



# How Virtual Reality Compares to Other Media for Generating Empathy

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**Abstract.** In this study, the ability of various media types to elicit empathy is investigated and compared, including narrative text, audio, film, and virtual reality (VR). The results show how virtual reality has definite advantages in developing empathy and understanding. Due to its immersive nature, virtual reality outperforms other media formats in evoking empathy. This allows viewers to form stronger emotional bonds with the characters and their situations. Film falls short of VR's immersive qualities while narrative text and audio only partially engage viewers. Virtual reality also improves relatability and comprehension by enabling viewers to relate to the experiences depicted and gain a deeper understanding of the struggles of the characters. Overall, the potential of virtual reality to foster empathy is substantial, calling for additional study and technological development.

**Keywords:** Virtual Reality, Empathy, Media.

## 1 Introduction

The term "virtual reality" (VR) refers to an innovative form of human-computer interaction that generates the illusion of being present in a simulated version of the real world. In virtual reality, participants are free to navigate and explore the virtual environment, perceiving it from a variety of perspectives and interacting with it by reaching out, grasping objects, and even reshaping the digital space. The development of virtual reality is influenced by a variety of fields, including electronic and mechanical engineering, cybernetics, database design, real-time and distributed systems, simulation, computer graphics, human engineering, stereoscopes, and artificial life. Nevertheless, the creation of virtual reality systems is not without difficulty, as it requires overcoming obstacles in software development, hardware design, human factors, and the integration of high-speed networks. Therefore, it is more accurate to characterise virtual reality as the convergence of formerly distinct disciplines than as the establishment of a completely new technological field [1].

Virtual reality functions as a simulation medium, capable of simulating not only real-world experiences but also implausible or even impossible situations encountered in the real world. By utilising VR technology, individuals are able to

immerse themselves in environments that resemble their everyday environments, investigate uncommon or rare situations, and enter realms that defy the laws of reality. This versatility enables virtual reality to offer a variety of benefits and drawbacks, making it a compelling instrument in a variety of domains, such as training simulations, entertainment, education, therapy, and more [2].

When we refer to "empathy," we are referring to a psychological response that occurs when one comprehends and identifies with another person's circumstances or mental state. Emotional contagion, compassion, perspective-taking (simulation), and affective empathy are all components of empathy. The term "empathy" is frequently used by philosophers to define an emotional response that closely matches what the other person is experiencing or is expected to experience, with the other person as the primary focus. Moreover, empathy can also refer to an emotional response prompted by a situation resembling that of the other person [3]. In essence, empathy is the capacity to understand how others feel on an emotional level, to perceive the world from their perspective, and to position oneself in their shoes. By adopting another person's perspective, we can effectively comprehend and share their emotions.

This paper investigates and compares the significant impact of virtual reality on the development of empathy, focusing on its unique capacities as a medium for eliciting empathetic responses. In terms of their potential to foster empathy, it also compares and contrasts virtual reality with other media formats such as narrative text, music or audio, and films. Through a comprehensive examination of virtual reality's role in fostering empathy and consideration of its implications, benefits, and limitations in a variety of contexts, this study aims to provide a deeper understanding of virtual reality's distinctive characteristics and comparative efficacy in inducing empathy. This research aims to shed light on the distinct contributions of each element to emotional engagement, relatability, and the creation of awareness and understanding about the lives of refugees by analysing the responses collected from participants experiencing "Clouds Over Sidra" in different conditions, including narrative text, audio, film, and virtual reality. This research aims to provide valuable insights into the potential of various media elements for fostering empathy.

## **2 Literature Review**

### **2.1 Empathy**

Empathy is a multifaceted concept that is fundamental to how people interact with one another and form relationships. It entails having the capacity to relate to, understand, and share the feelings and experiences of others, which promotes prosocial behaviour and strengthens interpersonal relationships [4]. Numerous studies have looked at the various aspects and workings of empathy. Several fields including social psychology, developmental psychology, clinical psychology, neuroscience, and education have all looked into empathy. Empathy has been associated with beneficial outcomes in the field of social psychology, including cooperation, altruism, and moral reasoning [5]. It encourages the development of social bonds and acts as a catalyst for prosocial behaviour. Empathy is acknowledged as a crucial element of successful therapeutic

relationships and psychotherapy in clinical psychology. Empathic therapists foster a secure and encouraging environment that encourages client disclosure, comprehension, and emotional healing [6]. Across a range of therapeutic modalities, empathic interventions have been shown to improve treatment outcomes and client satisfaction.

