An investigation into the causes of science fiction animation influencing young people's awareness of science and technology based on the DIMT model - Love, Death and Robots as an example

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Abstract: As a medium, science fiction animation has a special significance for the construction of science and technology awareness among youth. As the science fiction animation market is booming and popular among young people, it is more and more urgent to explore ways to improve the impact of science fiction animation. This research report analyzes the science fiction symbolic landscape presented by the animation through the questionnaire analysis and interviews of Love, Death and Robots, and explores the meaning construction of the science fiction symbols in the animation and the dissemination path of the scientific spirit kernel, in order to explore the law of its construction of science and technology consciousness for young people, with a view to providing some reference for the innovative development of science fiction animation in China in the future.

1.Introduction

With the gradual development of Chinese science fiction animation, original, popular, innovative, diverse and local science fiction animated shorts are developing in a multi-dimensional manner. Love, Death and Robots", a three-season science fiction animated short film series produced by Netflix from 2019-2022, has received a lot of attention and a high VOD rate, with a new mode of distribution, a multi-line narrative, and a variety of stylized audiovisual impact. The animated short film has a novel symbolic metaphor of "breaking the circle" and 18 science fiction animated stories with an average length of about 15 minutes, which quickly set off a storm of audience interaction under the new media vision.

This research report focuses on the science fiction animation "Love, Death and Robots" (hereinafter referred to as "Love Death Machine") as a case study, through online questionnaires, based on the "Word-Image-Ideal-Tao" (DIMT) model. Through an online questionnaire, the report considers how science fiction animation raises the awareness and literacy of young people in science and technology and the reasons behind it, analyzes the important role of science fiction animation in spreading relevant scientific knowledge, helping young people to accept scientific concepts and enhancing scientific and cultural values, and proposes reflections and suggestions.

2.Reflections on the current situation of science fiction animation

2.1. Reflections on the current situation

In this paper, an online questionnaire and data collection were conducted for the science fiction animation fans, and 194 valid questionnaires were returned. The questionnaire data reflect that the majority of young people are still watching science fiction animation in Japan and the United States (Fig.1).
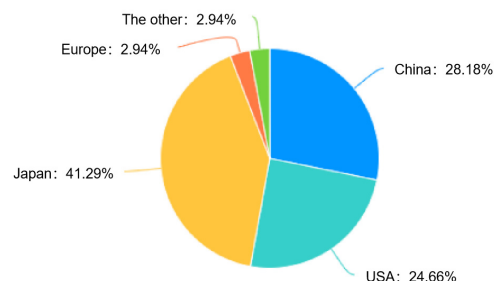

Fig. 1. Watch the national science fiction animation scale

Most of the teenagers who watched "Love Dead Machine" were concentrated in social media platforms and short video platforms, which shows the high stickiness of the youth group with online platforms nowadays. The sample was screened by the

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questionnaire "Have you ever known the plot of "Love Dead Machine" in three seasons", and the data was cleaned by this question to get a total of 127 samples who have watched and known the science fiction animation for the follow-up survey.

2.2. Reflections on the current situation

Combing through the existing studies on science fiction animation, most of them take a single science fiction animation as an embedded point for inquiry and analysis. There is a narrative study of My Three Bodies from the perspective of textual analysis, and there is a consideration of Future Machine City from three perspectives of world construction, characterization and humanistic essence. Tang Mengxiao in "Analyzing the genre interest of domestic science fiction online animation" recognizes the increasing influence of science fiction animation, and explores the aesthetic appeal of the audience by analyzing the story setting, female image and science fiction energy of online science fiction animation. From the colonial theory of Orientalism, Zhou Ziyu analyzes the imagination of "Chineseness" and related elements in Love, Death and Robots, from the dimensions of story selection, text adaptation, characterization and video narrative. In this paper, we analyze the "Chineseness" imagination and related elements in "Summer Battle", from its story selection, text adaptation, characterization and video narrative, to provide interdisciplinary theoretical ideas and real creative significance for the further creation and exploration of domestic short films. They lack the analysis and grasp of science fiction animation for young people, and focus mostly on specific practical phenomena, but less on the core of science fiction animation's scientific spirit, and to some extent ignore the deep mechanism of science fiction animation's influence on young people's science and technology awareness and literacy and the reasons behind it. This research report starts from the DIMT theory of oriental semiotics introduced by Professor Li Tao in the classroom, and selects the time-extended and representative "Love, Death& Robots" from science fiction animations for symbolic analysis, to explore the symbolic paths of excellent science fiction animations for meaning construction and the dissemination of scientific spiritual core in the youth group.

