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ARTICLES

Virtual Reality, Literature and Education: Immersive Narratives for Children and Young Adults / *Realidade virtual, literatura e educação: narrativas imersivas para crianças e jovens*

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ABSTRACT
In this article, we discuss the potential of Virtual Reality (VR) technologies for the creation and adaptation of stories aimed at children and young adult, focusing on the specificities of their usage protocols. We begin by introducing narratives in VR and their connection to the field of children and young adult literature. Subsequently, 360º videos targeted at children and young people are presented, along with the reading and engagement protocols that arise from their peculiarities. Starting from the field of Cinematic Virtual Reality (CVR), we discuss about the main challenges posed by this medium for the enjoyment of immersive works, based on the analysis of the work *Invasion!*, produced by the Baobab studio. Thus, we conclude that both the production and reception of narratives in Virtual Reality presuppose the management of the viewer's vision and attentional focus, considering the reading protocols already learned and naturalized through other media.
KEYWORDS: Literature for Children and Young Adults; Cinematic Virtual Reality; Diegetic Cues; Digital Narrative; Immersive Environments

RESUMO
Neste artigo, trazemos uma reflexão sobre o potencial das tecnologias de Realidade Virtual (RV) para a criação e a adaptação de histórias destinadas ao público infantil e adolescente, focando nas particularidades de seus protocolos de uso. Iniciamos apresentando as narrativas em RV e sua relação com o campo da literatura infantojuvenil. Logo, são apresentados os vídeos em 360º endereçados a crianças e jovens, bem como os protocolos de leitura e engajamento que emergem de suas particularidades. Partindo do campo da Realidade Virtual Cinematográfica (RVC), discutimos os principais desafios impostos por essa mídia para a fruição de obras imersivas, baseados na análise da obra Invasion!*, produzida pelo estúdio Baobab. No contexto da obra analisada, concluímos que tanto a produção quanto a recepção de narrativas em RV pressupõem um gerenciamento da visão e do foco atencional dos observadores, considerando os protocolos de leitura já apreendidos e naturalizados através de outras mídias.*
PALAVRAS-CHAVE: Literatura infantojuvenil; Realidade virtual cinematográfica; Pistas diegéticas; Narrativa digital; Ambientes imersivos

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Introduction

The ability of good stories to draw us into their worlds is a powerful source of pleasure, regardless of the genre and medium in which they manifest. On the other hand, the specific forms and materialities of narratives establish their own reading and enjoyment protocols, which need to be learned, absorbed, and naturalized by the audiences for them to experience the pleasures associated with these protocols. In this context, considering that 360º environments hold great aesthetic potential to produce immersive narratives, we propose a discussion on the potential of Virtual Reality media for the production and adaptation of narratives addressed to children and young adults, with emphasis on the specificities of their usage protocols.

For Roger Chartier (2011), reading protocols refer to the signs or marks that authors and editors inscribe into printed works with the purpose of regulating the processes of meaning-making that readers engage[1] in during reading. Since the protocols instituted by digital works are not restricted to the reading of verbal text, also including other semiotic modes, we consider more appropriate to characterize the processes present in works of this nature as "usage protocols" or "navigation protocols."

Virtual Reality is an immersive form of media that places the user inside its world by means of certain interface devices, typically googles with stereoscopic features and manual controls. The experience of watching a film in VR is different from watching the same film on a flat screen. According to Nicolae (2018), in the case of traditional 2D and 3D films, spectators are positioned between the screen and the projector. This enables them to participate in collective viewing and even engage in certain social practices, such as having a quick conversation about the film with the viewer next to them. In the case of VR, however, the viewer's visual and auditory senses are isolated from the external world since they are fully immersed in the environment.

While VR narratives maintain certain protocols and modes of engagement already established by cinema and animation, they also introduce new usage protocols. These new

[1] Linda Hutcheon (2006) has explained that the modes of engagement relate to the different media and genres in which stories are created and transcoded. They engage their audiences in different ways: while certain types of narrative are based on 'telling' (for example, novels, stories, oral histories), others are based on 'showing' (like theater, for example) and, finally, some have an 'interactive' mode, where the user can physically and kinesthetically interact with the narrative elements, such as digital media.

protocols must be comprehended and embraced by potential users to enable meaningful experiences of enjoyment and interpretation. In other words, media education focused on VR needs to consider the specific usage protocols of this new media. Building on this assumption, here we address some of the main specificities imposed by VR media for the enjoyment of narratives aimed at children and young adults, with emphasis on issues of perspective and focus of attention.

