTIONAL AUTHENTICITY AT THE EXPENSE OF NARRATIVE CLARITY

“ It’s an eye-opening experience for me. It gives you a sense of scale. You understand, but never could personally perceive how the universe works. You’re told it, you’ve seen videos about it, but when you’re in a virtual experience and you’re seeing it, understanding distance and size and how small Earth is amongst all these other planets, it really is a grounding experience.”

– Mike O., 36, of NYC

The study also surfaced that VR is distinct from other mediums in its ability to leave viewers with strong emotional responses, although sometimes at the expense of conveying specific pieces of information.

The feedback from the interviews emphasized the emotional dimensions of the story being told, whether it was about a mother trying to feed her family dinner (“Clouds Over Sidra”) or the solitude and loneliness

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expressed by the work of Van Gogh (Van Gogh app). In reaction to the “Air Force Special Operations” VR experience, Scott (32, of NYC) said, “You just feel the sheer craziness of skydiving; you feel it in the pit of your stomach.”



“Clouds Over Sidra,” a VR film created by Gabo Arora and Chris Milk. A Vrse.works production.

VR’s ability to deliver compelling emotional experiences increases as audiences receive high-fidelity audiovisual and haptic (relating to the sense of touch) feedback aligned with their virtual actions. The experience of living a story conveys an aura of authenticity, especially for stories with a journalistic bent. As Desiree (32, of SF Bay Area) mentions, “It is coming from the source, better than a movie, or a news article, which [is] staged... Here you get it from the source. You know it is accurate.”

The consumer’s total immersion, however, can take them away from narrative backstory or higher-level contextual information.

Interviewees often struggled to recount details from the experiences. After respondents had experienced a VR piece, they would often attempt to make sense of their experience by seeking out additional context around the story. This was because the narrative was often overshadowed by the immersion itself, with the viewer’s primary focus remaining on being present in that space and time.

As a result, viewers were left with a sense of the experience that was more impressionistic. One interviewee responded to a piece by remarking, “The different landscapes of the VR world blend with the forward movement of the piece, of time. I was focusing on where the family was having dinner, and then in the computer room... You need a couple of minutes to absorb things, to have things wash over you.” In this sense, users’ impressions of a virtual reality experience are akin to memory, with moments from a VR story processed and consumed as lived experience. Stories were also remembered through their poetic elements, tied to the memory of the story, its events and its characters.

3. FINDINGS: THE LURE OF THE VIRTUAL

B THE LURE OF THE VIRTUAL: PARTICIPATION, EMOTIONAL MANAGEMENT AND EMBODIMENT

“ It makes it feel real. Like a phenomenon. The suspense comes in when you’re walking through, but you don’t know what’s next. I’m excited, I don’t know what’s next. You’re a part of it.”

– Ericka, 28, of NYC

The study surfaced a few themes for why VR was alluring for consumers and creators:

1. A storytelling experience that moves beyond immersion to enable participation
2. Use of the medium as a tool to seek out specific emotional states
3. The ability to experience a pure sense of presence and embody another entity

“ In a novel or movie you are not really there. It is an interpretation. You have to picture it in your imagination to understand what it (the experience) would be like. And then you think, ‘[Am I] really picturing what the author is describing?’... If you are playing a game in VR, it is like you are the character you were trying to control in a non-VR game. In VR, you are the character.”

– Ericka, 28, of NYC

THE ABILITY TO PARTICIPATE

The experts interviewed for the study used the word “immersion” to describe the experience a user has in a VR story. However, as we’ve discussed, our research participants actually described the experience as “living a story” and “participating” in it. While a person can be immersed in a novel or a television storyline, there is rarely ever a sense that one is actually directly “living” the story communicated in the narrative. This ability to go beyond “immersion,” experience a “sense of total freedom,” and actually participate in the story was what made VR alluring for many of our subjects. As participant Shira (28, of NYC) says, “There is much more freedom for me in the VR experience. I’m deciding where I can go, and it feeds into my natural curiosity.” For many, participating in the story felt like an “emotional event” and was what attracted them to the experience.

