

Narrative Perspectives and Embodiment in Cinematic Virtual Reality

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Abstract. Along with the technological advancements of virtual reality over the years, has come the emergence of Cinematic Virtual Reality (CVR), where immersive 360-degree video approaches the high-quality found in feature film. Extensive research has been done on embodiment and presence in relation to Virtual Reality (VR), however, there is a lack of existing literature on the narrative effects of embodiment and perspective in narrative VR films. Exploring the concept of viewer embodiment and its connection to the cinematic concept of narrative perspective, we conduct a review of literature in relation to CVR and flat screen cinema, selecting five CVR films to conduct an analysis of how cinematic techniques for establishing perspective and embodiment can be translated from flat screen cinema. Considering embodiment and perspective in CVR, we propose a spectrum of embodiment between extreme distancing from and extreme identification with characters in the narrative. Areas for future exploration are considered in light of the lack of research in this area.

Keywords: Virtual Reality · Cinematic Virtual Reality · Filmmaking · VR · XR · Immersive Storytelling

1 Introduction

Embodiment and viewer perspective has long been a matter of interest in Virtual Reality (VR) research. Murray [19, 20], Lanier [14] and De La Peña [4] have commented on the importance of the viewer's role in VR stories, whether told using 3D Computer Graphic Imagery or 360-degree video. Chris Milk, a key proponent of the persuasive properties of VR, claims that the viewer's apparent presence within the scene is key to its power [17]. Much recent literature around VR storytelling emphasizes aspects of presence and immersion, arguably the key qualities that distinguish VR from forms of media presented on flat screens. Although considerations of embodiment in VR are not new, much research takes a purely functional approach, focusing on basic properties such as the effect of the viewer's apparent height [7, 16, 24] and ways to overcome 'simsickness' [28]. There is little existing literature on the narrative effect of embodiment and perspective in VR and - as VR storytelling is still relatively novel [5] - VR storytellers are not yet able to draw on an established narrative language of viewer embodiment.

In conventional filmmaking, by contrast, directors and cinematographers can draw on over 100 years of well-developed conventions and techniques regarding not only what the viewer sees in a scene but how they are apparently seeing it [35] and what this means for the story. Film audiences are able to make sophisticated distinctions between a disembodied view (e.g., from a camera looking over an actor's shoulder) to an embodied one (e.g., through the eyes of a character reading a letter).

2 Methodology

To explore perspective and embodiment in CVR, we first conducted a review of literature on embodiment and perspective in relation to CVR and to flat cinema. For flat screen cinema this is relatively straightforward due to the film and television industry's use of standardised directorial grammars and common terminology. Educators, practitioners and researchers are able to draw on texts such as Katz [12], Murch [18], etc. to describe filmmaking approaches. Until recently, this was not the case in CVR [16]. However, as VR gains popularity and dedicated VR production companies spring up, practical accounts of and guides to directing CVR are beginning to emerge. This has arguably led to a shift in emphasis in recent literature from theoretical speculation on how CVR might work to practice-based accounts from filmmakers [35].

Next, we selected a number of CVR films and conducted a shot-by-shot analysis of camera movement, placement and action in each. We explored how their creators use perspective and embodiment, considering these with reference to established techniques from flat screen cinema. Selecting CVR films for analysis was challenging as, due to the novelty of the medium, a universally agreed 'canon' of key works is yet to emerge. While certain films are better known than others, the exhaustive critical attention devoted to cinema means that the films analysed in the case study section of this paper were, therefore, selected both to represent a range of directorial approaches and commercial contexts and because they had received substantial critical attention or were high-profile pieces released by well-known directors or studios.

In attempting to compare approaches to embodiment in CVR and conventional cinema, several important factors should be considered. Firstly, the sophistication of devices used in flat screen cinema is due at least in part to the cultural dominance and longevity of the medium [12]. Viewers' ability to glean subtle narrative information from directing, cinematography and sound is often based on a life-time's exposure to film and television. CVR is a relatively new medium, and it may take time for viewers to become sufficiently familiar with the medium to engage with CVR films in the way they do with flat screen films. The comparative length of feature films compared to most VR films may also be a confounding factor. To date there have been very few feature-length VR films, possibly due to the novelty of the medium but also partly due to concerns about the health implications of lengthy exposure to VR.

Most importantly, the commercial and industrial contexts in which most VR films have been produced so far are arguably different from cinema. Film directors - especially directors of genre films - are able to target specific audiences with well-established expectations in terms of narrative, production value and style. CVR, by contrast, as an emerging medium, has yet to develop the production and distribution infrastructures that directors and producers of conventional cinema are able to access [16]. Several wellestablished film directors (most notably Doug Liman [40], Robert Rodriguez [41] and Justin Lin [42] have experimented with the medium and a number of individuals, such as Chris Milk, Nonny De La Peña and Felix and Paul, have risen to prominence as CVR filmmakers but there is yet to emerge a conventional framework for financing, producing and distributing high-quality VR films. Many of the most technically complex and widely watched VR projects have instead been produced as ancillary material to conventional cinema productions, especially Hollywood properties such as the Jurassic World and Marvel franchises. This has an effect not only on production context but also narrative intent: VR films are not necessarily attempting to tell the same sorts of stories in the same ways.