Studies in the field of neuroscience have shed light on the neural processes that underlie empathy. The anterior cingulate cortex, insula, and mirror neuron system have all been linked to empathy in studies using neuroimaging methods like functional magnetic resonance imaging [7]. These areas play a role in processing emotions, gaining perspective, and reflecting the emotions and actions of others. Education settings are important places to apply empathy. Empathetic teachers foster a supportive learning environment, forge close bonds with their students, and aid in their socio-emotional growth. Empathy in the classroom is linked to increased student engagement, academic success, and social and emotional health [8].

## 2.2 How Virtual Reality Generates Empathy

How can we feel empathy while engaging with the immersive content of virtual reality? We investigate the complex relationship between virtual reality and empathy. By transporting users into simulated environments and allowing them to interact with the content therein, virtual reality (VR) offers a unique opportunity to elicit empathic responses. By immersing themselves in the virtual world, users may develop an emotional connection to the presented experiences and perspectives [10]. In the following paragraphs, we will delve into the profound impact of virtual reality on empathy, examining how this technology can elicit empathy and exploring the mechanisms underlying this phenomenon.

We can all see that one of the characteristics of VR is immersion. Immersion, also known as "immersive," refers to a made-up reality that appears to be very similar to our own, to the point where we are unable to distinguish between the made-up reality and the real world. Some researchers said that when they talk about "immersion," they are referring to "the technical ability of the system to create a believable environment that the participant can interact with" [11]. Technology features like tracking level, wider display fields of view, and stereoscopic visuals enhance the sense of actually being present even more than the calibre of the images or sounds do [12]. The degree to which a virtual reality (VR) user has the impression that they are in a specific location is referred to as "presence." When people are immersed in a virtual reality experience that makes them feel present, they respond, behave, and experience emotions in the same way as if they were in the real world [2].

Individuals may be prompted to feel empathy for other people through technology, and virtual reality may be a valuable tool in this endeavor. Virtual reality is frequently referred to as an "empathy machine" because it allows users to experience things from another person's perspective. Empathy machine is a term that refers to "any attempt to understand the emotional experience of another person through technology, typically with the goal of inhabiting another body." Because the empathy machine refers to "any attempt to understand the emotional experience of another person through technology," the user can more fully share the experience. For example, demonstrators

at a political rally more deeply understand the plight of a displaced refugee or have greater identification with the content of a political speech through VR [13].

Based on the video that can be found on YouTube, (it is a ten-minute video, TED Talks by Chris Milk), during his presentation on the video, he screened a short video on Sidra, a 12-year-old Syrian girl who lives in a Jordanian refugee camp. It is a 360-degree virtual reality (VR) video by the United Nations. When we wear a virtual reality headset, we can view all directions simultaneously. We get the unmistakable impression that we are simultaneously there with her; consequently, we are more sensitive to the fact that she is a person. We are acquiring a deeper capacity for empathy with them without even realizing it. Even if we see it, it can increase our sympathy for those individuals [2]. Chris Milk gave a clear and detailed explanation, which helped the author show how virtual reality can make people more empathetic.

What we mean when we talk about "immersion" is the technical ability of the system to create a believable environment that the participant can interact with [11]. The ability of a virtual reality (VR) device's media to successfully transport us away from our actual surroundings is referred to as "immersion." Immersive virtual worlds can rupture the deep and habitual connection between where our senses tell us we are and the actual location of our bodies and the people we interact with. The phenomenon of behaving and feeling as if we are in a computer-generated virtual environment is called "presence," a concept related to the phenomenon [2].

### 2.3 Comparing VR to Other Media in Empathy

When you compare virtual reality (VR) to other media, the ability to make people feel empathy stands out as a big difference. Researchers have found that the immersive and embodied nature of VR gives a unique sense of presence and control, which makes it easier to feel emotions and empathise [10]. Although virtual reality (VR) offers a very immersive experience, it's crucial to understand that other types of other media, including audio, narrative text, and film, can also elicit empathy in their own unique ways. Each medium employs a different set of senses and storytelling strategies, providing special chances to elicit empathy from the audience.

