GameArt Practice: A New Approach to Techno-feminism in China

Yajuan Han

PhD in Arts & Computational Technology, Computing Department

Goldsmiths, University of London

Primary Supervisor: Rachel Falconer

Secondary Supervisor: Professior William Latham

Acknowledgements

In this research journey, I have received help and support from numerous people and organisations. I am very grateful for their help, and I would never have completed this research without them. I would love to express my special appreciation to my supervisors, Rachel Falconer and Professor William Latham, whose expertise, selfless guidance, and faithful belief have been the most important parts of my research journey. Their encouragement, both spiritually and in life, has also allowed me to remain determined and focused when facing challenges, achieving the completion of this study.

I would also like to thank Goldsmths, University of London, Beijing Taikang Space and Nanjing Espoir Gallery for their institutional support for the workshop venues. Special thanks go to Tang Xin, the director of Taikang Space, and Ruan Xiaoyi, the director of Nanjing Espoir Gallery, whose generous support provided numerous resources for conducting workshops. Additionally, I am grateful to the staff of Taikang Space and Liu Mingyang for their dedicated assistance and support throughout conducting the workshops. Moreover, thanks to Holoarts' Zhang Huan and Dang Yongkang for supporting the prototype's development, particularly Yongkang, who provided technical support for the study's VR prototype-building and contributed significantly to this study. Our collaboration and exchange have been a delightful and enriching experience.

I would love to thank my interviewees for their brilliant insights into the hybrid fields of video games and art, which enrich my understanding of the intersection between these disciplines in China, providing a deeper context for this study. Moreover, I am grateful to all the participants who joined the workshops. Their involvement and feedback have furnished this research with valuable first-hand data crucial to the study's success.

My family and friends are the backbone of my determined pursuit of academic research. I am fortunate to have them, especially my mother, Teng Honglan, whose unconditional love, understanding, and encouragement, and my friends Joey Bristol, Liu Lili, Guo Xueting, and Chang

Shenyu for their endless support and encouragement throughout the research process, which allowed me to concentrate on my academic goals.

Looking back on this journey, I see too many people I must thank and struggle with words. I thank all my colleagues, friends and everyone who has provided me with help, support, advice, and feedback. I will forever remember their kindness and assistance. Thank you all for making this journey so meaningful.

Abstract

The intertwining of art and video games can be traced back to artists' pioneering use of computer graphics in their creative works. Within the hybrid space where art and video games meet lies a practice known as GameArt. This practice integrates video game technologies and fine art expression to engage in virtual "world-building." This research examines how an artist-led GameArt practice can provoke women who engage in an interactive prototype and workshops to reflect on gender stereotypes in China. This study aims to facilitate future professionals at the intersection of technology and art to reconsider their perceptions of socially constructed gender roles.

Using a mixed methods approach, this practice-based research spans game design, immersive technology, and expanded art practices. The theoretical frameworks of new materialism and techno-feminism guide this research and analysis. By conducting workshops of immersive GameArt experiences the study creates the space for women to discuss and examine traditional female roles and societal gender expectations in China. Key findings of this case study indicate that the use of GameArt as a practice holds the potential to influence participants' perceptions of traditional gender roles in China.

This study contributes to the fields of digital art and time-based media by creating, relocating, and applying the practice of GameArt. It also introduces new insights into the relative absence of rigorous academic scaffolding and terminology around the GameArt practice itself. The research is positioned to promote women's engagement with the creative technology sector and explore the adoption of techno-feminist principles in artistic practices in China.

The research findings' limitations include the study's embedding within artistic practice and reliance on a specific group of participants with narrow demographics. Applying this study's findings to a broader context has limitations due to the specific scope of the design of the GameArt practice.

Table of Contents

List of Abbreviations

AI: Artificial intelligence

CNKI: National Knowledge Infrastructure

CJH: Cyber JiangHu

EEG: Electroencephalography

EV: Empire Valley Company

FTGames: Female-targeted Games

GPU: Graphics Processing Unit

GREP: Golden Rule Embodiment Paradigm

IVEs: Immersive Virtual Environments

LGBTQ: Lesbian, ay, Bisexual, Transgender, Queer or Questioning

LFP: Low-fidelity Prototype

MMOGs: Massively Multiplayer Online Games

NPC: Non-Player Character

NR1: Narrator’s role 1

NR2: Narrator’s role 2

NR3: Narrator’s role 3

PI: Place Illusion

Psi: Plausibility

PUA: Pick-up Artists

PUBG: Player Unknown’s Battlegrounds

Q&A: Questions and Answers

RHI: Rubber Hand Illusion

SDKs: Software Development Kits

SMEs: Medium-sized enterprises

VR: Virtual Reality

1PP: First-person Perspective

3PP: Third-person Perspective

Chapter 1: Introduction

1.1 Personal Motivations and Artistic Journey

Genesis

My research at the intersection of GameArt and techno-feminism originated from my extensive engagement as a "whale" (heavy spender) in a couple of Chinese female-targeted games (FTGames)[1] [56], [89]. The 2017 release of the video game "Mr Love: Queen's Choice" significantly boosted the popularity of the game genre of FTGames in China[2], leading to a series of intense online and offline social phenomena of Chinese women dating "paper husbands" (virtual male characters from the game)[3] [130]. Reflecting on my engagement with FTGames, I initially approached them purely as a form of entertainment, unconcerned with their underlying worldviews and narrative styles. However, to my surprise, I found myself significantly invested—financially and in terms of time—over six months. As media reports about extreme behaviours by female gamers from FTGames grew more frequent, I began to introspect my own actions and the broader societal phenomena about FTGames. On the one hand, I grew increasingly aware of the negative impacts that the design and content of FTGames have on the thoughts and behaviours of female players. On the other hand, realising the impact that video games can have on women also sparked my significant interest in exploring how video games, as a powerful medium, could be utilised for more meaningful creative expression. Although some scholars argue that the rapid rise of FTGames reflects a growing feminist awareness in the gaming field, I align more with other studies indicating that FTGames are essentially products of the "Sheconomy" [47], [55], [64], [90], and require