3 Definitions of Embodiment

Embodiment supposes one of the biggest challenges for storytelling in VR. While the use of first-person perspective in flat screen cinema is not rare and has been approached in different ways - the camera embodying a character/protagonist (*Lady in the Lake* [64], *Rope* [70]), a monster or creature (*E.T.*, [57], *Jaws* [61]), an object (*Cloverfield* [55], *Pulp Fiction* [67]), or a participative presenter in documentary-style narratives. CVR's narrative perspective is based on the trinomial user-camera-subject/object, an integrated unit we identify as a defining feature of the medium: In CVR, the user embodies the camera, which is in itself materialized in the immersive environment as a channel for the user. As it will be seen later, the user can be present in the virtual world through different levels of embodiment, depending on the specific conditions of each narrative, defining the third aspect of this trinomial: what is the user-camera embodying in the virtual world.

While embodiment can be associated with the notion of *having* a body, it also comprises cultural definitions regarding *experiencing* a body. From an anthropological perspective, embodiment is "how culture 'gets under the skin,' or the relationship of how sociocultural dynamics become translated into biological realities in the body." [1] An ontological vision suggests that "the idea that embodiment is key for the construction of our inner self representation by demonstrating that the sense of embodiment is also closely related to the sense of self." [15] And a phenomenological view sees it as "an existential condition in which the body is the subjective source or inter-subjective ground of experience" and "can be understood from the standpoint of bodily being-in-the-world." [3] These notions of embodiment allow a more critical yet creative approach to VR and HCI research, where "[b]oth presence and embodiment have a phenomenological sense, which can refer to the things we consciously notice about the role of our bodies in shaping our self-perception and identities through conscious introspection and deliberate reflection on our experience." [31].

There are several experiments conducted on how virtual reality affects the perception of our own body versus the one of a virtual body - famously, extensions of the 'rubber hand illusion' into virtual reality [10] - however, the creative characteristics of the embodiment trinomial seem to respond to a further extent to the relation with the rest of the virtual environment, more specifically through interactions organized in terms of creation, manipulation and communication of meaning. Dourish states that "the technologies of embodied action participate in the world they represent" [6] while Slater, Spanlang and Corominas argue that "there is evidence to suggest that a virtual body in the context of a head-mounted display based virtual reality is a critical contributor to the sense of being in the virtual location" [29] pushing further the conception of the HMD as an access to virtual worlds, facilitating the embodying trinomial user-camera-subject/object. However, we acknowledge that embodiment in virtual worlds is problematic, as it has repeatedly been argued by Murray [20, 21] and by Slater in numerous studies on the neurological effects of virtual reality. Both authors - and their collaborators - argue that, despite the instinctive reactions users have to virtual environments - as in 'rubber hand illusions' - they never really lose awareness of the real world, positioning users in a sort of divided consciousness of both environments.

This awareness is productive for narrative purposes, since it allows users to trigger an enhanced suspension-of-disbelief that allows them to voluntarily navigate virtual environments. While embodiment can be associated with having a body, awareness of a virtual body supposes a Sense of Embodiment (SoE), an "ensemble of sensations that arise in conjunction with being inside, having, and controlling a body especially in relation to virtual reality applications." [13] The SoE would consist of three subcomponents: sense of self-location, sense of agency, and sense of body ownership, and understands the virtual body as a "container, which can be any object in the context of virtual reality." [13].

The definition of SoE summarises the functions of embodiment for narrative purposes: The user ceases to be a passive, leaned-back spectator because of their own awareness. Moreover, the three components of the SoE, in addition to the participatory, co-creative and interactive nature of VR, grants the user with the ownership of a point of view. The challenge, then, is to converge the qualities of the trinomial with the conventions of narrative perspectives that have been the standard for filmmakers and narrators in almost every storytelling discipline. Like other immersive and participatory media, VR supposes a challenge to these conventions, inviting practitioners to innovate and subvert the traditional role of both creator and spectator.

4 Embodiment in Cinema

While viewers of CVR are surrounded by the action (at least in audio-visual terms) this is not to say that viewers of 2D cinema are not immersed in the films they watch. Depending on the genre, the type of action and the way it is presented through camera position, angle, framing and composition and editing, the viewer can be made to feel more or less involved. This sense of embodiment is contingent on empathy and the suspension of disbelief and can produce remarkably powerful effects [30]. Film viewers jump when the monster pounces, wince when the protagonist experiences pain, laugh along with comedic characters. Emotions, such as fear, anger, sadness, and joy can all be stimulated, as well as psychophysiological responses to situations, such as dizziness in high places, disgust at horrifying events. Gunning argues that in spectacular cinema, the viewer's involvement in the world of the film oscillates between unselfconscious immersion in the events of the story and detached appreciation of the craft skill involved

in the making of the film [8]. Embodiment in cinema is inextricably entangled with the cinematic concept of perspective. Perspective "determines who the viewer identifies with" [12] and can be modulated through a number of different devices and techniques. Crucially, perspective establishes the viewer's relationship to the narrative and how this should be manifested, including whether and how they should be embodied in the world of the film.

