

Interpersonal Communication Research in Metaverse —Taking Si-Fi Films as Examples

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ABSTRACT

As an extension of the human body, media in different forms shape different characteristics of interpersonal communication. In the next generation of Internet communication forms, “Metaverse” uses VR, AR, MR, XR and other media technologies to break the boundary between virtual and reality, making interpersonal communication more complex than before. This paper explores the possible new features of interpersonal communication in the context of the “Metaverse”. Since the overall “metaverse” picture has not yet been fully realized, this paper selects science fiction films that embody the concept of “metaverse” as a frontier sample for the study of future interpersonal communication patterns. Through the content analysis of 11 science fiction films, some new features of interpersonal communication are summarized. For example, the source of communication is a human individual with a virtual avatar. Virtual characters can be divided into having or not having an entity and an autonomous mind. The communication space in the Metaverse contains both real and virtual worlds. People are experiencing multi-sensory experiences communication channels and so on.

Keywords: *interpersonal communication; Metaverse; science fiction films; virtual reality; media technology*

1. INTRODUCTION

Canadian scholar Marshall McLuhan’s media extension theory considers that media can increase the range and power of part of the human body [1]. From oral communication to text communication to printing communication to electronic communication [2], communication media technology has externalized human senses and the function of processing and remembering information. With the emergence of digital media represented by the Internet, scattered media of text, audio, pictures and images have been integrated into the interconnected communication system, and individuals can also create free connections and diverse interactions through the Internet. The integration of media functions and the “decentralized” nature of the Internet has weakened the power of mass communication and made interpersonal communication increasingly important. This integration and decentralization will be further enhanced in the next-generation version of the Internet, the “Metaverse”.

The term “Metaverse” first appeared in the novel *Snow Crash*, published in 1992. In *Snow Crash*, the

author Neal Stephenson created a three-dimensional virtual space where everyone could enter and interact with other people and system artificial intelligence using virtual avatars. Although there is no standard conceptual definition of the metaverse, it is recognized that the metaverse has the following four core properties: 1) Metaverse virtual space and the real world to maintain a high degree of synchronization and intercommunication, interaction effects close to the real. 2) Through technology open source and platform open source, users can carry out independent innovation and creation in the Metaverse to build an original virtual world. 3) The Metaverse will operate in an open source manner and continue to evolve indefinitely. 4) Economic system with closed-loop operation [3]. The development of technology provides a realistic basis for Metaverse. The market also senses the great potential of Metaverse, and giants such as Facebook and Microsoft have been laying out Metaverse products. According to ‘Metaverse Market’ published by Emergen Research Company, the global metaverse market size reached USD 47.69 billion in 2020 [4]. Besides, according to Bloomberg industry

research, the market size of the Metaverse is expected to reach \$800 billion by 2024 [5].

Langdon Winner argues that technology initiates a trend that inevitably reconfigures the world [6]. Interpersonal communication paradigms and features have also been reconfigured under the development of Metaverse. Although the picture envisioned of the “Metaverse” has not yet been fully realized, the explosion of technology has made science fiction films and real science only a stone’s throw away. Therefore, this paper selects science fiction films that embody the element of “Metaverse” as samples for content analysis to describe, summarize and conclude, in order to explore new paradigms and features of interpersonal communication. The films were chosen from the Saturn Awards, the highest honor for science fiction films. The concept of “Metaverse” is derived from the 1992 novel “Snow Crash”, so the selection of this article is based on the best science fiction films and nominees of the Saturn Awards from 1992 to 2021. Based on the features of the Metaverse described in the previous section, a total of nine films were screened to meet the analysis requirements. They are *Virtuosity*, *The Matrix*, *The Thirteenth Floor*, *eXisten Z*, *Avatar*, *TRON: Legacy*, *The Zero Theorem*, *Blade Runner2049*, *Ready Player One*. On this basis, two additional films, *Her* and *Free Guy* are added, which were not awarded or nominated, but whose scenes and elements fit well with the Metaverse concept and can serve as good samples for analysis. These 11 films will serve as the sample base for content analysis in this study.