Podcasts and music are examples of audio-focused media that have the power to evoke feelings just by using sound and music. Audio narratives enable listeners to engage with the story and characters on an auditory level by utilising the power of soundscapes, dialogues, and musical compositions. The lack of visual cues draws the listener's focus to the audio environment, which improves their capacity to emotionally connect with the story [15]. Narrative texts can encourage readers to visualise scenes, identify with the characters, and develop a strong emotional connection with the narrative by skillfully constructing prose and utilising vivid imagery. The reader's active involvement in creating the story's world enables a unique interpretation and level of involvement that promotes empathy [16].

In contrast, film uses a combination of performances, cinematography, and visual storytelling techniques to arouse empathy. Viewers can visually interpret the characters' emotions, body language, and facial expressions through the medium of film. A multisensory experience that fully immerses the viewer in the narrative and

fosters a stronger empathic response is produced when visual and auditory components are combined [17].

### 3 Research Methodology

The objective of the research methodology used in this study was to examine how “Clouds Over Sidra” affected viewers under various viewing circumstances. “Clouds Over Sidra” is a virtual reality film that immerses viewers in the daily life of Sidra, a 12-year-old Syrian refugee in the Za'atari refugee camp in Jordan. It aims to increase understanding and compassion for refugees by providing a first-person account of their daily struggles and aspirations. It has been utilised as an advocacy and educational tool to promote understanding and compassion for refugees.

Audio-only, narrative text, 2D film viewing via YouTube, and virtual reality (VR) using a headset were the four distinct conditions that were looked at. There were a total of 20 volunteers who agreed to participate in the study, with 5 respondents in each condition.

The subjects were exposed to the predetermined viewing circumstances in order to gather data. In the audio-only condition, participants only listened to the audio or sound, while in the narrative text condition, participants read the textual narration. The participants who underwent the 2D film viewing condition watched the movie on YouTube, where they saw it in a standard flat format. However, those who participated in the VR condition had the chance to fully immerse themselves in the movie using a VR headset, making for a more engaging and interactive viewing experience.

After the participants had been exposed to the predetermined viewing condition, they were asked to give their feedback by completing an online survey using a Google Form. The survey used a series of Likert scale questions to gather information about the respondents' thoughts and experiences with the movie.

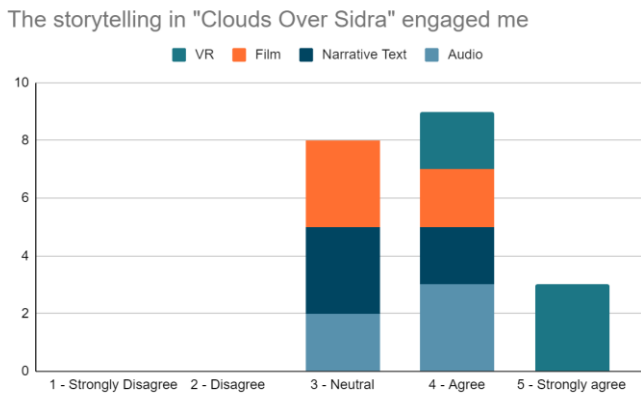
**Table 1.** List of Questions.

No	Question
1	The storytelling in "Clouds Over Sidra" engaged me.
2	I found "Clouds Over Sidra" enjoyable.
3	“Clouds Over Sidra” evoked emotions and empathy towards the characters.
4	I found the experiences relatable.
5	“Clouds Over Sidra” successfully created awareness and understanding about the lives of refugees.

On a Likert scale, the participants were asked to rate how strongly they agreed or disagreed with each statement, with options ranging from 1 (strongly disagree) to 5 (strongly agree). This study used participant responses to elicit information about how viewers perceived and interacted with the movie "Clouds Over Sidra" in various media

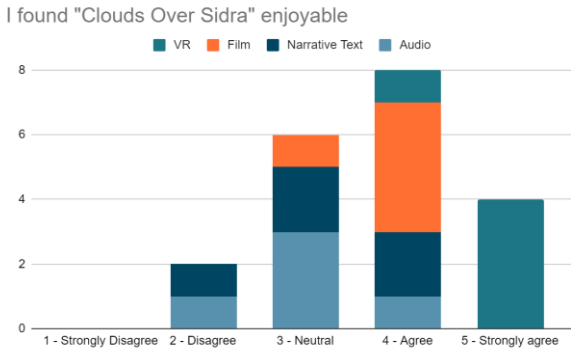
environments. The results from the respondents' feedback will be explored in the following paragraphs.