3.The DIMT model with Eastern wisdom

According to the linguist Saussure, every symbol is composed of an energetic and an accusative. The referent refers to the mental activity of the user of the symbol, i.e. the concept that the symbol represents. This is a theoretical division, but in practical communication, energy and reference are like two sides of the same coin, which cannot be separated. Considering the differences between Chinese and Western cultures, Professor Li Siqu of the School of Communication and International Culture of Zhejiang University, based on the research results of advertising symbols in Japanese tea marketing

communication[1], summarized modern Western semiotics and combined with Eastern communication wisdom, created an Eastern semiotics model with local significance --- the DIMT model (Fig.2). Based on the traditional theory of yin and yang, the DIMT model does not particularly focus on the linear combination of "energy" and "reference" of symbols, but more on the integration of the four elements of "words, images, meanings and paths".
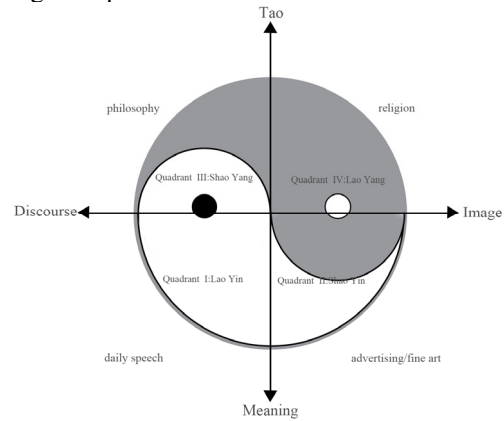

Fig. 2. Watch the national science fiction animation scale

The "DIMT mode" has its unique application value to science fiction animation, which is a comprehensive symbol system of communication with the help of audiovisual symbols, and the mode can explain the symbol system in science fiction animation, provide a theoretical framework for exploring the innovative development of science fiction animation, and provide a practical basis for young people to enhance scientific knowledge, accept scientific concepts and sort out scientific cultural values. It provides a practical basis.

4.Interpreting "Love, Death and Robots" in DIMT mode

4.1. Quadrant I: Symbolic expressions of linguistic collocations and extra-linguistic expressions

Starting from the ideology of language symbols, the "words" in the science fiction animation "Love Dead Machine" mainly use line language and music and sound effects as the carrier of communication symbols, and the play of line language makes the story fuller and richer with beautiful imagination[9]. In "Three Robots", three robots travel in the post-apocalyptic era after the extinction of human beings. The trapezoidal robot roaming in the robot factory speaks: "I come from a luxurious line of baby-sitting robots", while another tall robot replies: "This experiment is suddenly a bit dark, isn't it? " The lines in the animation make people think deeply about the choices they have to make when facing the path of human and their own life and death development. Question 10 of the questionnaire asked about the plot, and as many as half of the respondents chose the option of "lines describing future technology" (Fig.3), which proves that the connection between lines

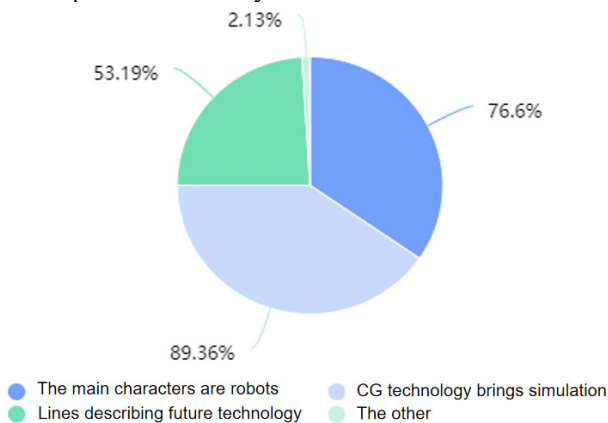and characters in the plot has a driving effect on the development of the story.

Fig. 3. Statistical results of the "Three Robots" storyline survey

The animation "The Work of Zima" explores a more profound question: what is the difference between the meaning of life and the meaning of machines. The purpose of science fiction animation may not be to make the audience feel the convenience of technology or the evil of technology, but to generate deep thoughts about technology and people from the perspective of a "third person" observer.

In the expression of music and sound effects, "words do not exhaust the meaning" and "words do not express the meaning" focus on the limitations of the language of the lines, while music and sound effects can better compensate for the lack of language in the plot performance and convey the psychological activities of the characters. Through the ebb and flow of musical notation, the audience can deepen their understanding of the characters and stimulate their emotions[3]. The side of the play highlights the emotion of Zima's search for his own self to return to simplicity and find the color of "Zima Blue" that belongs to him alone. The rising and falling of the tone, the highs and lows, all contribute to the atmosphere of the play. Sound effects can expand the depth and breadth of the story, through the details of the film to shape the atmosphere, drive the emotions of the crowd. The sound effects of "Love is Dead" are realistic and give people a sense of immersion. The design and production of sound effects injects soul into the picture, and the design of each ambient sound reinforces the sense of presence, outlines the storyline, and allows the audience to feel the atmosphere firsthand.