[1] The research proposes the term female-targeted game (FTGame) as the English translation of a Chinese female video game, distinguishing it from the concepts of general female games and Japanese female games (see 2.1.2.4 for more details).
[2] Within just a month of its launch, "Mr Love: Queen's Choice" achieved 7.113 million installs, with female players accounting for over 94.2%, and generated a monthly revenue of 300 million RMB [56]. "Mr Love", Tencent' s romantic dress-up game Yun Shang Yu Yi and NetEase's ancient romance game Love Is Justice created over 43 billion RMB in revenue in 2018 [89].
[3] Mr Love: Queen's Choice triggered a series of female fans' crazy actions; for example, female gamers considered themselves wives of these in-game main male characters. To indicate their love, activities such as renting LED screens in major cities' landmarks scroll playing romantic messages, purchasing land on the moon, buying a planet and naming it after their paper husbands, sharing "personal stories" about their "paper husbands" with other wives, gathering and investigating "traces" of their paper husbands are common occurrences.

substantial financial expenditure for game players to maintain the illusion of pleasure and "empowerment." FTGames are designed to reinforce socially stereotyped male values that shape women's imagery and behavioural standards[4]. The impact of these video games on Chinese women's social roles and self-perception goes far beyond mere entertainment. In essence, these games play a crucial role in the idea of rediscovering femininity through consumption [38].

Regarding my art journey, my interest in the dynamic relationship between women's perceptions and their systematic environment has always driven my artistic exploration through various media. From my early focus on the consumer cultural environment that shapes women's perceptions to the inner environments associated with women's childhood and growth, my interest in how future technologies and virtual spaces might impact women's perceptions began about ten years ago. At that time, my artistic creations primarily utilised traditional media like painting and video because I lacked the ability to employ video game technology or virtual reality (VR). Thus, compared to my current projects using interactive virtual technologies, my earlier works are more about envisioning the effects of future technologies through artistic interpretation or using technologies as a context rather than experiencing and analysing these impacts through direct technological engagement. Things changed when I created my first VR interactive work in 2018, which involved deeply engaging with video game and VR technology. This engagement allowed me to experience the profound intersection of aesthetic expression with these technologies, sparking a significant fascination with GameArt as a spatial, nonlinear medium. The interactive nature of GameArt also attracted me. Unlike traditional media, which often conclude once a piece is completed, GameArt continually evolves and is reshaped through audience participation. Since then, GameArt has become an ideal and powerful medium for me to build worlds and engage participants in exploring and experimenting with speculative ideas, thereby making and re-making knowledge collaboratively.

[4] The narrative of Female-targeted games typically falls into two categories: one involves women interacting with idealised male characters, such as in dating scenarios, while the other encourages women to experience male worlds, such as becoming a queen who accumulates territories and male consorts.

Moreover, techno-feminist and new materialist theories have profoundly influenced me in various ways. My introduction to techno-feminist theories began with Donna Haraway's A Cyborg Manifesto [8], which offered a unique perspective on how modern technology shapes our social identities and cultural practices. Haraway's work prompted me to reflect on the relationships between technology, gender, and subjectivity. Also, her concept of "situated knowledge" highlights that knowledge and understanding are contextually based and shaped by specific social and cultural positions [7], which also significantly influences my perspective of observation and practice approach. Judy Wajcman is another theorist I appreciate. Her theory on the mutual shaping of gender and technology, underscoring the importance of women's involvement in technology design, development, and innovation [6], inspires me to engage in promoting increased female participation to alter gender dynamics in technologically driven societies. These techno-feminist insights made me realise that in using GameArt practice, as an artist, I have the responsibility and the ability to incorporate gender awareness into my creations, encouraging audiences to reflect on the relationship between gender and technology. Moreover, Karen Barad's new materialist theories, particularly her emphasis on the dynamic co-creation of reality through material-discursive practices [136], [150], have deepened my understanding of how video game technology and women shape each other. Barad suggests that reality is continually constructed through the interactions of material and discourse. This paradigm has revolutionised my approach to using game technology in artistic creation, not merely as a tool but as an active medium that constantly co-constructs reality through "intra-actions"[5] [136, p.141] with participants and other materials.

Connecting Personal Journeys with Academic Exploration

My artistic journey, reflections on Chinese FTGames, and the influences of techno-feminist and new materialist theories on my thinking and creative practice have directed my focus towards exploring the application of techno-feminist principles in the GameArt practice to challenge gender

[5] Intra-action is a concept introduced by Karen Barad to replace "interaction" [137]. It reveals the necessity of pre-established bodies' participation in action with each other. The agency is regarded as a "dynamism of forces" [136, p.141] in which all designated "things" are continually exchanging and diffracting, impacting, and operating inseparably instead of an inherent property of an individual or human to be exercised [136], [137]. Intra-action acknowledges pre-existing separate entities and highlights the interconnectedness and inseparability of "things" in the ongoing dynamics of becoming [136], [137].

stereotypes in China. This exploration culminated in my practice-based research: GameArt Practice: A New Approach to Techno-feminism in China. The research aims not only to facilitate reflective dialogues of socially constructed gender roles among future professionals at the intersection of technology and art but also to promote the active participation of Chinese women in the creative technological sector by demonstrating the transformative potential of collaborations between video games and art that embody gender awareness.

First, my critical reflections on the gender roles and consumer culture in Chinese FTGames have motivated me to investigate how an artist-led GameArt practice can challenge existing societal gender stereotypes in China. This exploration extends beyond theoretical research and is implemented and evaluated by creating a VR GameArt prototype informed by techno-feminist principles and organising workshops. Specifically, I incorporate the critical perspective of techno-feminism into the design and interactive experience of the prototype. Using game mechanics and narratives, I encourage participants to reflect on and challenge societal expectations surrounding women's gender roles in China. This approach allows participants to directly experience and critically examine the portrayal and impact of gender stereotypes in GameArt interactions. On the other hand, by employing workshops in art institutions as a practice, I aim to create a collaborative space for Chinese women who may work at the intersection of technology and art in the future. This way initiative promotes open dialogue and fosters learning about GameArt methods, ultimately facilitating more Chinese women to engage in the design and development of technology.