3. FINDINGS: THE LURE OF THE VIRTUAL

The notion of “interactivity” or “participation” as a key differentiator of VR from other storytelling mediums like literature and cinema is reflected in the broader research around the topic. In 1999, literary and media theorist Marie-Laure Ryan argued that interactivity breaks immersion in novels and films because it draws attention to the medium itself, releasing the audience from their suspension of disbelief. In contrast, VR utilizes interactivity to deepen the sense of immersion into something wholly different: participation.

“***I don't even care about baseball but I wanted to cry when I saw that. And a lot of people had that reaction. They felt the joy that other people experienced. The New York Times was covering that game in so many other different ways: play-by-play, etc... but this emotional experience was only something that VR/360 could bring... We want to capture only those parts of the story where VR is additive.***”

– Marcelle Hopkins, Executive Producer for NYT VR, responding to “The Winning View from Chicago” by The New York Times, The Daily 360



Screenshot of “The Winning View from Chicago.”

Our interview feedback further emphasized the importance of participation when users stressed a preference for “discovering meaning for themselves.” Kishore (35, of NYC) remarks, “It’s the only medium I’ve tried where I start with a blank canvas. You can go in any direction you want. It’s extremely powerful. You are creating your own world.” This sense of agency emboldens and inspires audiences to take ownership of their experiences. As Andrew (50, of NYC) explains, “I feel more in control, more than in non-VR content. I have freedom to explore different aspects of the space... I’m also interested in things that are not in the story. What else can I see that’s not part of the story?”

3. FINDINGS: THE LURE OF THE VIRTUAL

A TOOL FOR **EMOTIONAL MANAGEMENT**

Entering into virtual reality enables viewers to inhabit a space free from distraction. For study participants with busy personal or professional lives, this offered a sensory-rich space to experience solitude and connect with a specific set of emotions. In some cases, VR users consciously sought out particular emotional states they desired, utilizing their experience as a tool for *emotional management*.

Often, participants sought VR in order to escape stress and recover a sense of calm.

“ *Most of my world is home and kids, cooking and cleaning. [VR] gives me something just for me. If I want to go somewhere, I don't have to bring the kids with me. I can just put on my headset and travel where I want to travel to. And I feel like it's just me there and my oasis.*”

– Desiree, 32, of SF Bay Area

“ *I use VR for relaxation. I do a guided meditation app. I've always wanted to meditate, but my mind races. With VR, the sensory deprivation is there, so I can concentrate.*”

– Donna, 41, of Chicago

VR's effectiveness as a tool to manage stress has been corroborated in scientific studies. Recently, Dr. Jeff Tarrant (2016), a psychologist who specializes in neurotherapy, ran a study to explore the effects of VR experiences on meditation and mindfulness (Hill, 2016). Using a 19-channel EEG system to measure brain activity, he found that participants performing a 4-minute nature VR experience were particularly impacted in the brain regions tied to stress. They exhibited a decrease in “fast” brain activity (tied to gamma brainwaves) and an increase in “slow” activity (tied to theta and alpha brainwaves), which are associated with states of relaxation.

But many also loved fright VR apps, such as “Affected: The Manor,” so they could experience a sense of horror directly. In fact, the dissociative effect of VR allows it to be a dynamic tool in seeking out a variety of emotional states ranging from whimsy to horror.

3. FINDINGS: THE LURE OF THE VIRTUAL

THE ABILITY TO EMBODY AN ENTITY

VR offers the ability to convey a pure sense of presence (de la Peña et al., 2010). Many of the research participants reflected on the technology's ability to deliver a "direct moment" and allow the user to "be there." Viewers were able to be fully present, lingering over details and shifting attention to different aspects of the scene.



A participant plays a game in HTC Vive.



What he sees inside the virtual world.

3. FINDINGS: THE LURE OF THE VIRTUAL

The ability to directly experience a moment enables one of the other key factors that make VR alluring to audiences: the opportunity to embody another entity. Anthropological research has shown the powerful allure that embodiment has had for audiences in storytelling experiences across cultural and geographic boundaries. In Australia, Aboriginal individuals go on “walkabouts” constructed to allow them to feel as if they are the creatures and spirits referred to in sacred stories. In Hinduism, ritual specialists often enact and embody a cosmic character to experience “another dimension of reality.”