4.2. Quadrant II: styling design reflects future technology culture

The spirit of the animated image symbol is the most important part that highlights the scientific values of the whole animation. The virtual, abstract and exaggerated nature of the animated image determines that it is a collection of image symbols, which has the function of referring to others beyond the body[4]. The characters in science fiction animation are mostly metal mechs, which can go to the sky and the earth with the support of high technology, but they lose the vision of the real

technology to make life better for human freedom and the value of life. The classic character shapes in science fiction animation are mostly based on mechs, space exploration and other elements. "precisely that machine pulses the trembling jump" in the female astronaut and her partner in the space exploration vehicle, wearing a spacesuit, can achieve communication with Io headquarters, navigation functions, but also through the injection of therapeutic fluid to maintain the body's ability to survive, in the spacesuit and a female image with toughness and faith, Io encountered difficulties and setbacks under the loss of emotions can not be extinguished, only to evoke the emotions within find the goal of finding survival.

The most direct sense of science fiction spectacle is the construction of science fiction scenes. Animated scenes can be detached from reality, and visually stunning sci-fi landscapes establish space for the plot to unfold, serving as a kind of backdrop for the development of the story and achieving cognitive interaction. The questionnaire cites the design of the scene in "It's That Machine Pulse's Churning", a much-discussed online episode of "Love Dead Machine", to conduct the survey. In "Just That Machine Pulsing Thrashing", Io dust rises up like a towering stem and veins, silicon and sulfur elements surround it into branches and leaves, and cosmic elements such as magnetosphere, volcanoes, sulfur ions, molten oceans, tidal heat, and circular orbits are shown one by one in the episode, just as the question 8 in the questionnaire was designed to do. Most people are haunted by the dark surface of the planet and the dreamy light, all of which make people immensely long for the unexplored realm (Fig.4).
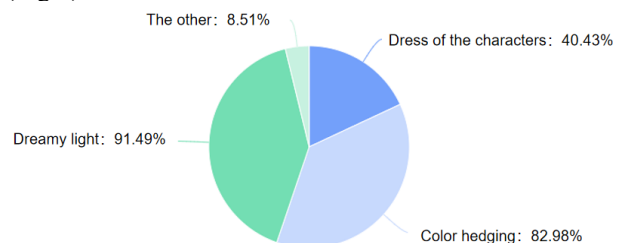

Fig. 4. Watch the national science fiction animation scale

4.3. Quadrant II: styling design reflects future technology culture

The horizontal combination of "speech" and "image" symbols performs a generally discourse-related function, which, in the direction of "horizontal combination", generates the logical meaning conveyed by science fiction animation, which enables the creative team tells the science fiction story through "speech" and "meaning" symbols[7]. In the direction of "vertical aggregation", the symbols in science fiction animation perform a function of meaning production, which can have a direct or indirect impact on the psychology and spirit of the audience[1]. The charm of animation is to use fictional stories to reflect on the values and ethics of things that people know in the real world, so that audiences can find reflections and visions of future values in science fiction

animation based on the same perceptions and different life experiences.

Table 1. Respondent answer text statistics

Number	Submission Time	Answer text
18	2022/12/8 22:29	The kernel of the story, reflecting on the meaning of technology for people
75	2022/12/8 23:53	The exploration of the universe, the human reflection of robots
95	2022/12/10 13:27	Music, the back and forth of the picture
109	2022/12/12 9:27	Worldview setting

In this survey (Table 1), a respondent in "Zima's Work" said that the intention of "Master Zima finally chose to structure himself" in the plot made her reflect on what the meaning of technology is for people; Zima jumped into the pool and the image of a lone boat crossing the sea at the beginning echoed each other, which also increased the respondent's imagination for the future technology. The overall grand narrative and worldview of the future universe inspired the interviewees to think about the humanity of robots.

4.4. Quadrant IV: The expression behind science fiction animation

The fourth quadrant, which is composed of words and the Tao, is close to the philosophical sphere, i.e. to talk about the Tao in rational words[8]. Relying on the specific era and cultural background, science fiction animation looks at the progress of all human beings and their destiny after the change, and conveys thought-provoking ethical thinking and value concepts through "words", "images" and "meanings" as a whole. Through "words", "images" and "meanings", the film conveys thought-provoking ethical reflections and values as a whole.