Second, the techno-feminist principles and perspectives applied in my research initially stemmed from the theories of Donna Haraway and Judy Wajcman. However, as the research progressed, I integrated these theories into my cultural context’s specific constraints and challenges. Likewise, my referencing point of techno-feminist GameArt practice started from the practices of European and American feminist creators working at the intersection of video games and art. Their practice provided not only case studies and method references but also reinforced my confidence in using techno-feminist GameArt practices to explore gender stereotypes in Chinese society. However, given the different social and cultural contexts and challenges compared to those in Europe and

America, I tailored my practice to suit the Chinese socio-cultural environment better, thereby developing a “situated practice” relevant to my experience and background. Moreover, during my research process, I engaged in continuous self-reflection and documented extensively through photos and videos. This approach not only acknowledges the “situated” nature of my research but also responds to Haraway’s call for researchers to pursue paths that are more responsible and socially responsive. By providing comprehensive documentation related to the process and environment of my research practice, I aim to present the conditions and scenarios of my research more transparently and accessible.

Third, new materialist theory, particularly Barad’s emphasis on posthuman performativity [149], [150], her revelations about “intra-action” [136], and the entanglement between subjects and objects [136], have provided new perspectives and methods for my research. In my study, game technology is not just a tool but also a material that co-creates reality alongside discursive practices. Also, by emphasising participation in the research process, I aim to actively engage participants in shaping and reshaping discourses of reality rather than them merely being observed. Additionally, I employ a mixed-methods approach, which facilitates deep interactions between game technology, participants, and my practice, enabling knowledge-making. The mixed methods I adopted in this study include qualitative research (creating the artwork/prototype and interviews) and participatory methods (workshops, low-fidelity prototype making, and group discussions). Moreover, the study is also conducted under an autoethnographic framework, which allows me to closely link my personal practices and experiences with broader socio-cultural dynamics and engage in critical self-reflection at various stages of the research, thereby enhancing the theoretical depth and practical significance of the study.

Overall, my practice-based research is driven by profound personal motivations and the evolution of my artistic practice. These elements are not only reflected in the selection of research themes but also influence the specific methods and pathways I employ. Specifically, my early artistic endeavours mainly involved painting and video installations, such as the paintings in the Bling

Bling series[6], which established a visual aesthetic influenced by video games and anime, profoundly impacted my later artistic style. In my video work, The Nth Power of One[7], and the Transcendence painting series[8], I deconstructed the canvas/frame to create an illusion of multi-dimensional spatial narratives. This exploration of space for storytelling, limited by the confines of painting and video, directly led to my interest in VR as a spatial medium. Similarly, the randomness of narratives between the dynamic environments and the individual in the video installation (“Hello Human!”)[9] significantly fueled my interest in participation and interactivity. My early works and practices have been showcased in a series of exhibition projects[10] and documented in public literature and books[11].

---

[6] The Bling Bling series (2005-2010) explores the impact of consumer culture on Chinese women's perceptions during China's social and economic transformation. This series predominantly features paintings and includes some sculptures and video installations. Stylistically, these works are influenced by video games and anime. Swarovski crystals and glitter are frequently adorned on paintings and sculptures to create a visually intense materialist experience. Initially, the paintings offer a close-up view of the artist's observations on her life and her peer group, which later transitions to a bird's-eye view, providing a third-person perspective for the viewer to observe the cultural environment depicted.

[7] The Nth Power of One (2001) employs an aerial perspective to capture the movement of performers on a floor covered with white paper, who leave ink trails with their ink-stained feet. The video comprises ten scenes, starting with a single performer and incrementally adding one per scene until the tenth scene, which features "N" performers. As the number of performers grows, the vast white paper gradually turns black. From a bird's eye view, the performers appear as abstract black dots. This work explores the dynamic relationship between individuals and the collective within the grand cosmological themes of creation ex nihilo and eternal recurrence.

[8] The Transcendence series (2010-2013) is a continuation of the bird's-eye view established in the later works of the Bling Bling series. It evolved into exploring Chinese women and their societal and life environments from a higher and multiple spatiotemporal dimension during China's social and economic transformation.Consisting mainly of paintings and a few video installations, the series juxtaposes narratives from different times and spaces or disrupts the temporality of video narratives in physical space, offering a more detached, overarching observational perspective.

[9] (Hello Human!") (2022) is a video installation created for the public art project Art Takes Over. The work features 3D animations displayed on large LED screens at two locations in downtown Shanghai. These animations appear as "portals" on the screens, creating “interfaces” for dialogue between citizens and "Others" from a futurist time-space. The content of the animations narrates the formation and evolution of a speculative synthetic universe, with two segments that are causally linked yet temporally reversible. This piece explores the randomness of individual narratives shaped by spatial and temporal structures.

[10] See: Personal website: www.hanyajuan.org

[11] See: Tate Research center: Women Artists in Contemporary China, by Monica Merlin, 2018: https://www.tate.org.uk/research/research-centres/tate-research-centre-asia/women-artists-contemporary-china/han-yajuan

The Art of Women in Contemporary China: Both Sides Now, by Patricia Eichenbaum Karetzky and Zhang Er, Cambridge Scholars Publishing, 2020: https://cambridgescholars.com/product/978-1-5275-4102-3#tabs-2

ASIA ART ARCHIVE: https://aaa.org.hk/en/collections/search/search/actors-id:13509/page/2

However, as my exploration of the dynamic relationship between women's perceptions and their systematic environment deepened, I realised that while paintings and videos possessed rich, expressive potential, they were limited in simulating dynamic systems and facilitating interaction. This realisation led me to seek more immersive and interactive approaches. The shift to VR and GameArt enabled me to create dynamic spatial systems where participants could interactively engage with the speculative world in my works. This transition in media made the participants co-creators of knowledge-making, not only broadening the scope of my art practice but also deepening my understanding of the complex relationship between women and technology. By deeply understanding and applying techno-feminist and new materialist theories within my cultural context, this study examines how an artist-led GameArt practice can provoke women who engage in an interactive prototype and workshops to reflect on gender stereotypes in China. As this thesis unfolds, I aim for this work to showcase the transformative potential of combining GameArt with techno-feminist principles to influence participants' perceptions of traditional gender roles in China. Additionally, I hope to draw more attention to the active role that women can play in the creative technological sector.