Current research on the Metaverse has focused on the definition, technology, philosophy and ethics, applications in distance education and games, and less on the field of interpersonal communication. In such a virtual and reality interconnected, open source world, people can break through the restrictions of gender, age, nationality, race, etc., and choose a “virtual avatar” to enter the virtual world. VR/AR/MR and other extended reality technologies will bring highly intelligent and real-time interactive immersive communication experiences, and all human senses, including touch will be no different from reality. In the Metaverse world, the multiplicity and virtual nature of the subject’s identity and the interactive characteristics of the virtual-real combination of communication scenes will change the paradigm of interpersonal communication. This study will further enrich the research perspectives on Metaverse, while adding features about the next

generation of interpersonal communication patterns, following the studies on face-to-face interpersonal communication and online interpersonal communication.

2. THEORY OF INTERPERSONAL COMMUNICATION

Interpersonal communication is verbal and non-verbal interaction between two or more people, that exists in an interpersonal continuum. The elements of interpersonal communication include: (1) Source-receiver. Each person has both the function of forming and transmitting information, and the function of receiving and understanding information. (2) Encoding-decoding. It means the act of generating and understanding a message. (3) Message. It includes verbal and nonverbal language, such as body language or hearing, vision, touch, smell, taste, and so on. (4) Channels. Communication is usually carried out simultaneously through multiple channels. (5) Noise. Specifically, there is physical noise, physiological noise, psychological noise and semantic noise, etc. (6) Context. It involves physical context, temporal context, psychosocial context, cultural context, etc. (7) Ethics (8) Competence. It is the ability to communicate interpersonally. In addition, according to previous research, Joseph summarized the purpose of interpersonal communication into five dimensions: 1) Study: self-awareness, understanding of others and the world; acquiring various skills. 2) Pleasure: avoiding work , entertainment 3) Supportiveness: showing appreciation and concern for others; sharing feelings with others and to alleviate loneliness. 4) Control: influencing, controlling and guiding others. 5)Relationship: establishing and maintaining interpersonal relationships. The study will use this as a theoretical framework to study the features of interpersonal communication in Metaverse related science fiction movies [7].

3. INTERPERSONAL COMMUNICATION ANALYSE IN SI-FI FILMS

3.1. Sample films description

The following table extracts the elements about the meta universe and their symbolic symbols in these 11 films to show the basic background of these films in interpersonal communication.

Table 1. Metaverse related elements and representational symbols in sample films

Film	Metaverse related elements	Representational symbols
Virtuosity	Virtual world	Virtual reality simulation software, which is used to train police officers to apprehend criminals.

The Matrix	Virtual world ; Open source	Virtual reality simulation software is used to train the fighting ability. There are multiple spaces in the film such as the real world and the virtual human society. Multiple spaces can be highly interactive.
The Thirteenth Floor	Virtual world ; Open source	There are three worlds from different years, one of which is real and the other two are virtual worlds in the game.
eXisten Z	Virtual world ; Open source	A large virtual game world consists of several smaller virtual worlds.
Avatar	The digital avatar of humanity ; Everything is connected ; A closed-loop economic system	Avatar, the doppelganger of humanity on Pandora; Biological neural network;
TRON: Legacy	Virtual world ; Open source	Virtual game worlds; Virtual characters in this world can evolve on their own and operate in a closed loop.
The Zero Theorem	Virtual world	A virtual game world ;
Blade Runner2049	Virtual world ; Reality and virtual are highly interactive.	A virtual girlfriend that can be projected into real life ;
Ready Player One	Virtual world ; Open source ; A closed-loop economic system;	Virtual game world "Oasis"; currency in "Oasis" can be used for offline spending; "Oasis" has a variety of different styles of planets and cities.
Her	Virtual Characters;Open source;	Virtual characters can highly interact with reality and realize various functions, such as chatting, accompanying, processing work, and rapid iteration and growth in the digital world.
Free Guy	Virtual world ; Open source;	Virtual game world; The characters in the game can interact with real players in a highly realistic way.

3.2. *Interpersonal communication analyse*

Based on a content analysis of these films, interpersonal communication in the context of the metaverse has the following characteristics.

3.2.1. *Traditional interpersonal communication purpose*

“Virtuosity” and “The Matrix” both use virtual worlds to create ideal training sites to train the main characters in skills. “Ready Player One” and “Free Guy” fully embody the entertainment function. “Blade Runner 2049”, “Her” in which the protagonist aspires to establish a real emotional connection with virtual characters. In the movie “Her”, the virtual girlfriend has the function of deep learning. After knowing all the deeds and works of the male protagonist, she even knows his inner thoughts

better than he does, which helps the male protagonist to have a better understanding of himself. In TRON: Legacy, the protagonist and his father intentionally share knowledge and information about the human world with Kuora, an artificial intelligence-generated digital human. Therefore, the purposes of interpersonal communication in the context of metaverse are mainly study, including self-awareness, acquiring skills, etc.; establishing and maintaining interpersonal relationships; entertainment; and support, such as helping virtual characters grow.