Research suggests why VR is uniquely positioned to deliver these experiences. Researchers have suggested that *proprioception* or the “unconscious perception of the world, based on the body’s position, movement and interaction with the world,” is complicated by VR experiences, which trick the body into believing it is elsewhere (Mine et al., 1997). The degree of proprioceptive displacement deepens with the amount of participation and interactivity the VR experience delivers.

It is important to note here that different VR technologies impact embodiment to varying degrees. 360 video uses spatialized audio and video to create the illusion of being in a particular body or space that is not the viewer’s own. Further along the sliding scale, the HTC Vive and the Oculus Rift create interactive environments in which controllers act as the viewer’s hands within a virtual world. Studies of interactive video games have shown that players are able to reach a “full experiential flow by linking perceptions, cognition, and emotions with first-person actions” (Mäyrä & Ermi, 2011). Especially after repeated uses, players are able to reach increasingly unconscious and automatic executions of the character or digital entity’s actions. Moving from first-person video games to the naturalistic interface and embodied state of VR deepens the cognitive link between the user’s actions in the physical world and those in the virtual.

The full participation of the Vive or Rift allows the viewer to enter into a virtual or digital entity’s body, to experience what that entity experiences, and to live the story of its life. The use of controllers in particular offers a greater sense of proprioception, as one’s body become cognitively convinced it is in the virtual space. A number of psychological studies have shown that the cognitive effects of virtual reality are quite profound in altering a sense of perceiving one’s embodied sense of reality (Slater & Wilbur, 1997). Multiple studies have used the “rubber hand illusion” (Yuan & Steed, 2010; IJsselsteijn et al., 2006) to show how participants can perceive actions on a rubber hand as being part of their own bodies. The use of virtual environments deepens the illusion of proprioception.

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C **CREATING VIRTUAL: EMOTIONAL RESONANCE, PLAYING WITH PERSPECTIVE AND EMBRACING VULNERABILITY**

What does this mean for journalists who want to produce compelling content in VR? What are the most important factors they should consider for effectively communicating in an immersive medium?

What makes VR distinct as a medium – the sense that the viewer is “living the story” as opposed to passively consuming it, its dramatic expansion of perspective, and its ability to deliver powerful emotional experiences – and what makes VR alluring to consumers – the opportunity to participate, to seek out specific emotional states, and to embody someone or something else – suggest three key takeaways for storytellers and journalists to consider when creating content in VR.

1. VR is effective when it’s focused on conveying an emotional experience
2. Journalism should play with perspective in new ways and create opportunities for participation
3. When constructing a story, content creators should consider the heightened vulnerability of viewers

“***You feel like you are sitting with the Italian restaurant owner and getting a sense of his surroundings and feeling what he has, putting his heart and soul into his place... You understand why he feels so strongly about the place... You get a sense of his world...***”

– Shira, 28, of NYC, responding to the YouVisit VR app

VR IS EFFECTIVE WHEN IT’S FOCUSED ON **CONVEYING AN EMOTIONAL EXPERIENCE**

Given that VR is about *storyliving*, not storytelling, content creators need to approach the medium with a different set of objectives than they would in a more traditional medium. Instead of focusing on communicating specific pieces of information during the experience, filmmakers should look to construct a scene that creates an emotional impression and facilitates deeper reflection after the piece is over.

For journalists, this makes VR a powerful medium to strengthen viewers’ emotional connection to a story. As Scott (32, of NYC) put it, “If you live or experience firsthand a story of injustice, if it is happening to you,

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the path to your moral center is much more direct than it would be if you were viewing a distant non-VR documentary on the same subject. It's one thing to see a starving child in South Sudan in a documentary and say, 'Oh, that's just too bad,' and then turn away, or switch the channel. It's another to be locked in your VR headset and be right there with that child – to be immersed in that scene.”