The theoretical framework adopted for the analyses is based on the field of Virtual Reality for Cinema (VR Cinema), but the discussions also draw on research from the fields of narratology and digital media studies. In the first section, we present narratives in Virtual Reality and their relationship with the field of children's and young adult's literature. Since the majority of works currently available on VR content platforms are 360º videos, we address this genre in the second section, focusing on works aimed at children and young adults. In the third section, we discuss the main challenges posed by the reading protocols and modes of engagement of VR formats, most of which derive from the specificities of this format regarding the production of point of view and perspective. In the fourth section, we present the main studies in the field of Cinematic Virtual Reality aimed at creating alternatives and solutions to these challenges. Finally, in the fifth section, we analyze the work *Invasion!* by Baobab Studios, with the aim of examining how this piece of work presents solutions and alternatives to the challenges mentioned in section three.

1 Literary Narratives in Virtual Reality

Experiments with Virtual Reality in the literary and artistic fields have been conducted since at least the 1990s, when some North American universities invested in the creation of a system called the "Cave Automatic Virtual Environment." The CAVE, as this immersive chamber system became popularly known, was originally developed in 1992 at the Electronic Visualization Laboratory (EVL) of the University of Illinois, Chicago, and can be described, in simple terms, as a small room or chamber in which "high-resolution stereo graphics are projected onto three walls and the floor to create an immersive Virtual Reality experience" (Coover, 2004, p. 10).

One of the pioneering artists in this context was the American novelist Robert Coover, who is also one of the founders of the field of digital literature. Upon learning about the existence of the CAVE system at Brown University, where he worked, he began to conduct literary writing workshops for that environment, aiming to expand the projects of digital literature that had already been undertaken for reading on screens. In his words,

> The Cave Writing Workshop is an advanced experimental electronic writing workshop, moving off the screen to explore the artistic potential of text, sound, and narrative movement in immersive three-dimensional virtual reality—what might be thought of as adventurous experiments in spatial hypertext (Coover, 2004, p 11).

Despite Coover (2004) and other artists worldwide creating artistic and literary works in VR since the 1990s, the utilization of this technology remained highly restricted and exclusive until the 2010s, partly due to the complexity of the systems - as many of them relied on immersive chambers like the CAVE - and partly due to the extremely high cost of the equipment. From 2010 onwards, this scenario began to change due to the popularization of Virtual Reality systems composed of hand controllers equipped with various interface points and devices attached to the head - which have been referred to, among others, as "Visioheadsets (VHS)," "Head Mounted Displays (HMD)," "Virtual Reality headsets," and more recently, "Smart googles" and "Virtual Reality googles." Although they are not really cheap, these systems have been popularizing VR among an increasingly broad audience around the world in recent years.

With the popularization of these new systems, various niches of the creative industry[2] have become interested in producing narratives in VR, notably the niches of the electronic gaming industry, filmmaking, and literary and artistic experimentation. A significant number of works and artifacts produced by agents of the creative industry are specifically targeted at the children and adolescents. In their analysis of the narrative genres that predominate on Virtual Reality content platforms to date, Jay David Bolter, Maria Engberg, and Blair MacIntyre (2021, p. 135) observed the predominance of two main formats: 360-degree videos (also called virtual reality videos or virtual reality movies), characterized by the researchers as a less potent category of VR; and works of

[2] The concept of creative industry used here is based on Thompson (2021) and encompasses the system formed by publishers, startups, large media corporations and their consumer audiences.

True Virtual Reality computer graphics, composed of three-dimensional moving images in 360 degrees, supplemented with interactive features. Since the majority of narrative adaptations for children and young adults currently available are 360-degree videos, we proceed to present this format in the following section.