Katz categorizes perspective into three broad types: First-person, where we see the world through the eyes of the character – from a subjective perspective; Third-person Restricted, where the action is observed by the viewer as an ideal witness; and Omniscient, where the viewer has a holistic comprehension of the dramatic actions. Other theorists and filmmakers including Proferes [26] and Vera-Meiggs [32, 33] have refined these categories, to describe more nuanced relationships between viewer and film.

- Omniscient: As defined by Katz, most common in epic sagas, such as Lawrence of Arabia [65], The Lord of the Rings trilogy [66], or Schindler's List [72]. An omniscient perspective may allow the viewer access to multiple characters' perspectives but also may include perspectives available to none of the characters, for example, the aerial shots of battles in The Lord of the Rings, the shots of the insides of racing car engines in The Fast and The Furious [58];
- Third-person Distanced: A privileged viewer, at the same level as the characters, that witnesses the action from a dispassionate perspective, more involved with the actions than with the emotional development of the characters, most common in detective stories, adventure films, or whodunnits, like *Knives Out* [63], or heists like *Ocean's Eleven* [68].
- Third-person Participative: Also a privileged, character-levelled viewer, who has a closer emotional engagement with the main characters, most common in coming-of-age stories, dramas, melodramas, or noir films, like in *The Shawshank Redemption* [73], *Sound of Metal* [74], or *Stand by me* [75].
- First-person Indirect: The viewer witnesses the dramatic action sharing the character's subjectivity, seeing the world coloured by their gaze, but not directly from their eyes. This is common in films or sequences where events are not presented as objective or factual, but rather as subjective interpretations of such events, like in Fellini's 8 ½ [52], All that Jazz [53], Fear and Loathing in Las Vegas [59], or Rashomon [69].
- First-person Direct: The viewer sees the world from the character's eyes, being possible or not to share their subjectivity. For Vera-Meiggs, this is more a technical category, that is rarely but purposely used in films. This can be seen in the opening sequence of 8 ½, The Blair Witch Project [54], or Russian Ark [71].

As it will be observed, this typology is susceptible to be adapted into CVR, although the process is not without problems. On the other hand, we believe that merging narrative perspectives with different styles of embodiment can result in storytelling conventions for cinematic virtual reality.

4.1 Perspective Devices

In cinema, besides determining what the viewer sees, directors also establish perspective through the way we see, through well-established cinematographic and directorial grammars. Framing and Composition are key elements here and are deployed in combination with particular types of action, especially in relation to characters. The clearest example of this, the Point-of-View shot, mimics the character's view of the world by apparently placing the camera at their physical position and focusing it on their centre of attention [12]. The characteristics of other shot types also reinforce particular relationships to the action. The aerial shot - presented from a viewpoint not usually accessible to human beings - is usually read as a distancing device, presenting a dispassionate 'god's eye view' of the action [2].

Perspectival devices are deployed to determine both the viewer and the characters' relationships to the story and to each other. However, perspective is also used to expose power relationships within the narrative. By giving more or less screen time to characters (by including them in more or less, longer or shorter shots) the viewer can establish their importance to the story [12]. The power of characters in relation to each other can be manifested through higher or lower camera angles or through tighter or looser framing. Similarly, the viewers' visceral involvement in the action can be increased or decreased by measures such as faster or slower editing, lower or higher camera angles (especially in the case of action sequences such as fight scenes and car chases) and closer or wider framing [12].

It should be noted that films which are presented from a single uninterrupted perspective are relatively rare. Even 'one take' films such as *1917* [51] use a moving camera to provide shifts in perspective and viewer involvement throughout the film. Very few film (exceptions include *Lady in the Lake* [64], *Enter the Void* [56] and *Hardcore Henry* [60]) maintain a single consistent perspective on the action but many more films vary perspective from scene to scene and in some cases from shot to shot. For example, The *Blair Witch Project* [54] uses a consistent first-person direct perspective but from multiple characters' perspectives. *Jaws* [61] combines various 3rd person participative and first-person indirect perspectives on the actions of the human characters while presenting the killer shark's view of the world through a first-person direct perspective. *Cloverfield* [55] uses the 'found footage' format to present the action from a first-person perspective via a handheld camcorder, apparently used by the characters. However, this is disrupted at several points when the camcorder is left unattended presenting a 3rd person view of the action.