1.2 Research Background

As the ongoing fusion of video games and art continues [1], GameArt practice, which integrates video game technologies and fine art expression to engage in virtual world-building, has emerged in the hybrid field of video games and art. GameArt practice as a performative[12] activity, in which creators, participants, and various materials collaboratively conduct world-building and shape knowledge. These materials include a broad range of materials [134], such as no-human entities, video game technologies, and various potential supplementary technologies like Virtual Reality (VR) and Artificial intelligence (AI) (will be further addressed in 3.1). Compared with the previous

[12] The concept of performativity in the new materialism framework refers to transcending mere action to embody the entanglement of matter and meaning. Judith Butler introduces performativity in gender construction [288]. Karen Barad's humanist performativity integrates quantum physics, highlighting the inseparability of observer and observed and the dynamic co-creation of reality via material-discursive practices [136].

game art practices in the intersection of video games and art, GameArt practice has presented new methods for artists to employ video game technologies and design elements and embody a new relationship between video games and art. Many artists have used the practice of employing GameArt to challenge gender bias and promote female visibility in the gaming industry and beyond, for example, Angela Washko[13], Anna Anthropy[14], Danielle Brathwaite-Shirley[15], and Lena NW[16]. However, employing GameArt practice to challenge gender stereotypes remains largely unexplored by artists in China. This situation is primarily due to the negative repercussions associated with the development of feminism in China [518] and the relative lag in developing practices in the hybrid area of video games and art [23]. Therefore, this study examines how an artist-led GameArt practice can provoke women engaged in an interactive prototype and workshops to reflect on gender stereotypes in China. It aims to facilitate reflective dialogues of socially constructed gender roles among future professionals at the intersection of technology and art by demonstrating the transformative potential of collaborations between video games and art that embody gender awareness. Ultimately, the research seeks to promote active engagement of Chinese women in the creative technological sector.

The Entanglement of Video Games and Art

The entanglement of video games and art can be traced back to the early stages of the development of computer graphics [1]. Artists have employed various computer technologies since the 1960s [1]-[4]. Then, in the late 20th century, video game technology became more accessible for artists because of personal computers' availability and third-party game commercialisation. Today, the threshold of video game technology has been lowered significantly, and many creators from various domains employ video game technology in their creative practices. Especially for

[13]Angela Washko (b. 1986), an American artist and writer, focuses on fostering feminist discussions in hostile spaces with notable works like The Game: The Game (2018) [157].
[14]Anna Anthropy (b. 1980), an American game developer and author, advocates for games as culturally valuable, with works like Dys4ia, exploring gender politics and identity [161]-[164].
[15] Danielle Brathwaite-Shirley (b. 1995), an animator/artist, focuses on documenting black trans lives through animation, sound, performance, and video games, creating participatory works like Black Trans Archive.
[16]Lena NW is an animator, illustrator, rapper, and game developer [168]. She focuses on themes like identity, feminism, and technology. Notable work: Nightmare Temptation Academy (2012) [168]-[170].

artists in digital art and time-based media, their GameArt practice has displayed a hybrid relationship between video games and art because of artists' profound knowledge and innovative methods of employing video game technology and design elements in their art practice. Consequently, the hybrid field of video games and art become an excellent experimentation ground for creators; meanwhile, creators' diverse knowledge and backgrounds have introduced "hybrid genes" into GameArt practices. However, a gap remains between the widespread practical application of GameArt as practice and the relative absence of rigorous academic scaffolding and terminology around the practice itself, especially from a non-dualistic perspective drawn on new materialism.

Techno-feminism, Video Games and Art

Feminist theories of technology critically examine the relationships between technology and gender, with the central argument switching from challenging the traditional association of technology with masculinity to critiquing the gendering of technology itself over the past 30 years [6]. Feminist scholars, such as Sadie Plant and Donna Haraway, have moved beyond binary gender perspectives; their theories emphasise the fluid relationship between gender and technology and highlight technology's potential as a powerful tool to enhance women's capabilities [5], [7]-[9]. In 2004, Judy Wajcman proposed "technofeminism" [5], indicating technology and gender influence each other within specific sociocultural contexts [516]. Her theories reveal the importance of women's involvement in technology design, development, and innovation processes to achieve gender equality [6]. She advocates promoting more women in technology design to reshape gender power dynamics in a technologically driven society [6].

Regarding feminist theories in video game studies, Brenda Laurel, Janet Murray, and Sherry Turkle's work provides the groundwork for early research in this area [10]. Then, the focus of research on feminist theories in gaming has shifted from viewing video games as tools to promote women's confidence and skills in new technologies to encouraging and supporting females in computer programming [10], [11]. However, research on females and gaming from the late 20th to the early 21st century has primarily focused on discussing unique gaming modes and preferences among women [12]. This situation has been improved by many studies in the past decade [13]-

[19]; for example, some explore gender inclusivity in gaming culture[14], and some investigate the impact of all-female game jams on gaming industry diversity [17]. Meanwhile, many feminist theorists have also concentrated on the relationship between art, feminism, and technology. For example, Judith Brodsky explores how female digital artists incorporate feminist ideas into visual culture [20], [21]. Jennifer Way examines digital art's engagement with techno-feminism and technology's impacts [22].

Artists and feminist theorists' responses to male dominance in gaming have opened new directions in game studies [21]. With the prevalent integration of video games and art, techno-feminism principles have been embodied in many creators' GameArt practices in the hybrid area of video games and art to challenge male-centric narratives in the gaming industry and beyond. For example, Angela Washko and Anna Anthrop's practices provide novel ways to discuss and present gender issues within digital culture [157], [162]. However, till recently, employing GameArt practice to challenge gender stereotypes remains largely unexplored by artists in China, espicially from a techno-feminist perceptive.

Techno-feminism, Video Games and Art in China

In China, the engagement between the adoption of techno-feminist principles and the GameArt practice is still significantly limited. This situation is not solely due to the novelty of applying techno-feminist theories or perspectives in creative practice in the intersection of video games and art but also reflects broader challenges, including cultural perceptions of feminism, the unique characteristics of China's gaming industry, and the longstanding gap between the video games and art, such as technical thresholds and the typically starkly contrasting public's perceptions of these two mediums, leading to a slow process of creative practices that integrates video games and art.

First, feminism, as a "travelling theory" in China [25]-[29], its development and application in China has elevated women's self-reliance and societal engagement with gender issues but also introduced challenges, including exacerbating gender divides and influencing young women's values through its commercialisation and radical expressions [518]. However, some radical

feminists in China adhere to an extreme feminist stance, making them irreconcilably opposed to men [518], which leads to a misconception of feminists as anti-men in public [67], [517], [518]. Moreover, the concept of feminism has also sometimes become a label used as a tool for commercial success, such as attracting internet traffic in China [67], [92], [517]. This damaging misunderstanding leads to low societal tolerance for feminists generally, prompting Chinese women to distance themselves from the feminist identity to avoid negative impacts on their lives and careers.