For many storytellers, especially journalists, this can be a significant challenge, having developed their storytelling skills in well established linear formats. It forces storytellers to cede the conventional authority of a “storyteller.” It can also pose the risk that the journalistic mandate for rational, fact-based storytelling is overshadowed by something more experiential and emotional. As Dan Archer, Founder of Empathetic Media, explains, “The way in which the medium engages people with dramatic imagery and the sense of presentness can be problematic for journalists whose primary mission is to inform and create a sense of newness and engagement. Immersion is there, however, but cognitive engagement is not.”

Journalists prefer curated content and “want to tell a story.” But VR makes it more difficult to do this; it is difficult to front-load text-based narrative information or push users to particular logical conclusions with a VR piece. As Marcelle Hopkins, Executive Producer for NYT VR, asserts, “You can't give backstory in VR. It doesn't work. People tend to wander away from the narrator's voice, not remembering what was said... and you can't give historical context because...it's all about the here and now.” To lean into the medium, journalists “should deliver an experience,” relying less on evidence and source material as the building blocks of the story they're looking to convey.

This emphasis on creating an impression as opposed to communicating information has a few additional effects on how journalists can tell stories in the medium. Journalists do not need to tell stories linearly with a clear beginning, middle and end. Reflecting the conceptual framework we shared during our discussion of storyliving (*initiation, exploration and making sense*), journalists can create content that moves around from moment to moment or feels more impressionistic.

JOURNALISTS CAN **PLAY WITH PERSPECTIVE IN POWERFUL NEW WAYS**

Conveying perspective by encouraging readers and audiences to see a story through someone else's eyes has always been essential to good journalism. VR can empower journalists to play with perspective in compelling new ways. As Dan Archer mentions in his discussion of “Yo Sobreviví,” an immersive experience of the Colombian conflict, “skillful content creators fasten on this metaphor of VR perspective as they develop a piece. In the Colombia story, we are taking three different perspectives on the story, and users can choose one of the three and follow their recounting of the conflict.” This ability to provide

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multiple perspectives — and even flip between differing perspectives — can lead to a more holistic understanding of a complex issue or topic.



In "Peace in Colombia," Dan Archer uses VR to show the viewer the story from different perspectives.

VR's effectiveness with broadening purpose should encourage journalists to broaden the subjects they choose to construct immersive experiences about. For instance, VR's ability to help viewers identify with non-human entities offers an opportunity for journalists to create stories about complex systems (e.g., the internet of things) or phenomenon (e.g., climate change). It also audiences to participate in unprecedented ways. For instance, programs like The Cosmic Sandbox allow users to construct entire solar systems and other cosmic phenomena. But it's not difficult to imagine journalists being able to apply a similar approach to topics that are less academic and more journalistic.

As we've shown, VR's ability to play with perspective can also have profound effects on the user's view of an issue. In 2013, a study from Ahn, Le and Bailenson showed that when participants experienced a virtual simulation of impaired vision, their opinions about disabled people changed profoundly and lasted days after the study was concluded. A Stanford study by Yee and Bailenson (2007) showed that a similar effect was found when studying the participants' ability to identify with and change their behavior based on race, age, sex and height. Work by Nonny de la Peña has focused on making 3D recreations of news events to foster empathy and change audiences' opinions about contemporary issues. She and her co-authors

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(2010) assert that VR “offers a profoundly different way to experience the news, and therefore ultimately to understand it in a way that is otherwise impossible, without really being there.”

Shifting one’s self-representation across physical, social and cultural divides creates an opportunity to incorporate new perspectives and widen one’s worldview – and gets to the heart of what quality journalism often does best.

WHEN CONSTRUCTING STORIES, CONTENT CREATORS NEED TO **TAKE INTO ACCOUNT THE HEIGHTENED VULNERABILITY OF THE VIEWER**

“*The word that I attribute to the VR phenomenon almost more than any other is ‘vulnerability’ because you’re in this place, in this remove, and it’s you and the image. It’s the two of you and that is the place where the image can wound you, in a sense, because you’re neither there nor here... Like when you’re in a relationship or something, you have to be vulnerable in a way. You have to be open to what’s going to happen.*”

– Cooper, 23, of San Francisco

VR experiences put viewers in a state of vulnerability – both physically and emotionally. The viewer’s body is vulnerable to the actual surroundings while he or she is immersed within the virtual space, causing a cognitive shifting between the two realities. Users are often surprised or shocked when entering the virtual experience, introducing mental and physical vulnerabilities. Additionally, reintegration into the real space at the end of the experience is a profound transition, one that is crucial for concluding the experience and making meaning out of it.