2 360º Videos

Regarding the semiotic specificity of 360° videos, Bolter, Engberg and MacIntyre concluded that

> As the painted panorama remediated the perspective painting and the photographic panorama remediated the photograph, so 360° videos are clearly remediations of film; 360° videos occupy an intermediate position between traditional 'flat' film viewed on a rectangular screen in a theater and true computer-graphic VR (Bolter; Engberg; Macintyre, 2021, p. 65).

Thus, while these videos repeat a series of techniques and narrative strategies from traditional cinema and animated films, they also employ a set of differentiated techniques aimed at creating an "enhanced sense of sensory immersion." In this context, the use of stereoscopy to produce the illusion of three-dimensionality stands out, on one hand, and the use of 360-degree or 180-degree perspective to create the feeling of presence for the viewer[3] within the representation itself, on the other hand.

A technique commonly used in these videos, borrowed from cinema and television, is the effort to eliminate any evidence of the camera's presence in the film, consequently also eliminating the image of the body attached to the point of view. This procedure allows the observer to identify with the camera's point of view and accept the illusion that their own body is present within the immersive environment. Another frequently used technique is directing the characters' gaze towards the camera, which can also be accompanied by dialogue, further reinforcing the effect of including the observer in the plot and, consequently, enhancing the immersive effect of the experience.

[3] We have chosen the term "viewer" in this article, rather than "spectator" or "user," as used by other authors in this field (Mateer, 2017; Nielsen *et al*., 2016; Nicolae, 2018). The choice of the term "viewer" aligns with Dooley's concept (2021, p. 8), which aims to recognize "(...) the restricted nature of the experience offered by CVR, as opposed to more interactive and open-ended experiences."

From the perspective of narrative genres, 360-degree videos are highly diverse, with prevailing genres on major platforms including horror shorts, action narratives, adventure, and science fiction, many of which are animated. Some of the most well-known repositories of 360-degree videos include Within,[4] Steam,[5] Meta,[6] Blend Media,[7] YouTube,[8] and Google Spotlight Stories,[9] but it's also possible to access various works for free or for a small fee on VR content platforms maintained by companies that sell VR goggles. Most horror shorts for Virtual Reality explore the clichés abundant in the horror film genre that are successful in cinema and TV series platforms, such as zombies, vampires, alien attacks, dolls and toys turning into monsters, and various other distressing situations involving the protagonist, although it is also possible to find works that manage to escape these clichés.

Some of the best projects have been selected and showcased at prestigious film festivals around the world, such as the Tribeca, Sundance, and Cannes festivals, the Amsterdam International Documentary Festival, the Venice Film Festival and even the Cinema Exhibition in São Paulo, Brazil. One of several examples that can be mentioned here is the animation *Namoo*[10] ("tree" in Korean), which in 2021 was selected to be presented at festivals including *Sundance*, *Tribeca*, *Siggraph* and *Hollyshort* festivals among others. Another example is the French animation *Biolum*,[11] which was selected for screenings at various international festivals and received several awards and distinctions, including the Best Audience Award at SXSW, the NewImages Award, the UNIFRANCE Award and Courant3D. The narrative blends elements of horror and science fiction genres by immersing the viewer in an aquatic world full of bioluminescent creatures that initially captivate with their beauty but gradually reveal themselves to be dangerous as the plot unfolds.

An example of an animated film in the science fiction genre is *The Great C*,[12] an adaptation based on the renowned cyberpunk author Philip K. Dick's short story.

[4] The application was discontinued in February 2023. Cf. https://with.in/
[5] Cf. https://store.steampowered.com/
[6] Cf. https://www.meta.com/experiences/
[7] Cf. https://blend.media/
[8] Cf. https://www.youtube.com/@360/
[9] Cf. https://www.youtube.com/c/spotlightstories
[10] Cf. https://www.baobabstudios.com/namoo
[11] Cf. https://store.steampowered.com/app/1183700/Biolum/
[12] Cf. https://www.meta.com/pt-pt/experiences/pcvr/1620367211417812/

Originally published in the 1950s, Dick's narrative presents a devastated world ruled by an extremely powerful Artificial Intelligence called "The Great C." The animation based on this story was selected for the official film showcase at the Venice Film Festival in 2018 and won the Positron Visionary award at the Cannes Film Festival in 2020. As an example of an action short film, we can mention the Dutch gangster-themed film titled *The Invisible Man*.[13] In the story, the invisible man from the title is the viewer themselves. Once inside the story, the observer finds themselves seated at a table with three characters portraying criminals, who are playing Russian roulette with a revolver. Towards the end of the plot, with an ironic emphasis on immersion, one of the gangsters takes the gun, points it at the observer, and fires.