Regarding techno-feminism, the application of employing its principles in study or practice to explore the interplay of gender, technology, and society is still developing in China. In English literature, numerous studies have explored feminist theory in gender and technology in various aspects of China [35]-[38], [41]-[44], such as fashion culture [36], shopping festivals [38], and the beauty economy [43]. These studies provide diverse perspectives for understanding the dynamic interactions of females and technology in China. A few scholars have specifically employed Wajcman's techno-feminist theories to analyse and reveal how the development of beauty apps and the addition of "beauty filters" in facial scanning on Alipay control and impact Chinese women's bodies [34] [515]. These studies offer insights into investigating gender bias and technologies in China by adopting a techno-feminist lens. Meanwhile, in Chinese literature[17], while there is a significant amount of research related to female, gender, and technology, studies related to "more recent techno-feminist theories", as indicated by Wajcman [6] are primarily focused on introducing Wajcman's techno-feminist theory [509]-[513]. Overall, the exploration of gender and technology issues within the Chinese socio-cultural context through a techno-feminist lens is still developing. Studies that use "more recent techno-feminist theories" [6] as an analysis tool or theoretical framework to guide research practice are still scarce in Chinese literature, and the adoption of techno-feminist principles in artistic practice is largely underexplored.

Second, the video game and its industry have unique characteristics in China. Video games have been regarded as a cultural vehicle in China [70], [71]. Its technology bears the mission of national

[17] According to the data on National Knowledge Infrastructure (CNKI), established in 1999, China's most crucial research and information publishing institution [491].

technological revival [72]-[75]. Currently, gaming is a massive industry in China with a significant player base and market [76]-[79], [99] [125]. While video games' development reflects national pride and is guided and supported by the state [70], [80]-[85], it is also subject to strict regulations [82]-[84], [86]-[88]. Top video game companies monopolise the gaming industry, leaving a narrow space for developing small and medium-sized enterprises (SMEs) and indie game developers that generally focus on creativity and innovation. FTGames [56], [89] are generally aimed at stimulating women to consume. Their contents usually promote patriarchal and consumerist values, with FTGames' design, contents, and worldview largely governed by capital and male dominance [47], [55], [64], [90]. FTGames have played a supportive role in rediscovering femininity via consumption [38]. Further, female game developers often maintain a distance from being labelled as feminists [66], [67], [69], [91], [92], and some developers believe feminist topics are taboo themes in video game design because it is likely to fail the game license approval process [67]. These above situations lead to the result that, in the short term, the gaming industry does not provide an ideal context for conducting GameArt practice that adopts techno-feminist principles to challenge gender bias.

Third, in the art field, although there are instances of artists using video game technology and design elements for art practices, the significant professional thresholds between video games and art in China, along with the public's divided stereotypical perceptions of video games and art, create gaps between these two domains [23], [24]. The professional thresholds, stemming from distinct educational paths in art and computing from high school, create barriers to interdisciplinary GameArt practice in China due to differing training and mindsets. On the other hand, video games are often associated with lowbrow culture and are under strict control by the state [86]-[88]. It generally has negative media portrayals, for example, it has being labelled as "spiritual opium" and having a harmful influence on youth development [208]. Conversely, art is seen as a "noble" realm and linked to national prosperity and cultural development [209], [210]. Despite some scholars advocating for video games as an art form in China [212], video games are still viewed distinctly from art by the public. Consequently, GameArt practice remains a relatively novel concept for many artists, posing challenges in understanding and application. Moreover, artists often shy away from aligning closely with feminist positions due to pervasive negative perceptions of feminism. Not

only is GameArt practice relatively scarce in China, but GameArt practices that employ or embody techno-feminist perspectives or principles are even rarer.

Current Opportunities

However, opportunities for techno-feminist GameArt practice in China are gradually emerging. First, China has a massive female player base of up to 300 million (2019) [93] [94], which may increase females' acceptance of GameArt as a practice. Second, the public's attitude towards video games has taken an optimistic turn because the younger generation who grew up with video games tends to have a more positive attitude towards video games[66], [67], [91], [95]. This shift may help to reduce the stereotypical attitude toward video games and creative practice related to video games. Third, since the government has recognised video games' cultural, technological, and economic values, numerous policies have been related [72]-[75], [96]-[101] to prompt more educational institutions to offer video game-related majors or to employ video game technology to cultivate student skills. Some art colleges have even established dedicated video game departments [102], creating conditions for nurturing students and future professionals to engage with GameArt practice. Fourth, the widespread adoption of game technology and the development of gaming communities and culture have facilitated learning and the usage of game technology, lowering technical thresholds [23], [24]. Fifth, the art field in China remains relatively open and inclusive in terms of critical creative practice compared to the gaming industry, which may offer better environments for exploring GameArt practices that are informed by techno-feminist principles. Despite various challenges, current opportunities may pave the way for exploring GameArt practices informed by techno-feminist principles in China.

1.3 Importance of This Study

This study is important for several reasons. First, there have been many creators employ GameArt as a practice within the hybrid field of video games and art, engaging in virtual world-building to explore speculative ideas. Current these GameArt practices embodies novel methods of artists utilising video game technologies and design elements compared with previous game art in the

intersection of video games and art, which fosters a new relationship between video games and art. However, despite the widespread practical application of GameArt as practice, there is a relative lack of rigorous academic scaffolding and terminology surrounding GameArt practice, particularly from a non-dualistic perspective influenced by new materialism. This study may bridge the gap between GameArt's broad practical application and the relative absence of comprehensive academic analysis.

Second, the study's importance lies in its focus on a relatively unexplored area in China—applying techno-feminist principles to artist-led creative practices in the hybrid area of video games and art. By exploring the artist-led GameArt practice guided by technofemnist principles, this research may establish a case study in China that not only facilitates women engaged in the interactive GameArt prototype and workshops to reflect on gender stereotypes but also brings a critical understanding of the interplay between women and the intersection of video game and art. The rarity of such studies in China adds to this research's novelty and potential impact.