Fig. 2 showed the majority of respondents stated that the narrative text, audio, film, and virtual reality (VR) formats of "Clouds Over Sidra's" storytelling maintained their interest. However, more respondents in the film and VR conditions strongly agreed or agreed with this statement compared to the narrative text and audio conditions, indicating a higher level of engagement. In the film condition, where viewers watched the movie in traditional 2D format, a sizeable portion of respondents strongly agreed with the engagement aspect. The visual elements and audiovisual presentation most likely greatly attracted and maintained their attention. Due to its immersive and interactive experience, the VR condition displayed a higher level of engagement than the other conditions. The ability to enter a virtual environment and be surrounded by the fictional world improved the sense of presence and emotional connection. The narrative text and audio conditions had slightly lower levels of engagement agreement. This difference might have been brought about by the lack of immersive and visual components.



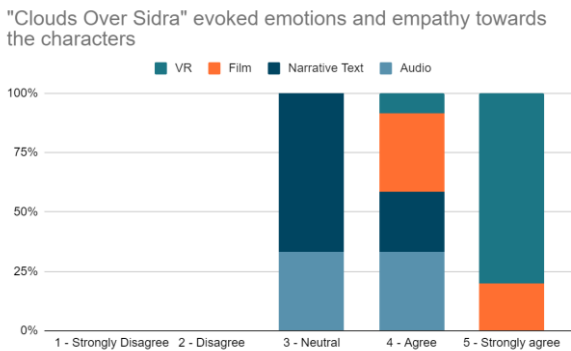
**Fig.2.** Respondents' Responses to Storytelling

Fig. 3 showed that everyone who responded in the VR condition said they enjoyed the experiences. This demonstrates a high level of satisfaction and a favourable response to the film. This widespread enjoyment was probably influenced by the immersion components used in the film format. However, there were a variety of reactions regarding enjoyment in the audio condition. Despite the fact that the majority of respondents agreed that they enjoyed the audio, it is important to note that one of them didn't. This variation in responses suggests that the audio-only format may have had some difficulties engrossing and engaging the audience, which could have led to different degrees of enjoyment. Overall, the results show that "Clouds Over Sidra" has been well received under all circumstances, with the VR and film format producing the highest levels of agreement regarding enjoyment. Although generally well received, the audio condition displayed some variation in responses, suggesting a possible effect of the absence of visual components on the overall enjoyment of the narrative.



**Fig.3.** Respondents’ Responses to Sense of Enjoyment

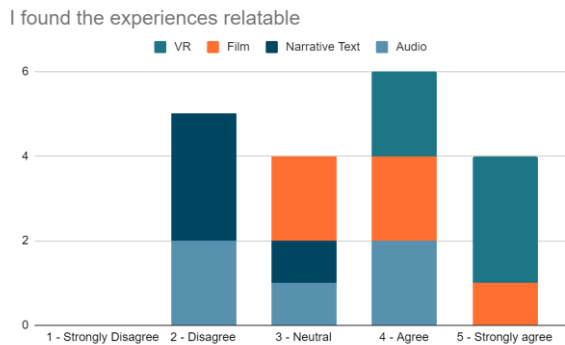
Fig. 4 demonstrated the emotional impact and capacity of "Clouds Over Sidra" to evoke empathy for the characters. The results showed that most respondents agreed with or strongly agreed with this aspect of the movie. This may indicate that the narrative and storytelling strategies used in the movie were effective in evoking emotional reactions and encouraging a sense of empathy in the audience. The VR condition was found to be the most effective at producing a strong emotional response. A sizable portion of participants in the VR condition strongly concurred that the movie elicited feelings and empathy for the characters. This finding suggests that greater emotional engagement was facilitated by virtual reality's immersive and interactive features. The audience's emotional connection to the characters and their story was probably amplified by being able to watch the movie in a three-dimensional, immersive setting, which increased the overall impact of the movie.