3 New Formats, New Challenges

One of the main challenges posed by narratives in 360-degree video format, both for observers and designers, is related to the need to manage attention, ensuring that crucial elements for the experience are not overlooked. In flat-screen cinematography, attention is guided by the camera, and the director can employ different perspective techniques for this purpose, such as the approach and distancing of shots, for example. However, in the case of VR narratives, gaze is not entirely controlled by the camera, as the environment grants a relatively high degree of freedom for the observer to explore the 360-degree or 180-degree space, thus commanding their own focus of vision and attention during the experience. In other words, in an audiovisual production intended for consumption on flat screens, the film is viewed within a delimited rectangular area, whereas in VR productions, the possibility of exploring space is expanded and may occasionally lead to dispersion.

Some artistic and literary works created for VR environments turn this possibility of dispersion into a significant aesthetic feature for the experience. In these cases, 'getting lost,' to some extent, is part of the usage protocol envisioned by the work itself. For example, the VR artwork *Realness – Intimate Garden* (2019) by French artist Sandrine

[13] Cf. https://www.youtube.com/watch?v=I_FUpUi2LBk

Deumier,[14] does not present a linear and temporal sequence of events. The proposal is simply to explore the virtual environment, which is filled with intertwined organic and inorganic bodies and objects connected by cables. As can be observed in the work, as you progress in exploring the virtual space, the entanglement becomes increasingly complex, making it difficult to identify each individual figure.

On the other hand, most children's and young adult narratives known from the Western literary tradition do not presuppose free exploration of space as a reading and enjoyment strategy, but rather the recognition of the sequentiality of certain structural elements that form the plot. These elements have been studied in the field of narratology since at least the 1970s, focusing on the relationships that can be established between the sequences that make up the plot - the narrative structure itself - and their arrangements on the level of the story - the level of enunciation or discursive manifestation. In this context, one of the proposals that has become extremely popular was the scheme by Paul Larivaille (1974), later refined by Paul Larivaille and Gérard Genot (1984), according to which every narrative is composed of five structural elements on the level of the story: initial state, disruption, transformation, outcome, and final situation (Larivaille; Genot, 1984, p. 284). As clarified by Charnay (2019, p. 106), in Larivaille's original proposal (1974), the five sequences were conceived based on a temporal scheme that encompasses the "before" – corresponding to the initial state –, the "during" – which includes the three intermediate sequences –, and the "after" – corresponding to the final situation. Even though, on the level of the plot, these elements can be arranged in various orders, they need to be present.

A large portion of the narratives that make up the repertoire of children's and young adult literature in the Western tradition indeed adhere to this scheme, which should not come as a surprise, as the theoretical tradition underpinning French narratology traces back, among others, to the studies of the Russian Vladimir Propp, who had taken the fairy tale as a corpus of analysis to develop his theory that every narrative structure is formed by a set of constant functions or actions. Presently, although some authors and creative producers challenge obvious composition schemes and sometimes even create other types of structures, there is a strong tendency within the creative industry to reproduce schemes

[14] This work is available in both 360º video and VR format on YouTube. Cf. https://www.youtube.com/watch?v=RUmuUrrUVaw

like that of Larivaille, which are seen as formulas capable of ensuring the success of both written and audiovisual productions. In his research on bestsellers, characterized as "fictional narratives that sell well as products,"[15] Luís Fernando Prado Telles (2016) demonstrates that there is currently a true market for manuals of good narrative writing practices. Generally, these manuals "borrow from the repertoire of narrative theory, or narratology, the concepts that can easily be transformed into formulas or patterns to be duplicated"[16] (Telles, 2016, p. 31). Prior to this, as demonstrated by Charnay (2019), numerous literary education manuals had already transformed Larivaille's quinary scheme - along with other similar schemes - into excessively simplified patterns or formulas for understanding narrative structure.