Third, despite the improved social status of women in China, digital technology and consumerism have further exacerbated patriarchal ideologies [38]. As Wajcman's theories revealed, it is essential for women to get involved in technology design, development, and innovation processes to reshape gender power dynamics in a technologically driven society to achieve gender equality [6]. The research's target group is future professionals at the intersection of technology and art—a crucial area where gender disparities are prominent. By encouraging these professionals to reconsider and critically engage with socially constructed gender roles, the study supports broader efforts to promote active engagement of Chinese women in the creative technological sector.

Fourth, as a powerful medium, video games in China profoundly influence the vast community of female gamers, extending beyond mere entertainment to shape ideological and behavioural aspects [18], [19]. FTGames, as products of the "Sheconomy," cater to women's consumer interests, crafting illusory fantasies that perpetuate patriarchal and consumerist values [47], [55], [64], [90], contributing to the idea of rediscovering femininity via consumerism [38]. This study emphasises using GameArt to express women's experiences in China. This approach may provide

women with the tools and platforms to express their experiences and perspectives and challenge traditional narratives in video games.

1.4 Research Questions, Objectives, and Goals

The main research question:

How can an artist-led GameArt practice informed by techno-feminist principles provoke its women participants to reflect on gender stereotypes in China? The main research question unfolds through four lines of inquiry. They are:

Sub-question 1: What is GameArt practice?

Sub-question 2: In which context could an artist-led GameArt practice informed by techno-feminist principles be effectively conducted in China?

Sub-question 3: Can this study's VR GameArt prototype, employing a female-focused narrative and the "mirror apparatus" [19] as design strategies, facilitate reflection among participants on gender stereotypes in China?

Sub-question 4: What is the potential of an artist-led GameArt practice informed by techno-feminist principles in China?

This study utilises an artist-led GameArt practice informed by techno-feminist principles to examine and challenge prevailing gender stereotypes in China critically. It aims to facilitate reflective

[19] The term "mirror apparatus" draws inspiration from film studies' Apparatus Theory, which conceptualises the 2D film screen as a mirror, engaging the audience through film language to project themselves, thus influencing their perception [301]-[304]. In this study, "mirror apparatus" refers to a design strategy in this research's VR GameArt prototype that regards interactive Immersive Virtual Environments (IVEs) as "mirrors" to create "mirror reflections." (further addressed in Section 3.4)

dialogues of socially constructed gender roles among future professionals at the intersection of technology and art by demonstrating the transformative potential of collaborations between video games and art that embody gender awareness. Ultimately, the research seeks to promote active engagement of Chinese women in the creative technological sector.

The specific goals of this study:

The first specific goal of this study is to relocate GameArt practice within a non-dualistic framework informed by new materialism. The second specific goal is to investigate the potential of art fields to effectively conduct an artist-led techno-feminit GameArt practice. The third specific goal is to examine the effectiveness of vital components of this research—a VR GameArt prototype and workshops in art institutions—to provoke women engaged in these activities to reflect on gender stereotypes in China.

1.5 Definition of Terms

GameArt practice:

GameArt practice emerges in the hybrid field of video games and art. It refers to the creative practice that integrates video game technologies and fine art expressions to engage in virtual world-building. As a form of "worlding" activity, GameArt practice embodies performative characteristics throughout its process, wherein creators and participants, along with various materials, collaboratively engage in world-building and knowledge making. Moreover, these materials in the process include, but are not limited to, video game technologies, non-human entities, concepts, emotions, and various other tangible and intangible materials, all contributing to the continuous making and remaking of knowledge.

GameArt:

GameArt refers to an artefact developed and supported primarily by video game technologies. It often manifests as an interactive virtual digital world, integrating knowledge and elements from video games, art, and other disciplines. GameArt is a crucial component of GameArt practice,

serving as a medium for interactions among creators, participants, and materials. In this study, the term GameArt is also used to categorise these artefacts.

GameArt Apparatus:

GameArt Apparatus refers to the dynamic environment where GameArt practices are conducted and developed, encompassing a broad spectrum of physical and conceptual factors. This environment includes but is not limited to, the technical means and materials used in creating GameArt, the contexts for conducting GameArt practices and displaying GameArt, the creators' knowledge and identities, and the cultural and societal narratives that influence conducting GameArt practices.

Creator:

The term "creator" refers to individuals engaged in GameArt practice. Creators in this field typically possess diverse identities and interdisciplinary knowledge. Many are artists from the art field or game developers from the gaming industry. However, they may also be practitioners in both areas or possess knowledge and backgrounds in other fields, such as architecture, film, music, and more.

game art:

This study uses the term "game art" to refer to other creative practices in the hybrid area of video games and art. Numerous scholars have previously defined these practices, each with specific scopes confined to particular historical and technological phases. Therefore, this paper employs "game art" to refer to those previous practice and facilitate the distinction between them and GameArt practice as focused on in this study.

Techno-feminist theories:

In this study, references to techno-feminist theories primarily pertain to more recent theories by Donna Haraway and Judy Wajcman, rather than a broader interpretation of feminist theories in technology. Particularly, Judy Wajcman’s concepts of how technology and gender influence each other within specific sociocultural contexts [516], and the emphasis on the role of women in

technology design to reshape gender power dynamics in a technologically driven society [6], have significantly guided the design of this research.

Material:

In this paper, "Material" refers to the broad interpretation of matter in new materialism theories. It encompasses human bodies, non-living organisms, tangible objects, spaces and places, along with their natural and architectural environments, and even material forces such as gravity and time, as well as abstract concepts, human constructs, imagination, memory, and thought [134].

Worlding:

The term of “worlding” in this paper mainly draws on Karen Barad’s theories of posthumanist performativity [149], [150], highlighting the dynamic co-creation of reality via material-discursive practices [136], [150]. “Worlding” implies that the world is continually reshaped through relationships and “intra-actions” [136, p.141], extending beyond the human sphere [133], [136]. “Worlding” aslo serves as a medium to disrupt usual temporal flows and modes of existence, thereby facilitating an exploration of the intertwinement between humans and non-humans [141].

Game:

Unless specifically stated otherwise, references to “game” in this paper generally mean video games, such as when mentioning game players and GameArt practice, it refers to video games.

Video game language:

In this study, video game language generally refers to the unique set of conventions, symbols, and mechanics used to communicate within video games, including visual languages, audio cues and musics, interfaces and controls, narrative techniques, and game mechanics.