Journalists should be mindful of the need to sensitively facilitate the viewer’s initiation into and exit from a VR experience. Users become vulnerable to the narrative experience as well, due to the sensory deprivation – and replacement – triggered by the totality of the auditory and visual experience. As Steve (44, of SF Bay Area) mentions, “Your senses are so attuned. When you are in that environment, you’re uncomfortable... It juices you up. You have to be very attuned and aware.”

The sensory richness can both heighten the experience and trap the user within it. There is no looking away from the screen when the image fully surrounds you.

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“ For example, in the *Falluja* [piece], I wasn't thinking about the larger scope of geopolitical context. I was much more focused on the emotional attachment I had to those eyes I was looking through. The potential of violence – that took the forefront.”

– Cooper, 23, of San Francisco



"The Fight for Falluja," by The New York Times, puts you inside the Iraqi forces' fight against ISIS.

Experiencing a journalistic piece like “The Fight for Falluja,” one feels the vulnerability of being a soldier in battle. Unlike the two-dimensional frames in traditional journalism, VR opens the representation to the full depth of one’s surroundings, exposing the possibilities of danger from every direction. In turn this opens the viewer to a deeper embodied sense of the soldiers’ experiences and the possibility of complex emotional identification (de da Peña et al., 2010; Ahn et al., 2013). But it also increases the burden on journalists to appropriately and sensitively frame that experience.



4.

Broader Reflections

WHAT VR MEANS FOR JOURNALISM

As a new technical medium for storytelling, VR calls for a new culture of storytelling that reflects its strengths. In this report, we've sought to surface insights and identify factors that can be helpful to the development of that culture. Given VR's potential to expand perspective and strengthen the emotional connection audiences have to a story, that storytelling culture is critical to quality journalism and its mandate to spread knowledge that improves people's lives.

Central to this new culture is a shift from storytelling to *storyliving*, which gives audiences a sense of *dual unity* that enables embodiment and participation, the expansion of perspective, and increased emotional attachment to a story. The potential impact on journalism is undeniable. VR can create a powerful emotional connection between audiences and subjects (both human and nonhuman). This connection often encourages viewers to seek more information and context about the issue in the aftermath of the experience.

But VR is not without its challenges. Journalists tell stories with specific objectives in mind, and communicating specific pieces of information in a medium where they are forced to cede a significant degree of authorial control will continue to pose a dilemma. The ways in which the medium engages audiences with dramatic imagery and conveys a sense of presence could produce emotional oversaturation or, worse, sensationalistic spectacle. The sense of authenticity leaves audiences vulnerable to traumatizing content or manipulation.

The potential, though, to produce powerful journalistic content is undeniable. It is now up to early adopters, technology companies and creators — including journalists — to develop a culture around storytelling in VR that empowers journalists to do what they do best.

About the Researcher

Thomas Maschio is an anthropologist who has done extensive research on the religious and ceremonial life and the expressive culture of a Melanesian people of Papua New Guinea. He has also studied the rituals, routines and beliefs that make up Western and international consumer culture. The range of subject matter in which he has worked as a business anthropologist runs the gamut and includes: the virtual reality space, mobile phones and the digital space; journalism and the culture of the newsroom; storytelling and the new American experience of television; - for a change of pace, the relationship between owners and pets; the American philosophy of money and many other subjects and categories.

His academic career includes positions as Adjunct Assistant Professor of Anthropology at New York University, Instructor at The American Museum of Natural History, a Fulbright Scholar to Papua New Guinea and as a Postdoctoral Fellow at the East-West Center in Honolulu, Hawaii. Tom is the author of numerous academic and business articles and of the book *To Remember the Faces of the Dead*, published by the University of Wisconsin Press in 1994. He received his BA from Columbia College, his MA from New York University and his PhD in 1989 from McMaster University. Tom's anthropological business consultancy is based in Brooklyn, New York.

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