**Fig.4.** Respondents’ Responses to Sense of Emotions and Empathy

Fig. 5 showed the respondents' reactions to how relatable the experiences in "Clouds Over Sidra" were varied. While some participants connected with the experiences, others disagreed or remained unresponsive. The varying responses show that

reliability is a subjective concept that can vary based on personal histories, perspectives, and experiences. It's interesting to note that more respondents in both the film and VR conditions agreed or strongly agreed with the statement about reliability. This suggests that under these viewing circumstances, viewers had a more immersive and interesting experience, which increased their sense of reliability. This increased sense of connection with the experiences depicted in the film was probably made possible by the visual and immersive elements present in the film format as well as the additional layer of immersion provided by the VR environment. However, compared to the other viewing conditions, the film and VR conditions were successful in eliciting a higher level of agreement from the respondents, demonstrating a greater sense of reliability.

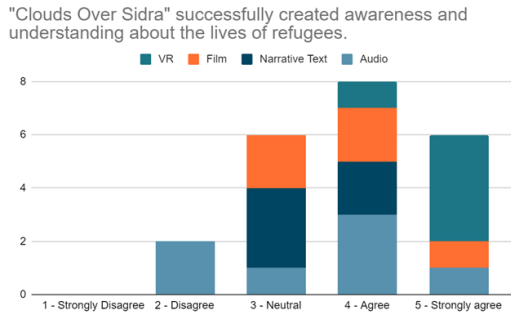


**Fig.5.** Respondents' Responses to Sense of Reliable Experiences

Fig. 6 showed that "Clouds Over Sidra" successfully accomplished its objective of raising awareness and fostering understanding about the lives of refugees under all viewing circumstances. The majority of respondents either agreed with this aspect of the movie or expressed no opinion. This shows that the movie was successful in getting across key points and details about what it's like to be a refugee, raising awareness among the audience. The highest percentage of respondents who strongly concurred that the movie raised awareness and understanding was found in the VR condition, which is noteworthy. This suggests that using virtual reality could improve the movie's capacity to fulfil its educational goals. The immersive quality of the VR experience most likely contributed significantly to the development of a deeper and more significant understanding of the refugee situation. VR technology can foster a greater sense of empathy and a better understanding of the difficulties and circumstances faced by refugees by immersing viewers in a virtual environment that closely resembles their actual circumstances. Overall, the results show that "Clouds Over Sidra" was successful in spreading knowledge and promoting comprehension about the experiences of refugees under all circumstances. The VR condition, however, stood out as being particularly effective, highlighting how virtual reality has the potential to be a potent tool for immersive storytelling and educational experiences. Virtual reality has the power to immerse viewers in various worlds, encouraging a higher level of engagement



and empathy. This increases the efficiency with which films like "Clouds Over Sidra" can raise viewers' awareness of and empathy for significant social issues.



**Fig.6.** Respondents' Responses to Sense of Awareness

Overall, the findings show that "Clouds Over Sidra" successfully sparked feelings and encouraged empathy under all circumstances. The VR condition, on the other hand, stood out as being particularly potent, highlighting the potential of virtual reality as a powerful medium for inciting strong emotional responses and enhancing viewers' experiences with empathy.

## 4 Conclusion

In this research, the ability of narrative text, audio, film, and virtual reality (VR) to evoke empathy was examined. The findings show that VR's immersive qualities give it a distinct advantage over other formats in evoking empathy. With VR content, viewers can become fully immersed, developing a stronger emotional connection and empathy for the characters. While narrative text and audio are still used in traditional media, VR offers a more immersive experience. Although visually appealing, film can't compete with VR for immersion. VR also improves understanding and relatability, enabling viewers to relate to experiences and gain a deeper understanding of character struggles. Although VR has the potential to be transformative, accessibility, cost, and any potential drawbacks should be taken into account. To fully exploit VR's empathy-building potential, more study and technological development are required. This study concludes by emphasising how well virtual reality (VR) works to evoke empathy, providing special benefits in narrative interaction and comprehension of others' experiences. Future research should produce VR-specific narrative and material. Researchers can improve sympathetic response and audience engagement by refining storytelling and VR immersion. This may incorporate new ways to combine interactivity, multi-sensory signals, and personalised storylines into VR platforms to enable for more personalised and powerful content engagement. Future study could also examine VR's long-term effects on empathy and behaviour. Understanding how prolonged VR exposure affects real-world attitudes, perceptions, and behaviours can help social impact and empathy-driven projects use VR.

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