As mentioned earlier, the fact that the literary and audiovisual tradition of narratives aimed at young and child audiences prioritizes sequential plots, many of them reproducing relatively simple narrative schemes, poses a challenge for creations and adaptations in Virtual Reality. This is because immersive environments contain, in their usage protocols, the need for free exploration of the 360-degree space, and therefore do not delimit the focus of attention *a priori*. This freedom can become a problem in the case of cinematic videos, which assume that the observer is able to recognize the main structural elements of the plot for the experience to be meaningful. In short, if the aesthetic proposal of the work is not based on a predominantly exploratory and dispersed reading protocol, it will be necessary to create mechanisms, devices, or strategies to direct and control the gaze.

4 Cinematic Virtual Reality

The field of study dedicated to analyzing and studying audiovisual works created and/or adapted for VR is known as Cinematic Virtual Reality (CVR). A researcher in the field, Kath Dooley (2021), highlights that works in VR can be divided into two categories based on the possibility of navigation. The first category concerns works that provide three degrees of freedom (3DoF), allowing the visualization of scenes by looking up and

[15] In Portuguese: "(...) narrativas ficcionais que se vendem bem enquanto produtos."
[16] In Portuguese: "(...) emprestam do repertório da teoria da narrativa, ou narratologia, os conceitos que podem facilmente ser transformados em fórmulas ou padrões a serem reduplicados."

down and rotating the head right and left from a central and fixed axis, as is the case with the narrative *Invasion!*, analyzed in the next section of this article. Such works are created as an equirectangular video file, in monoscopic (2D) or stereoscopic (3D) formats. According to the author, this type of format became available only from 2014, when high-quality 360-degree cameras were developed, and VR headsets became popular. The second category encompasses works that offer six degrees of freedom (6DoF). They allow for modification of the central axis, enabling movement forwards and backwards, left and right, up and down, within an integrated rectangular space, as exemplified in the work *The Great C*.

In general, most of the narratives currently available on VR content platforms still fall into the first category (Dooley, 2021), and both replace the camera perspective with the subjective perspective of the viewer, as they allow viewers to move through the virtual space by selecting angles and elements of interest during the experience (Peng; Xiaotong, 2017). As mentioned earlier, it is precisely this freedom to move the virtual body in all directions and perspectives (Henrikson *et al*., 2016) that makes it necessary to consider strategies to direct the viewer's attention towards the structural elements considered essential for the proper understanding of sequential narratives.

In order to resolve the tension between the freedom of focus and the need for attention to certain elements, Nielsen *et al*. (2016, p. 229) argue that it is necessary to provide Virtual Reality narratives with cues designed to draw the observer's attention to essential compositional elements. The researchers postulate the existence of two main types of cues: explicit and implicit. In brief, while the former explicitly communicate to the viewer that attention needs to be paid to a particular object, character, or event, the latter seek to draw attention in a more veiled manner.

Furthermore, the researchers also assert that these cues can be diegetic or non-diegetic. The concept of diegesis employed here originates from the structural theory proposed by Gérard Genette (1989) in his work *Figures III*, where the French theorist differentiated between the narrative content or narrated content - which is denoted by the Greek term "diegesis" - and the narrative process or enunciation, which refers to the instance of manifestation. When a cue is clearly positioned within the internal field of view of the virtual environment, being perceived not only by the viewer but also by the characters, it should be considered a diegetic cue. On the other hand, if the cue is only

within the observer's field of view and not that of the characters, it is a non-diegetic cue. Thus, in summary, in this theoretical model, there are four types of cues: explicit and implicit diegetic cues; explicit and implicit non-diegetic cues.

Explicit diegetic cues refer to any element of the narrative intentionally designed to limit the interaction of observers in the virtual environment, compelling them to shift their focus of attention. An example here could be the inclusion of a guide during a virtual tour. In this case, the "guide" acts as a limiting element of interaction since the observer is compelled to look at specific locations and events pointed out by this guide. On the other hand, some explicit diegetic cues do not limit interaction, such as a part of a dialogue or a character's gesture pointing in a particular direction in the virtual environment. Implicit diegetic cues, on the other hand, refer to "constraints in the environment, such as objects or virtual characters that force the user to change the path or direction of their gaze" (Nielsen *et al*., 2016, p. 229). The researchers emphasize that any salient object in an immersive narrative can serve as an implicit cue suggesting the need to change or redirect one's gaze.