Many of the episodes of "Love Dead" science fiction animation are about the fate of human survival under various threats of the end of time. The disregard for humanity in the future and the breakage of the ecological cycle caused by the self-imposed and self-righteous rule of mankind provide a model for people to think about the "human-machine relationship" nowadays. In the survey, nearly 60% of the respondents said they would think about the relationship between man and machine in the era of rapid technological development after watching the drama (Fig 5).
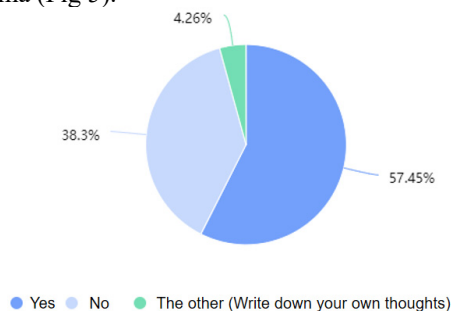

Fig. 5. Consider the human-machine relationship after watching the animation

In an interview with interviewee 49, he stated, "Will humans become more greedy and lustful, and will the arrogance and stupidity in human nature be amplified? Because of greed and desire, humans keep developing more advanced robots in the hope that they will help them get more resources, while the arrogance and stupidity of humans is reflected in the fact that humans feel they are the masters of the earth and think they know everything, or can know everything, and can go about changing the genes of all kinds of creatures, without knowing that they have opened Pandora's Box. The rising of modern technological civilization, mankind pioneered one kind of technology after another, but mankind is completely ignorant of the control of the technology after it is created, will not be in a certain technology will appear to completely change the fate of mankind, so that mankind to destruction."

The narrative of science fiction animation is inseparable from the human sentiment of exploring the unknown. The two episodes are about defiant spirit that humans can show when exploring the unknown by building gorgeous and stunning images, through beautiful wonders, "I am the world I walk in, what I see, what I hear and what I feel comes from myself ." The whole thing may not be what it seems on the surface, and there may be vigorous life under the desolation. The exploration of technological innovation from human destiny to cosmic civilization shows a grand narrative as well as a reflection on real-life issues of great relevance. The expression of animation sublimates the personality of the characters to highlight the spirit of adventure and the sublime realm of human courage. This is a spiritual transmission, but also the return of the true nature of life and human nature.

Although this science fiction animation originates from the field of animation favored by young people, overflowing with the reverie of the future and the sense of science and technology, but each season of animation is constantly making creative innovation, technological innovation and cultural innovation, everywhere through the culture of science and technology and the spirit of exploration and conquest. The symbolic narrative of science fiction animation is inseparable from the sentiment of exploring the unknown that is engraved in the process of human development[6]. The "Tao" is the authenticity of the communication symbols, where the "authenticity" is not objectivity or accuracy in the scientific sense, but whether the connotation of the symbols is in line with the concept of truth, goodness and beauty[4].

5. The development direction of science fiction animation

The symbol system established by science fiction animation integrates scientific values into the thinking of the animation audience in the development of the movement of linguistic and visual symbols, and makes young people feel the scientific values expressed by science fiction animation and its core in the long term interactive communication.

5.1. Narrative: CG and 2D creative spark to build a new space

In this research, we also specifically investigated which one of CG 3D animation or 2D animation could make the interviewed teenagers experience a more immersive technology experience. The survey results found that both kinds of animation have a relative number and their considerable audiences (Fig 6), which shows the richness of the three seasons of "Love, Death& Machine" episodes and its ability to attract a lot of attention and online buzz.
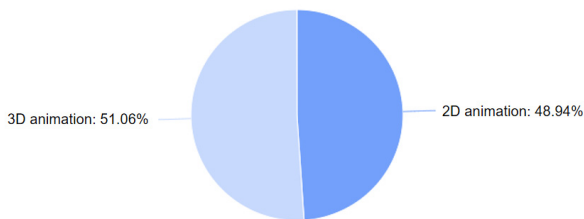

Fig. 6. 3D animation and 2D animation which can bring more immersive technology statistical results