5 Embodiment in Cinematic Virtual Reality

Many of the devices described above rely on the use of the frame, constraining the viewer's gaze to characters and parts of the scene important to the story. The lack of a conventional frame in VR presents novel challenges to storytellers, not limited to cine-matography, but extending to concerns such as blocking (the placement and movement of characters in a film scene), acting, and editing. At the centre of many of these challenges is the effect of physical viewpoint on the narrative. For audiences from societies dominated

by conventional approaches to flat screen films, filmmakers must choose between adapting well-known and widely understood conventions for establishing embodiment and perspective from cinema or develop entirely new techniques that leverage the properties of VR.

Although CVR filmmaking is relatively new, theorists and practitioners have identified a number of key concepts in order to describe the properties of this medium for filmmakers. Williams, Love and Love [34] introduce the concept of 'gravity', conceptualising the camera as being at the centre of a cinematic universe around which the story revolves, both figuratively and literally. They suggest a useful distinction between 'Newtonian' approaches, where the action is predominantly arranged in front of the viewer, requiring little or no movement of the viewer's head or body, and 'Copernican' approaches, where the action requires the viewer to turn to view the action, which might be taking place behind them.

Importantly, William, Love & Love also specifically discuss a key problem of embodiment in CVR stories: the persona gap. This is characterised as narrative uncertainty in situations where a viewer knows they are seeing a story from a characters' physical point of view but have little or no information about the character. This is directly related to how the trinomial user-camera-subject/object is drawn within the narrative, and how it is embodied in the virtual world, whether its presence is material or not. To approach this, they have adapted traditional narrative points of view into CVR guidelines, identifying four possible observers. [34].

God: "neutral, all seeing, that the characters don't see," [34] with many similarities to the omniscient perspective that is invisible to the characters in the virtual world - hence, although not explicitly mentioned by the authors, a disembodied observer.

Griffin: "is an actual character who occupies space in the scene" and is acknowledged by other characters. However, it doesn't have a virtual body that the user can see or use. They also identify two types of Griffin: "a first person POV where the entire story revolves around the audience's perspective" [34] that is at the centre of the action; and a second person perspective that watches the action from the side.

Bod: "also a character - this time with a body" the user can recognize. This user gets to embody someone else (a character with their own body, clothing, race, sex, etc.) rather than being present as themselves. As with the Griffin, the Bod also can be identified as a first or a second person, although the authors make further distinctions: A passive Bod where the body doesn't do anything, and an active Bod, where the body moves but at its own accord, without responding to the user's agency.

Dog: a non-human perspective, where the user-camera is placed or embodied in an animal, object, monster, or any other non-human element.

Similarly, Nicolae [23] proposes three spectator perspectives in VR films, calling these spectatorship modes; 'the witness' (a viewer onto the action), 'the hero' (viewer is at the centre of the story, but retains their identity), and 'the impersonator' (viewer becomes an embodied character in the story).

These categories can be very useful to approach narrative perspectives in VR, but they are not exempt from complications, particularly regarding embodiment and how this can influence feelings of presence, engagement, and perspective-taking. The use of these POVs would depend on the narrative objectives of each film and would need to be observed case by case in order to assess potential problems or successes. These POVs provide a guide to identify different types of narrators in VR films and observe the characteristics that define the relation between such narrators and the embodied user. In other words, we are observing the narrative configuration between narrator and embodiment in CVR, to try to define potential narrative conventions.

6 Case Studies: Embodiment in Practice

6.1 Jurassic World: Blue: Spectacular Cinema in the Round

Jurassic World: Blue [43] was produced and directed by Félix Lajeunesse and Paul Raphaël as VR studio Felix and Paul in conjunction with Oculus Studios to coincide with the release of *Jurassic World: Fallen Kingdom* [62]. The VR experience was distributed exclusively through the Oculus store. The 7 min film combines live action footage and CGI elements created by Industrial Light and Magic and features as its protagonist, Blue the velociraptor; a well-known character from the film franchise.

The film consists of two separate sequences, each apparently consisting of a single take, separated by a transition to black. The camera moves smoothly forward in an extended dolly shot over the course of each sequence and all the key events in the story take place in front of the viewer. As the camera's position changes little during the film, changes of narrative perspective are achieved largely through character action and a number of directorial techniques from traditional cinema are used. As there is no dialogue and the scenes are almost static, the simple plot (a dinosaur hunts and encounters predators in the island environment in which the films are set) plays out entirely through character action. The viewer has no visible presence in the scene and there are no devices used to explain how and why they are there: the camera generally provides a third-person distanced perspective on the story. However, several devices are used to move from a view of the scene that prioritises understanding of narrative through characters' actions, to a more visceral, first-person experience of 'being in the scene'.

Much of the film is presented from a camera position which combines characteristics of a conventional Over-The-Shoulder shot and a Point of View shot, following the dinosaur from the left and slightly to the rear, leaving the centre of the field of view open (see Fig. 1). In 2D cinema, these two shots are used for slightly different purposes. While OTS shots provide a view of the character and what they are seeing, reinforcing their physical and narrative connection with the scene [12], POV shots are generally used to prioritise what they are experiencing, by placing the viewer directly in the space they inhabit [12]. In Jurassic World: Blue, the combination seems designed to enable the viewer to experience a perilous environment in as visceral a way possible while also receiving narrative cues from the dinosaur's reactions as to how to read events in the scene. However, the perspective in Blue is not a 'true' POV shot, instead conforming more closely to the Griffin perspective described by Williams, Love and Love[34].