3.2.2. *Virtual doppelganger communicator*

Real-life individuals are the subjects of interpersonal communication in the Metaverse world. Individuals can create their own virtual images and even accents at will, making communication anonymous and multiple, with easy role changes [8]. In Ready Player One, for example, the main character can instantly change his image to hide

his true identity. The significance of this behavior, as reported in a Facebook study, is that people consider the virtual social environment to ease their embarrassment of meeting strangers for the first time in real life, while also increasing their confidence [9].

In addition, virtual avatars can also reduce discrimination caused by gender and race in real life. However, as an "avatar" symbol of the subject, the virtual identity always carries the identity reflection of the real-world individual, even if this reflection is reversed. For example, in "The Zero Theorem", the main character is a bald geek in the real world, but in the virtual world, he is handsome and humorous. When the subject is constantly switching between real and imaginary identity roles, it may also cause people to confuse their identity, not knowing which one is their real self. This virtual world takes digital technology as the main body, reshaping the value and significance of "identity".

3.2.3. Virtual receiver

The receiver of interpersonal communication can be either a human individual, such as a real player in the game world, or a virtual character. Virtual characters can be divided into having or not having an entity and an autonomous mind. Such as in "TRON: Legacy" "Free Guy", the artificial intelligence characters evolved autonomous consciousness and they look and think like humans. Their existence can make humans blur the line between real and virtual. In addition, artificial intelligence with autonomous minds may have unexpected communication behaviors, which unintentionally transfers the right of communication. The virtual girlfriend in Blade Runner 2049 does not exist as an entity, but her 3D virtual images can be projected in real life through holographic projection or other devices. Samantha, the virtual operating system in "Her", also does not exist physically. When the male protagonists in the movie treat the virtual characters as their girlfriends and become emotionally involved, they suddenly discover that the same virtual product can serve countless human users at the same time. Similarly, the traits of "considerate" and "individuality" in communication are only part of what is set. As a result, the protagonist develops doubts about love, a sense of emptiness in life, and a dilemma of perception of human subjectivity. In addition, the receiver of communication in the metaverse can be either one person or many people. In "Ready Player One," for example, the male protagonist can use his own broadcasting device to initiate a real-time call to all players in the game.

3.2.4. Communication context of virtual and real interaction

The communication space in the Metaverse has been greatly expanded to both the real and virtual worlds. The

source and receiver can be in the same space in the same world for face-to-face communication, or in the same world but in different spaces or in different worlds. In Ready Player One, players in the real and virtual worlds can communicate via holograms or communication devices. If they are all in different spaces of the virtual world, players can communicate with each other over long distances through the wearable devices that come with the game. In short, the communication space of Metaverse is a mixture of multiple communication spaces, and people's communication behaviors in the virtual space can be transferred from online to offline. In terms of communication time, both synchronous and asynchronous communication can occur.

3.2.5. Multi-sensory communication channel

With the help of wearable devices, brain-computer interfaces, XR and other devices and technologies, communication in the Metaverse will bring a multi-sensory experience, realizing fully immersive communication that integrates text, 3D vision, hearing, touch, and smell. As Mark Hansen points out, new media technologies have realigned the relationship between the body and technology. Technology attempts to remediate the relationship between our bodies and the world through motion capture, sensory stimulation, visual interfaces, and more. The way people perceive the world will shift from a visual-dominated perceptual experience to an experiential experience dominated by the whole body[10]. However, such immersive communication may cause discomfort to communicators and may even make people feel threatened and afraid because it is too real. For example, in Ready Player One, the wearable device worn by the player can transmit the pain that the player feels when he is attacked in the game. In Virtuosity, a police man died when he was attacked by a virtual criminal because the sensitivity calibrations of his wearable device failed to be adjusted.

As Metaverse technology continues to evolve, it is possible that future communication channels will rely on biological neural networks for the interconnection of everything, as demonstrated by the planet Pandora in Avatar. On the Pandora planet of Avatar, nature and human tribes share the same information network. Each creature can communicate with an intelligent tree, equivalent to the host of the planet Pandora and flying dragon, equivalent to the intelligent traffic of the planet Pandora through the peripheral nerve. They can also be free to upload and download information from the network. The Na'vi's braids are the leaking nerves, that allow the Na'vi to connect with animals and plants, and transmit information through the biological neural network, so as to realize the interconnection of all things and spread without obstacles. For example, in "The Matrix", when rescuing Morpheus, Neo asks the operator

in the real world for a weapon, and after entering the code, the weapon Neo needs appears in the virtual world.