Conversely, non-diegetic explicit cues refer to elements external to the narrative capable of creating some form of restriction or control. An example here could be the chaperone system[17] implemented in some HMDs (e.g., Oculus Quest) to ensure user safety while using the device. Non-diegetic explicit cues are avoided in VR narratives that aim to generate a high degree of immersion as they disrupt the illusion of presence within the representation, which is precisely one of the main objectives of an immersive system. However, in some experiments, signs like arrows or other icons can be used to aid with interaction. In *Invasion!*, this feature was not utilized.

Implicit non-diegetic cues are external elements that subtly direct the viewer's attention. An example can be found in systems that assume control of the viewing, such as the feature to rotate a stationary user sitting on a swivel chair or to transport them from one point to another in a virtual environment. In the VR work Evolution of Verse, produced by Chris Milk (2015), for instance, after a moment of free exploration of the environment, the camera takes control of the viewing point, guiding the observer above

[17] Chaperone system: it creates a virtual grid wall, customized by the user to fit their physical space. When nearing this boundary, the grid becomes visible and allows the user to see the real world, preventing them from falling over objects or colliding with walls or furniture.

the image plane and transporting them from one scene to another. In *Invasion!,* this feature was not included.

5 Invasion!

Produced by Baobab Studios (2016), the animated short film "Invasion!" tells the story of two aliens who arrive to conquer planet Earth, destroying anyone who tries to stop them. With a runtime of approximately 6 minutes, the narrative begins in outer space, with the aliens inside a spacecraft heading towards Earth. In the background, we hear narration by actor Ethan Hawke. Once on Earth, we encounter a white bunny that invites the viewer to play; as the story progresses, we are prompted to cooperate with the little protagonist's plan to thwart the invasion. The work received the 2017 Emmy Award and can be found for free on the Baobab Studios animation studio app, available on the Google Play Store and the Apple App Store.[18]

As far as the plot is concerned, Larivaille's quinary scheme is readily identifiable. The narrative begins with an idyllic scene featuring a frozen lake, snow-covered trees, and a playful bunny, setting the initial situation. The disturbance unfolds as hostile extraterrestrial beings arrive, as is shown by the way they destroy a bird flying over the lake. This marks the transformation, characterized by the ensuing conflict between the bunny and the aliens, culminating in the defeat of the invaders and their expulsion. Finally, the narrative concludes with the spacecraft reappearing in space, signaling their retreat.

[18] This narrative is also available on the YouTube video platform as a 360º video and for VR. Additionally, it can be downloaded for free from app stores for HMDs, such as Meta Quest (for Quest, Rift, Go and Gear VR devices) and Steam (HTC Vive, Valve Index, Windows Mixed Reality, etc.).
Cf. https://www.youtube.com/watch?v=SZ0fKW5PttM&t=4s