Character eyelines are used to alert the viewer to events taking place at the edge of the field of view. For example: Blue moves close to the viewer and cranes her neck upwards, to foreshadow the eruption of a volcano and looks directly across the viewer's



Fig. 1. Two different views from the same viewpoint in Jurassic World: Blue

field of view to the left when another dinosaur appears in the scene from that direction (see Fig. 2). Changing power relations between characters as Blue encounters larger and larger predatory dinosaurs are reinforced by the scale of each character in the scene in relation to the height of the viewer's point of view: the viewer has to look up to see these dinosaurs, providing a close equivalent to a low-angle shot in conventional cinema. The simple narrative and short form of the film requires only that the viewer understands the context of the character's actions, principally the relationships between the predatory protagonist, her prey and the larger dinosaurs who might prey upon her. The final sequence of the film, in which helicopters fly overhead, is not explained and is seen from the perspective of the dinosaurs as a frightening, mysterious event.



Fig. 2. Clear direction of gaze in Jurassic World:Blue

6.2 HELP: Camera Positioning and Perspective

HELP [42] was produced and directed by Justin Lin, established director of Star Trek Beyond and various Fast & Furious films, in conjunction with Google Spotlight Stories in 2016. Much like *Jurassic World: Blue, HELP* also combines live action footage and CGI aspects in CVR but uses movement to progress the sequential narrative through a constantly evolving scene. Justin Lin claims *HELP* is, "the first cinema quality narrative in the VR space" [9], using fast action sequences and a range of audio and visual cues within the story to direct the viewer's attention towards the action.

The five-minute film consists of a young woman scrambling to escape from an alien creature that chases her across downtown Los Angeles. At a climax point, the young lady realises the alien is only asking for help, and after receiving aid it peacefully ascends back into space. The film appears to consist of a single take, with a tracking dolly shot that follows the action and fast paced movement of the narrative. Throughout the story the camera position is constantly changing, at the beginning it is in a 'god's eye view' looking down on the scene from above, and then progresses into more of a traditional eye-level view of the scene that closely follows the main characters. The steady camera movement stops at various points in the film to allow the viewer to reorient themselves in the scene, and to accentuate emotional narrative moments. At the climax, the camera pauses at a low angle which makes the humans and objects in the scene appear rather imposing. The camera is positioned specifically at level with the alien at this point to create a more empathic link between the viewer and the creature through the perspective of the narrative (see Fig. 3).



Fig. 3. Low camera angle in HELP.

The events of the narrative take place across the entire 360-degree space, causing the viewer to actively look around for relevant story elements. In turn, this increases the reviewability of the film, as the viewer is moved quickly through the evolving scene whilst multiple story elements are taking place around them. The director tries to tackle this by placing the two main characters throughout the chase, the young lady and the alien, directly in front and behind of the viewer (see Fig. 4). Character eyelines and audio cues, such as loud crashes, are used to alert the viewer to specific story elements taking place within the 360-degree field of view. This relates to the Copernican approach as interpreted by William, Love and Love.



Fig. 4. Viewpoints of the action taking place directly behind and in front of the viewer in HELP

The viewer has no visible presence in the scene, moreover the camera provides more of a third-person perspective of the narrative. This corresponds to the 'witness' spectatorship mode in VR film, where the viewer observes the scene as it unfolds in front of them, and there is no active engagement with the viewer from the characters in the story [23], evolving from the 'third-person restricted' perspective in cinema [12].

At the end of the film the camera follows the movement of the alien's ascension towards the stars. It is not explained as to why the viewer is following the alien here, potentially this is seen as an empathic device that isn't possible in cinema but is using the novelty of VR to engage the viewer through the perspective of the narrative.

6.3 Clouds Over Sidra: Empathetic Perspectives in Documentary CVR

VR's capability to embody another person started being explored by fundraisers around 2015, after Chris Milk famously called VR the "ultimate empathy machine." [17] This premise is based on the principle that embodying another person living in a different context could enhance feelings of empathy through perspective-taking tasks, placing "users in novel environments, showing them what it would be like to experience a specific situation from someone else's perspective." [11] Since then, numerous international non-profits and humanitarian organisations started using VR to promote engagement and participation in humanitarian causes, triggering a trend of VR documentaries made for such purpose. The most recognized is *Clouds over Sidra* [37], commissioned by the United Nations, and setting a certain narrative standard for this type of documentary.