1.6 Scope and Limitations of the Study

This study is situated at the intersection of art and video games and aims to contribute to digital art and time-based media. It employs GameArt as a practical medium to case study an artist-led techno-feminist GameArt practice in China. The primary components of this case study—a GameArt prototype and related workshops—are conducted in art institutions to assess their effectiveness in prompting critical reflection on gender stereotypes among participants. This practice-based research is guided by techno-feminist and new materialism theories, particularly those from Donna Haraway, Judy Wajcman, and Karen Barad, ensuring a deep integration of theory and practice. Employing mixed methods allows the researcher to bridge personal GameArt practices with broader societal contexts and approaches to the research aim of facilitating reflective dialogues of socially constructed gender roles among future professionals at the intersection of technology and art, and ultimately, seeks to promote active engagement of Chinese women in the creative technological sector.

In analysing and repositioning the concept of GameArt practice, the study highlights the hybrid relationship between video games and art from a non-dualistic perspective. However, due to limitations imposed by the researcher's knowledge and background as an artist, this paper predominantly addresses GameArt practice from an art perspective. Additionally, the analysis primarily draws on cases from the art field. This study acknowledges the potential oversight of relevant examples and interpretations from the video game field.

During the process of conducting this study’s art-led GameArt practice, the researcher’s artist identity and art institutions play a crucial role in addressing the primary inquiry of this study, which is a strategy adopted in the specific cultural context of China rather than suggesting that GameArt practice is subordinate to the art field.

The main limitations of this study include several aspects that could potentially affect the generalisability and application of the research findings. The interpretive framework primarily draws from the art domain, which may require adjustments when applied to non-artistic fields. The study

predominantly engages Chinese women who are already somewhat familiar with the domains of art, video games, and feminism. This selection bias could limit the generality of the findings. Furthermore, the use of advanced technologies like VR in the prototype may restrict participation to individuals comfortable with such tools, potentially skewing the user experience and research outcomes. As this study is conducted within the specific cultural and regional contexts of China, the findings may not be universally applicable across different sociocultural environments. Additionally, the conduct and analysis of the artist-led case study heavily rely on the art context and are conducted through the lens of the artist's identity, which may introduce bias and limit the applicability of the research findings in other fields. This limitation could affect the scalability and generalisation of the findings. The study's reliance on new materialism and techno-feminist theories, particularly those of Donna Haraway and Judy Wajcman, might constrain the exploration of broader feminist and technological frameworks that could otherwise offer different perspectives on the research questions.

1.7 Literature Review in this Study

This study’s literature review constructs a theoretical foundation and background and guides the prototype design through four subdivided sections. The first section mainly reviews the development of video games and feminism in China, exploring the multifaceted cultural and historical influences on these two domains and highlighting the potential challenges and opportunities for conducting the artsit-led techno feminit GameArt practice in China. This section provides specific backgrounds and context for this research case study. The second part reviews new materialist theories, the concept of worlding, and the creative practice and research in the hybrid area of video games and art. It also studies the strategy of artists using workshops to impact broader audiences. And finally, it reviews the public’s distinct attitudes towards video games and art in China. This section provides the background and theoretical basis for this stuy to analysis and relocate the GameArt practice.The third section reviews VR with a main foucus on VR’s imapct on experiencers self-perception. It aslo reviews therioes related to “mirror stage”, and critical factors and that might influence participants’ perceptions. The third section offers theoretical

support and guidance for the VR GameArt prototype design and lays the groundwork for incorporating the “mirror apparatus” as one of the prototype design strategies. The fourth segment studies numerous design elements that may impact participants’ perceptions in video games, art, and sociocultural contexts, It also explores the studies related to “counterplay” in gaming cultural and reviews Donna Haraway’s concept of “situated knowledge”[21] [7], [363]. The fourth part of the literature review provides principles for specific designs in prototype to support another prototype design strategy-female-focused narratives.

1.8 Methodological Approach of This Study

This practice-based research employs a mixed methods approach. The study integrates theories and practices to establish a framework for exploring an artist-led GameArt practice informed by techno-feminist principles. It aims to facilitate future female professionals at the intersection of technology and art to reconsider their perceptions of socially constructed gender roles in China and to promote active engagement of Chinese women in the creative technological sector. Mixed methods is particularly suited to this study as it facilitates a nuanced examination of the interplay between the researcher’s artistic practice and broader societal dynamics. Moreover, this methodology is critical for understanding the multifaceted influence of this study within contexts such as video games, art, immersive technology, and techno-feminism.

The research unfolds through a structured two-stage process designed to build and analyse this artist-led GameArt practice comprehensively. The Alpha stage lays the foundational theoretical and practical elements, beginning with a literature review to identify existing knowledge and gaps related to GameArt and the application of techno-feminist principles in artistic practices for challenging gender stereotypes in China. Then, interviews with professionals in the gaming and art industries are conducted to investigate the suitable conducting context for this artist-led GameArt practice. The Alpha stage also involves constructing a theoretical framework aligned with techno-

[21] Donna Haraway’s concept of “situated knowledge” refers to all knowledge specific to its context, reflecting the particular viewpoints and positions of the knower, challenging claims of objective or universal knowledge [7], [363].

feminist principles and new materialist theories, guiding the development of the prototype and workshops' design in art institutions. The prototype design and development process are then initiated, creating an initial model of the GameArt, which is refined based on feedback and observed interactions during internal prototype testing.

The Beta stage focuses on broader application and empirical analysis. Workshops conducted in art institutions implement the refined GameArt prototype in more public, interactive settings, which facilitates engagement with participants who are potential future female professionals at the intersection of technology and art in China. These workshops serve not only as spaces for participants' interaction but also as reflective sites where the researcher and participants collaboratively explore and challenge existing gender stereotypes. Integrated feedback mechanisms throughout the workshops continuously refine the GameArt practice based on participant insights, enhancing the interactive and iterative nature of this research. The Beta stage is crucial not only for assessing the impact of the GameArt experience on participants' perceptions of gender stereotypes through systematic data analysis of the interactions and feedback collected during these workshops but also for creating space for women to discuss and examine traditional female roles and societal gender expectations in China.

Mixed methods enable the researcher to conduct this artist-led GameArt practice across various domains and facilitate deep, reflective inquiry into how the researcher's own artistic practice intersects with participants' experiences within the prototype and workshops. This methodological approach allows for a nuanced exploration and articulation of how individual narratives and collective practices among participants influence and are influenced by societal dynamics. Furthermore, mixed methods not only facilitate capturing diverse data but also foster close engagement with participants, enhancing the study's depth by encouraging profound reflection on the themes explored.