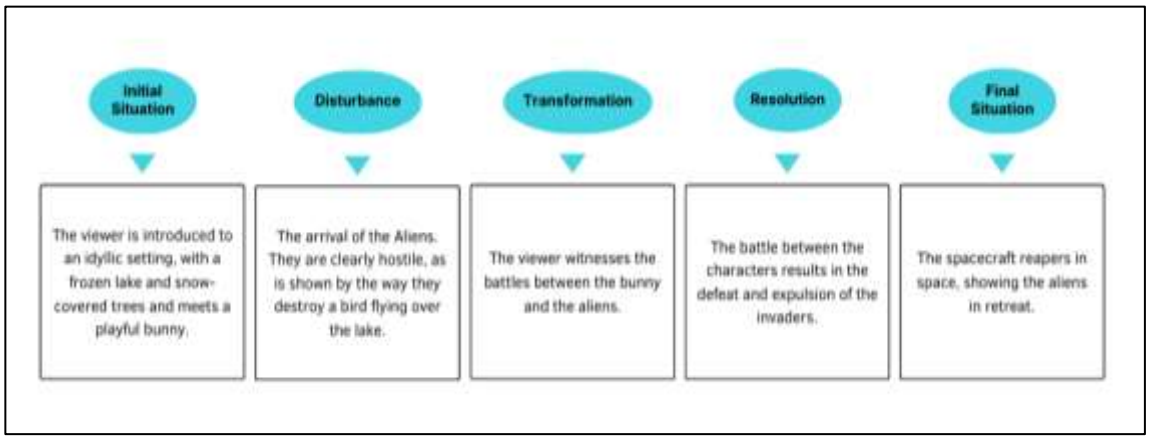

Figure 1. The Quinary Scheme of the Narrative. *Source*: Larivaille, 1974.

Figure 2. *Invasion!* (Initial situation). *Source*: ACM Digital Library (Bindman *et.al*., 2018)

Although the narrative can also be watched on a flat screen, to experience the sensation of inhabiting the same space as the other characters, it is necessary to use VR equipment. In the most common versions available for smartphones (such as Google Cardboard), it is possible to view the environment in 360º, but not one's own body. Yet, in the Oculus Quest and Rift versions, rabbit paws will be viewed instead of human hands, evoking the feeling of "inhabiting" the body of another rabbit within that universe. In both versions, Oculus Quest and smartphone, the interactions of the characters directed towards the viewer are implicit, as they depend on how the CGI animations (Computer Generated Imagery)[19] are configured, for example, when the bunny approaches the observer, trying to recognize their scent (Bindman *et. al*., 2018).

[19] Cf. https://www.cadcrowd.com/blog/what-is-cgi-and-how-do-3d-rendering-services-use-it/#:~:text=CGI%20is%20short%20for%20%E2%80%9CComputer,virtually%20indistinguishable%20from%20a%20photo.

Figure 3. *Invasion!* (Bunny approaches the observer). Source: ACM Digital Library (Bindman *et.al.*, 2018).

Among the types of cues outlined in the theory of RVC (Nielsen *et al*., 2016), it's clear that the piece exclusively utilizes implicit diegetic cues, precisely due to its emphasis on a deeply immersive aesthetic, as illustrated by the following examples. The first implicit diegetic cue in the work can be observed in the opening scene: it is a light that first directs the gaze towards the title of the narrative ("Invasion!"), and then towards a spaceship that starts moving towards planet Earth.

From the second scene onward, several implicit diegetic cues are used to direct attention to relevant points of interest for understanding the plot: along with a background sound of nature noises, a specific noise reminiscent of an animal moving and sniffing is discernible. These sounds aim to prompt the observer to look towards the distant trees. However, depending on their position and level of involvement up to that point, there may not be an immediate association between the sound effect and the visual source. For this reason, the designers also included an eagle flying towards the protagonist (who was previously hidden among the trees), intending to hunt it. This implicit diegetic cue is designed to ensure that attention is directed to the location of the bunny.

An approach of the rabbit sniffing and playing with the observer, shortly after the eagle disappears into the sky, is also used as an important implicit diegetic cue in this scene, as this feature has the potential to draw attention to the location of the main character.

The transition between scenes 2 and 3 is marked by implicit diegetic cues that anticipate the introduction of new elements. The first event can be observed when the little rabbit raises its ears, sensing the arrival of the aliens. Some movements of the rabbit, such as looking up at the sky, can guide the viewer in time and space. In the background,

it is possible to see the spacecraft approaching, performing stunts in the sky to capture attention.

Another implicit diegetic cue is present between scenes 2 and 3. It is the appearance of the spaceship in the environment, which immediately draws the focus of attention.

In scene 3, two more strategies for redirecting attention can be observed: the approach of the aliens and the disintegration of the eagle. In the first case, the aliens' frontal and direct gaze directed at the observer naturally tends to lead the attention to that point. The second case can be identified during a conflict between the aliens and the rabbit, as the latter tries to save the observer from the invaders' attack. In this situation, the rabbit's movements and gestures were the resources adopted by the designers to divert the aliens from their main target (the observer). Another interesting cue can also be noticed when the bunny moves away from the observer's viewpoint, and the aliens end up disintegrating the eagle with their laser beam. However, this cue appears briefly and, for that reason, may not be perceived, depending on the viewer's involvement and points of interest at that moment.