The film shows a refugee camp in Jordan and starts with the user being in a room with a girl, while listening to the voice-over of the same girl, who introduces herself as Sidra. The film then shows various slices of the life within the camp, narrated by Sidra's voice over, although she can be seen as part of the scene - going to school, in the playground, back at her house, etc. - or not at all - bakery, men's gym, general view of the camp, etc. The formal characteristics of the film are simple. The camera is positioned at an adult's eye-line and is treated as a passive witness of life in the refugee camp. While Sidra appears and reappears as the main character, she doesn't play the role of a guide, addressing the camera directly only at the beginning of the film (see Fig. 5). This first - and only - acknowledgement of the user seems to be granting them presence in the camp - despite the user/camera not having a body, restricted to looking around itself - a user with Copernican gravity. From then on, it is a witness on a human level and at a human distance of the events around them; it is never again addressed directly - although it could be argued that it is towards the end, when a group of children form a circle around the camera, or in the next scene, back to Sidra's room, where she is there but doesn't talk or look directly at the camera anymore.



Fig. 5. On the left, at minute 0:33, when still introducing the film, Sidra acknowledges the embodiment of the user-camera in the refugee camp. This sets the tone for the overall narration, even for scenes where Sidra can't be seen (in the middle, in a men's gym at 3:48). On the right, at 6:43, the user-camera returns to Sidra's room; although she is not looking at the camera, the intimacy of the moment reinforces the emotional engagement to the character.

Following categorizations of narrative perspectives in cinema, *Clouds over Sidra* mostly relies on a third-person participative perspective, where the second person Griffin (character without a body) is invited to emotionally engage with the world and the characters they see. This is enhanced by Sidra's extra-diegetic voice-over, that narrates each scene from a subjective point of view, sharing intimate details and her own opinions, rather than an intellectualised vision of life in the camp. As a dramatic device, the voice-over is used in other VR short films as a subjective voice, to signify that the user-camera is embodying a character - i.e. *The Party* [45]. However, in *Clouds over Sidra*, the intimate relationship established from the beginning is then extended throughout the film through the non-diegetic voice-over that complements the image with a subjective narrator that participates emotionally in the scene and the portrayed world.

The conventions set in *Clouds over Sidra* have been replicated in similar documentaries thereafter: *Evelyn's Story* [38], *I am Rohingya* [39], *Layla Comes Home* [44], *The Source* [46], *Ready to Learn, Ready to Live* [47], to name a few. These all rely on similar third-person participatory perspectives that operate as witnesses despite not having a body and are guided by an extra-diegetic voice-over of a character that operates as a subjective narrator, while also appearing in the film themselves. This third-person participative is such because it participates in the narration on an emotional level, despite not actively taking part of the action - for instance, in being addressed directly by the characters, considering the constraints of cinematic VR. This type of narrative strategy is consistent with the intentions behind the organisations that commission this type of film: fundraisers appealing to the empathetic feelings of potential donors and volunteers. Certainly, this doesn't set a unique standard for this type of documentary. For instance, *A Journey to the Arctic* [36], commissioned by Greenpeace, relies on a similar witnessing use of camera but uses a neutral, objective, distanced, non-diegetic narrator as a voice-over that doesn't belong to any character, facilitating a more intellectual observation. There are other similar, more intellectual approaches to documentary narratives in VR. Nevertheless, this pool of films is starting to set certain conventions in cinematic VR that aims to generate emotional empathy towards characters and the worlds they inhabit.

6.4 Distanced Witnesses in Rebuilding Notre Dame

A different approach to documentary narratives in VR can be found in the work by Targo Stories, a virtual reality media company that has gained recognition in recent years. Their film *Rebuilding Notre Dame* [48] collects testimonies of relevant personalities around the reconstruction of the cathedral after the fire of 2019. The documentary opens with a collage of television news screens reporting the disaster in different languages, to then transition into an aerial shot flying above the cathedral. This shot immediately sets a difference with the third-person participative that is dominant in *Clouds over Sidra*, placing the user-camera in a non-human, god-like perspective. This omniscient view is not constant in the film but sets the more analytical relation between the camera and the topic, in comparison to the emotionality of the third-person participative.

The camera in *Rebuilding Notre Dame* is mostly placed on a human level - except for the aerial shots - and is presented as a Griffin (see Fig. 6), but the POV feels closer to the third-person distanced perspective for two reasons. First, the relationship established with the narrator. While in *Clouds over Sidra* the narrative is built on the emotional relation with the main character through their subjective view of the world, *Rebuilding Notre Dame* doesn't have a main character. It still relies on voice-overs: The first voice that is heard is anonymous, while the camera is still observing the cathedral from different angles (human and non-human), is then revealed to belong to Patrick Chauvet, rectorarchpriest of Notre Dame, sitting in a studio looking directly at the camera, addressing the viewer. While the exercise is similar to *Clouds over Sidra*, this is not constant. A similar strategy is used throughout the film many times to reveal different characters, who share their testimonies presented in a rather formal fashion, similar to interviews, and without establishing an emotional link with the viewer. The film doesn't count with a main narrator, resulting in a collage of voices subordinated to the impressive images of the cathedral before and after the fire.