3.2.6. *Specific communication rules*

Both verbal and non-verbal communication messages can be communicated in the Metaverse immersive environment. Except for text messages, solid material can also be transmitted due to the open source of the Metaverse. For example, in “The Matrix”, when rescuing Morpheus, Neo asks the operator in the real world for a weapon, and after entering the code, the weapon Neo needs appears in the virtual world.

Besides, the information can be saved permanently and people can also return to the previous communication scenario, allowing the same information to be communicated again. For example, in Ready Player One, the heroine sums up her failure experience and returns to the same scene again, and finally succeeds in getting the information she wants. People need to abide by the rules of communication in the virtual world. In eXisten Z, if communication is paused, the next time players restart the act of communication, they need to repeat the last sentence of the previous dialogue and call the name of the Non Player Character in the game to restart the conversation. In addition, people may treat virtual characters in a rude way when communicating due to they are not real humans.

3.2.7. *Underlying noise*

Wearable devices collect physiological information about the user, including heartbeat, pupil size, tone of voice, syntax, etc. Individuals are out of privacy or nervousness, which may lead to unnatural communication. The Thirteenth Floor and eXisten Z both reflect that when the boundary between virtual and reality is blurred, players will have a certain feeling of temporal, spatial and identity dislocation and need some time to adapt to the environment they are in, which brings a certain amount of psychological noise to the communication. Furthermore, interpersonal communication in Metaverse is not absolutely free, and game developers act as “gatekeepers” for virtual games. For example, in Ready Player One, the game company can intervene, restrict or remove the accounts of players who do not comply with the rules of the virtual world.

The physical noise in traditional interpersonal communication is also present in Metaverse. Communication behavior can be permanently suspended with device damage, operating system upgrades, and data wiping, or even impossible to resume. Communication in the virtual world can also be interrupted by events in real life, forcing the player to take a break to deal with problems in the real world.

4. CONCLUSION

To summarize, some interpersonal communication features in Metaverse are similar to face to face and online interpersonal communication. For example, the purposes of communication are basically the same as those summarized by previous authors, mainly learning, entertainment, helping, etc. There are still gatekeeper roles and physical noise. Both synchronous and asynchronous communication may occur. However, there are more complex features existing. For example, the source of communication is a human individual with a virtual avatar, whose virtual identity is anonymous, multiple, and convenient to change roles. The receiver can be either human individuals or virtual characters. Virtual characters can be classified according to whether they have a physical body and are able to think independently. The communication space in Metaverse contains both real and virtual worlds. Both communicators can be in the same space in the same world for face-to-face communication. They can also be in different worlds or in different spaces within the same world. It can also be a mixture of multiple communication spaces, and people's communication behaviors in the virtual space can also be transferred from online to offline. In terms of communication channels, people experience multi-sensory experiences. The message can even be material entities except for verbal and non-verbal language. Messages can also be permanently stored and repeatedly communicated. The sense of confusion brought about by the blurred boundary between virtual and reality may cause psychological noise, etc.

On the academic side, this paper enriches the research system of metauniverse. It also proposes new features of next-generation interpersonal communication and reveals the process of interpersonal interaction in virtual reality situations, laying the foundation for other scholars to carry out subsequent research. For example, virtual avatars make the act of communication equal to a certain extent, increasing confidence and alleviating embarrassment in social situations, but this equality is not absolute. The confusion between real and virtual identities, and the limited technical and financial support to construct virtual identities can create new problems for communication. These new features bring about topics that require deeper thinking and further research. On the practical side, it points out that there may be problems, such as the underlying noise part mentioned, providing clues for improving virtual reality product design.

There are some limitations in this paper. Only the preliminary features of interpersonal communication are discussed, and what impact these features will have on interpersonal interaction and communication effects is yet to be further explored. In addition, this paper takes science fiction movies as examples and lacks realistic cases. In further research, as more real-life examples of

virtual reality interactions and data become available, the author will continue to explore the impact of the new paradigm of interpersonal communication on interpersonal relationships as well as communication effectiveness.

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