Visual and auditory cues were also used as cues in this work. The movements of the characters and the intonations of their voices, as well as the direct and frontal approach of the aliens when they descend from the spaceship, are resources employed here to guide the gaze.

Additionally, at the end of the third scene, when the rabbit finally "defeats" the aliens, the character looks back at the camera and winks at the viewer. This is another important cue, as it signals the narrative resolution, suggesting that the conflict has been resolved: the rabbit and the viewer together managed to thwart the alien invasion on planet Earth.

Final Thoughts

Throughout this article, we have sought to demonstrate that the narratives in VR currently available continue established narrative traditions among young audiences while also establishing new reading and usage protocols that need to be embraced for the

experience of engagement to be meaningful. Regarding the first aspect, as highlighted by Murray, no narrative tradition emerges out of nothing:

> (…) new narrative traditions don't arise out of the blue. A particular technology of communication – the printing press, the moving camera, the radio – may startle us when it first arrives on the scene, but the traditions of storytelling are continuous and feed into one another both in content and in form (Murray, 2016, p. 36).

In the field of children's and young adult literature, this continuity can be observed, for example, when we consider the emergence of the first narrative films aimed at children and young people. Kurwinkel (2018) highlights that these early cinematic works were adaptations of children's literary works, especially fairy tales and folk tales, such as Robinson Crusoe and Gulliver's Travels. Over time, there was a trend towards adapting narratives considered less canonical, encompassing fiction tales and folkloric elements. The silent film "A Trip to the Moon" (1902) by Georges Méliès, for example, was inspired by the work of Jules Verne (Kurwinkel, 2018).

On the other hand, while reproducing parts of older traditions, new media and formats also introduce their own protocols of reading and usage. Taking again the example of cinema aimed at children and young adults, the 1990s witnessed technical innovations, notably the integration of computer graphics. Since the release of "Jumanji" (USA, 1995), these techniques have established new standards of understanding, interpretation, and appreciation, thereby promoting new protocols of usage and reading. The codes that form these protocols have the potential to create a sense of defamiliarization among audiences accustomed to codes of previous traditions and, for that reason, need to be absorbed for works endowed with new protocols to reach their audiences as intended by their creators.

When comparing the differences between the reading protocols established by cinema with those that predominated in picture books, Tydecks (2018, p. 499) emphasized that studies in the field of media literacy and film literacy have revealed "that children need to acquire relevant cinematic codes to understand the story of a film" and that "[…] the reception of a film demands different media skills, which partially rely on those skills already acquired when attentively looking at a picture book." Similarly, in the case of new formats in VR, it is also necessary to understand and incorporate the protocols established

by this media so that the experience of enjoyment can be meaningful, which constitutes an important task to be taken on by educators interested in promoting media literacy. In the case of sequential narratives in 360-degree videos, as seen throughout this article, the main challenges posed to both the receiving audience and designers revolve around the need to manage the focus of vision and attention of viewers.

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Research Data and Other Materials Availability

The contents underlying the research text are included in the manuscript.

Reviews

Due to the commitment assumed by *Bakhtiniana*. *Revista de Estudos do Discurso* [*Bakhtiniana*. Journal of Discourse Studies] to Open Science, this journal only publishes reviews that have been authorized by all involved.

Review 1

The title is perfectly appropriate for the article; it is impactful and interesting. The intention is to discuss the use of virtual reality in 360-degree media, where the reader/observer participates as well. This is a new topic and needs to be investigated in more depth by Brazilian scholars; Furthermore, it is an innovative, engaging media, whose uses can be, and should be, used by our schools. The discussion is original and opportune – a good time for such an article! A very thoughtful article and a pleasure to read. ACCEPTED

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Review 2

Consistent, well-structured article, well-founded theoretical basis and good references. One suggestion, I would recommend including cinematic works and electronic games in this research, as the relationship between immersiveness and the use of diegetic and non-diegetic cues, implicit or explicit, to drive the narrative has been investigated in these for several decades. ACCEPTED

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