The second reason is related to the editing. In *Clouds over Sidra* the editing is subverted to the narration of the main character, which complements the images with her subjective view. The camera and the narration complement each other to give spatial consistency to the refugee camp, and even when some might feel sudden, the next shot still responds to the idea of the space that is being narrated. *Rebuilding Notre Dame*'s erratic relation to the space makes the gravitational pull less evident; there is an intermittency between general shots that invite the user to wander the gaze around the cathedral in a rather Copernican way, and abrupt cuts that redirect the sight towards an interviewee that directly addresses the camera, shifting into a Newton gravity. *Rebuilding*



Fig. 6. The alternating placements of the camera in Rebuilding Notre Dame, and the editing techniques used to jump from one perspective to another, facilitate a more distant observation of the events, the cathedral, and the testimonies. On the top left, the image shows an aerial omniscient perspective of the cathedral, which contrasts with the first-person point of view being addressed by a character in the top right image. The images in the middle illustrate the drastic cuts from one part of the cathedral to another, while the bottom images illustrate a jump cut, an editing technique commonly used for disruptions in the narrative.

Notre Dame uses more evident cuts, jumping between different areas inside the cathedral that are not always visually connected to the previous shot - different wings, different floors, inside the belltower, next to the stained-glass windows, etc. - and outside - from the street, external corridors, the roof, etc. - which causes a notorious disruption in the user-camera's spatial localization. Moreover, the use of jump-cuts within the church makes the artificiality of the editing more evident. Like in cinema, this technique generates a distance between the spectator and the object/subject of the film, facilitating a more analytical perspective on either this or on the film itself.

Rebuilding Notre Dame is an interesting case because it seems to set certain conventions towards the Targo's following documentaries. The series *When We Stayed Home* [49] and the film *Surviving 9/11* [50] seem to correct the intermittent narrator and rely on one voice that serves as the thread that unifies each film. Similarly, the style of editing is softer and avoids abrupt jumps from one space to another completely different. However, it is still open to interpretation how intimate and emotional the narrative is from a cinematic view. The narrator is still presented under the formalities of an observational documentary [22], which places the user-camera to a certain distance and in an artificial studio environment. Likewise, the editing in these films encourages the viewer not to look around him, locating all relevant objects in the same place in relation to the camera/viewer. These two characteristics give the documentaries a more televisual quality, making the narration generally more analytical than emotional.

6.5 Specific Embodiment in The Party

The Party [45] is a CVR production commissioned by The Guardian and directed by Annick Bregman and Shehani Fernando. The piece attempts to convey as directly as possible the experiences of a young autistic girl at a family party, illustrating the challenges she faces. The piece is presented entirely from the girl's point of view, via a single fixed camera position. This is reinforced using voiceover to convey her thoughts and to introduce the story. Postproduction effects such as blurring of faces and sound distortion are used to illustrate the effect of her condition on her experience of events (see Fig. 7). These include an artificial Depth of Field effect in which the viewer's attention is forced to a single point and the rest of the scene becomes blurred. This has the effect of making the viewer conscious of varying agency in the scene: at some points they can look around freely while at others, they are unable to focus on anything but a single point, again illustrating the protagonist's condition.



Fig. 7. Blurred faces used to simulate an autistic girl's experience of a party in The Party

Other characters move around the scene, talking directly to the viewer and she converses with them, with spatial sound used to distinguish between internal monologue and interpersonal dialogue. Unlike the other works described in this paper, *The Party* uses a 'Bod' approach [34]: the viewer has an implied body. Looking down, the viewer can see a coloured blur, occupying the space the girl's body would inhabit in the scene.

Although most events in *The Party* take place within the 180-degree area in front of the viewer, the action of characters is complex, with multiple conversations and character actions taking place at the same time. The action moves around the scene, requiring the viewer to turn to pay close attention. At several points, as in *Help*, the viewer's attention

is split between several actions taking place within the same 'frame'. In the story, this is accompanied with a voiceover from the protagonist explaining that this confusion reflects her own state of mind.

7 Discussion

The films analysed above demonstrate a range of approaches to perspective and embodiment in CVR, correlating in each case to the specifics of each narrative. A well-known challenge to conventional filmmakers approaching CVR is the lack of a frame in which to compose conventional shots which would traditionally be used to construct meaning over a series of cuts. However, as seen in *Jurassic World: Blue*, and *HELP*, the immersive space of CVR is instead able to support multiple choices of 'shot' (e.g., OTS and POV) within a single take, with the viewer able to move smoothly from one to another through movements of the head, in a process roughly analogous to cutting. Furthermore, in *HELP* the viewer can select which part of the story they would like to engage with through this head movement, as the fast-paced narrative takes places across the entire 360-degree space. This gives the viewer a range of freedom that is specific to the medium itself.