This science fiction animation not only applies to CG, modeling and other virtual reality technology, but also the concept of "virtual" is used throughout all the episodes. Visual and auditory symbols are used to construct a science fiction scene to enhance the storytelling and interest of the narrative. The virtual world is a test of people's imagination, from two-dimensional plane to three-dimensional, not only the difference in the picture, but also the need for text symbols, audio-visual image symbols, etc., to enhance the connection with the real world. Otherwise, the "virtual" and "reality" disconnect, the audience does not identify with the content, then the whole plot will be meaningless. Respondents in the survey also indicated that 3D animation has a more realistic immersion experience (Fig 7), which allows people to perceive the future of technology in the real senses near the sense of presence can bring people into the future through a more realistic, more realistic reflection of the application and use of technology, so that people feel real and thus more believe in its future occurrence and existence.
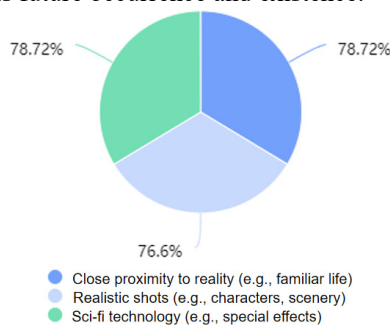

Fig. 7. 3D animation and 2D animation which can bring more immersive technology statistical results

Science fiction animation for the character image character, line design coordination is conducive to the animation orange three-dimensional shape. Let the audience in the macroscopic scene better accept the character, into it, from which to feel the science, the formation of their own scientific concepts and thinking.

The hedge of picture symbols is a major feature for science fiction animation, the strangeness brought by the macroscopic scenes and the scene of fighting with technological weapons and the use of high-tech technology is also one of the pursuits of every science fiction animation fan.

5.2. Aesthetics: "technology + art" to show the ultimate beauty

In terms of the overall effect achieved by the sci-fi animation "Love Dead Machine", it cleverly combines technological texture with artistic aesthetics, showing a unique and extreme beauty. At the end of the survey, the respondents were also asked which elements of "technology" they were most impressed by when watching the episode of "Love Dead Machine", and the word cloud was obtained (Fig 8). It can be seen that "Love Dead Machine" is a perfect attempt to integrate art and science fiction, not only integrating the poetry into the dialogue between human beings and the planet and technological civilization, but also presenting the ethical and value thinking of technology and human future, and the combination of words and images shows the human nature in the vastness of the universe in front of people's eyes.

Fig. 8. Word cloud statistics results for impressive technology elements

On the one hand, the character design and picture elements are an art form, and the animation art shape with technological special effects, mecha machinery, cyberpunk and other elements reveal a strong sense of the future. On the other hand, the penetration of space-time scenes is a metaphor for the intersection of art forms[6].

Many people think that robots can not interpret beautiful images, mecha dress can not interpret pure silence, but when "mechanical" with "tears" will be touching, "mecha" fusion "Blue" will make people feel pure, the use of superimposed symbols often brings a novel experience. This fiction boldly blends technology and art, interpreting a futuristic audio-visual feast, but also for the subsequent aesthetic innovation of science fiction animation to provide reference.

Respondents in the survey also indicated that 2D animation has a higher degree of freedom, thus allowing people to experience different interpretations and thinking under different senses, and can express fantasy imagination, magnificent and magnificent scenes, space and time are not bound and defined by the real world. Without the shackles of having to be visually "real", it is possible to better express the "fantasy" in science fiction.

5.3. Concept: "Tradition + Modernity" Innovation in Interpreting Culture

The topic of keeping the righteousness and innovation is a topic we often talk about, which corresponds to the culture, keeping the righteousness means firmly cultural self-confidence, inheriting the excellent Chinese traditional culture; innovation means advancing with the times, promoting and spreading Chinese culture. In recent years, many local science fiction animations have emerged in China, some of which promote the community of human destiny by playing against alien civilizations, some of which spread human cooperation by restoring the future world, and some of which show the characteristics of uncivilization with cyber elements such as mecha, integrating traditional culture with modern technology and innovatively interpreting Chinese traditional culture and values in a different way. Tradition and modernity are never opposed, but are one and the same. We have to try boldly and use symbols cleverly in order to break through our limitations and achieve righteousness and innovation.

6. Conclusion

Finally, regardless of the character image symbols or painting style, sound and other symbols, the audience is more concerned about the scientific and logical rationality of the animation expression, requiring the creation of science fiction animation in the science fiction expression of "meaning" with "words". The "image" symbol to create. As a unique cultural form, science fiction animation expresses the thinking of reality and imagination of the future. In the age of information technology, science fiction animation promotes the dissemination of national culture, and also forms a certain impact on people's traditional concept. The creation process of science fiction animation cannot simply innovate the image of animation, but also needs to explore the ideas expressed behind the plot and guide people to think about the ethics and values behind it. By using the future scene to map the real-life social problems in order to make science fiction animation with a constant source of vitality. The creators of domestic science and technology animation can only create more popular and enjoyable science fiction works for young people if they keep changing and innovating in the discovery of China's excellent culture and national family sentiment.

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