Crucially, in *Jurassic World: Blue*, these choices are available within the viewer's immediate field of view: a situation different both to the sequential presentation of a film edit, or the selection of different narrative branches in an interactive film. In certain cases (such as moments when the viewpoint is directly alongside the protagonist dinosaur), the resulting effect is a combining of perspectives: both an OTS shot containing third-person narrative information about the dinosaur's reactions to the scene and a first-person POV shot, placing the viewer so close to the dinosaur's physical position that their points of view are almost coterminous.

The narrative proximity generated in *Jurassic World: Blue* is not strange to cinematic techniques that generate identification with characters - human and non-human through the use of the camera, among other techniques. In *Clouds over Sidra* and other documentaries of its kind, this emotional proximity is generated through a combination of techniques, primarily the introduction of the main character as someone approachable and on the same level as the user, enhancing the sense of presence in the refugee camp. Thereafter, while Sidra herself is not present in every shot, the use of a subjective voice-over and an editing style that provides continuity to the user's presence in the camp, while connecting each location to the narration, enables a constant closeness to the character, who in this case also plays the role of the narrator.

In *The Party*, this identification with a single character is taken to extremes. A highlevel of specific embodiment is achieved through the use of a fixed viewpoint, voiceover as internal monologue and the inclusion of an implied body, similar to the 'bod' observer. Rather than drawing the viewer's attention to a clear area of interest as in conventional cinema, confusing configurations of character action are used to reinforce the film's key narrative message: that the protagonist finds social situations difficult to make sense of.

In *Rebuilding Notre-Dame*, on the other hand, the formal cinematic techniques maintain the camera-user in a considerably more artificial position, compared to the organic nature of the embodiment in *Clouds over Sidra*. Here, the use of disjunctive editing, jump-cuts, non-sequential spaces, and aerial shots are a constant reminder of the artificiality of the observer. This is also reinforced by the inconstant narrators, or the absence of a sort of host - like Sidra or Blue - that provide the story with conducting thread, also keeping the user from establishing an emotional relation with any character and, instead, facilitating a more intellectual approach.

In considering embodiment and perspective in VR, it is possible to conceive of a spectrum of embodiment, between extreme distancing from and extreme identification with and embodiment of characters. In terms of narrative meaning, we argue that the distanced end of this spectrum is roughly equivalent to techniques in cinema. An aerial shot giving a 3rd person view of a scene in which action is taking place, has roughly the same affordances in VR as in flat screen cinema. However, at the end of extreme embodiment, CVR techniques have the capacity to more closely identify the viewer's perspective with that of a character (through a sense of presence in the scene, demonstrated through the inclusion of a body, viewer's agency in terms of directions of gaze etc.) than techniques from flat-screen cinema. Figure 8 shows this in graphical form, with the case studies discussed included at various points.



Fig. 8. Types of Embodiment in the Case Studies Discussed Above.

In CVR, power relations would involve a more direct consideration of the user, placing within the space where power tensions take place, becoming part of the miseen-scéne with more or less prevalence depending on creative objectives. [25] The ability of VR to facilitate feelings of presence in a virtual environment can also be seen as a break of the fourth wall that separates the narrative from the spectator, generating the conditions for an emancipation [27] in which the user comes to integrate the creative experience.

8 Conclusions

While the POVs proposed by Nicolae and Williams, Love & Love are helpful in terms of how to treat the camera, these are still not problematized enough to address the extension of embodiment as a narrative experience rather than just as having a body. Moreover, we believe that exploring embodiment as a narrative category can expand on the understanding of VR's own and unique storytelling conventions.

We believe the spectrum of embodiment proposed is also tied to the notion of the trinomial user-camera-subject/object: If embodiment is a defining and unavoidable feature of CVR and it directly affects the way stories are narrated, then generating and/or identifying conventions for the different ways the user is embodied in the virtual world can potentially contribute to improving blocking and narrative techniques that are unique for CVR. Through CVR, certain modes of address change meaning, and effects can become exaggerated. For example, the direct to camera becomes very confrontational or didactic, depending on the type of relation that is meant to be generated with the character and/or environment. Meanwhile, the lack of a frame in which to compose conventional shots can allow for combined perspectives, such as the OTS and POV shot in Blue.

Narratively speaking, different techniques affect the sense of presence and, thus, the narrative perspective through which the user integrates into the story. In Blue, HELP, The Party and Clouds over Sidra, a more continuous editing enhances the sense of narrative presence, while in Rebuilding Notre Dame, the discontinuous editing facilitates a more intellectual or distanced approach. We are referring to a sense of narrative presence that considers qualities that are specific to the narrative objectives of a certain piece, and/or how the user is integrated to the story: subjectively, like in The Party; emotionally, like in Help, Blue or Clouds over Sidra; or intellectually, like in Rebuilding Notre Dame.

Further exploration of these potential grammars should facilitate the identification and design of narrative conventions for VR that consider the problem of embodiment through creative solutions. We have been able to observe how editing, camera, and sound techniques affect the sense of embodiment and the sense of presence from a narrative point of view. Future work should be able to assess these effects in a larger audience, to observe how different cinematic techniques can affect the storytelling possibilities of VR.

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