1.9 Thesis Structure

This thesis is structured into eight chapters: Introduction, Literature Review, Theoretical Framework, Methodology, Practice, Results, Discussion, and Conclusion.

The Introduction Chapter introduces the research background and opportunities for this artisit-led GameArt practice case study in China. It also delineates the research questions and aims, briefly describing the methodologies adopted in this interdisciplinary research. Moreover, it specifies the study’s scope and limitations while highlighting its prospective contributions and overall significance.

The Literature Review is divided into four parts. The first section examines the development of video games and feminism in China, exploring cultural and historical impacts and identifying challenges and opportunities for integrating techno-feminist principles in artist-led GameArt practice. The second part reviews new materialist theories, the concept of worlding, creative practices in the hybrid domain of video games and art, and workshops focusing on artists' strategies to engage broader audiences. The third section delves into the impact of VR on self-perception and explores theories like the "mirror stage" to support the VR GameArt prototype design. Finally, the fourth segment reviews design elements that may affect participant perceptions and introduces principles for incorporating female-focused narratives in prototype designs.

The Theoretical Framework chapter first analyses and relocates the medium characteristics of GameArt practice, clarifying its concept and scope, and discusses its application in the art context in China. It then delves into the prototype design strategies that focus on female narratives and the “mirror apparatus” and how such design could provoke reflections on gender stereotypes in China. Finally, it states the relationship between theories such as new materialism and techno-feminism with this study, laying the foundation for integrating theory and practice.

The Methodology chapter provides a detailed introduction to this study’s autoethnographic approach, the Alpha and Beta stages of this practice-based case study, the target audience,

ethical considerations, challenges and resolutions, evaluating methods, expected research outcomes and results, the relationship between the artist's identity and this study, and potential research limitations. It also explains how these data collection and analysis are used to address the main research question.

The Practice chapter describes the process of research practice in the Alpha and Beta stages in detail, mainly including interviews with industry professionals, the creation of the VR GameArt prototype, and conducting workshops in the art context in London, Nanjing, and Beijing. Moreover, it addresses what the process of these practice activities validates and addresses the research questions.

The Results chapter presents the main findings obtained during the Alpha and Beta stages, including findings from theoretical analysis, such as relating GameArt practice and partial findings, such as feedback from workshops and the low-fidelity prototypes(LFPs) created by workshop participants.

The Discussion chapter delves into in-depth analysis and interpretation of the research findings, starting from the four sub-questions and how they support the main research question. It also compares the research outcomes with expectations and existing studies while discussing its contributions, limitations, suggestions for future research, and self-reflection.

The Conclusion chapter recaps this case study and summarises the main findings and contributions of the entire study; revisits the answers to the main research question and sub-questions; outlines the study's limitations and directions for future research.

1.10 Potential Contributions and Significance of the Study

This study contributes to the fields of digital art and time-based media by defining and critically relocating GameArt practice, thereby bridging the gap between the widespread practical

application of GameArt as practice and the relative absence of rigorous academic scaffolding and terminology around the practice itself. The research is positioned to promote women's engagement with the creative technology sector and explore the adoption of techno-feminist principles in artistic practices in China. By integrating the strategies of female-focused narratives and "mirror apparatus" into the prototype design, this study may bring new understandings to the interplay between video game technologies, digital art and women.

This research may have significance in the intersectional narratives of video games and art by relocating the medium characteristics of GameArt practice and advancing academic research in the field. It may also facilitate gender diversity in technology by promoting women's participation in the creative technology sector. Moreover, integrating techno-feminist principles into artistic practices may lead to new forms of creation to express women's experiences in China. Further, the prototype design's new insight into the interplay between video game technologies, digital art, and women may facilitate the development of innovative educational tools and collaborative projects that emphasise the critical role of gender perspectives in the design process.

Chapter 2: Literature Review

Chapter Introduction

This study's literature review encompasses four parts. It reveals the existing research gaps and provides the theoretical foundation and backgrounds for the artist-led GameArt practice. It also offers guidance on the construction of the VR GameArt prototype and the development of workshops.

Section 2.1 mainly reviews the development of video games and feminism in China, exploring the multifaceted cultural and historical influences. Techno-feminism in China, particularly its application of game technology or language as a techno-feminist strategy, is still in its infancy, which provides a specific context for techno-feminist GameArt practices in China.

Section 2.2 reviews the principles of new materialism and the worlding concept, researches the crossover of video games and art, especially the practice related to techno-feminism, and examines how artists interact with the public through workshops. It ultimately focuses on the “gap” between video games and art in China. These aspects offer a basis for understanding and analysing the new relationships, characteristics, and attributes manifested in current GameArt practices, revealing possible contexts for conducting techno-feminist GameArt practice in China: The art field.

Section 2.3 reviews theories and research related to this study’s prototype design, including critical factors affecting cognition and self-perception in IVEs, Jacques Lacan’s mirror stage and its intrinsic connection with contemporary Filtered selfies, and the mirrored reflections produced by non-mirrored media. This section serves as a foundation for integrating the concept of “mirror apparatus” into the prototype’s design.

Section 2.4 reviews research across various domains related to female identity in video games, art, and socio-culture, aiming to lay the groundwork for incorporating these elements into the prototype development, which centres on female narratives to influence women’s perceptions. Furthermore, the review of counterplay and “situated knowledge” literature outlines strategies for narrative construction and engaging participants in counterplay within the prototype’s design. This section underpins the prototype design, particularly focusing on highlighting female narratives to encourage participants to reflect on women’s identity and positioning issues in China and explore design potentials for changing perceptions.

2.1 (Techno-)Feminism and Video Games in China

“Currently, I think something like this（referring associating feminism with video games）is probably unlikely to happen in China” [66].

"I do not think it would happen in a while...I feel that this (feminist theme) is a taboo in the product…" [67].

"There is no way to replicate this (feminist approaches in European and American countries) in China" [91].

"In China, we can only adopt a gentle approach (to feminism)..." [69]

2.1.1 (Techno-) Feminism in China

2.1.1.1 Three Historical Stages

Feminist theories in China is "travelling theories" [25], [26]. The concept of feminism was introduced to China in the early 20th century along with socio-political movements [26]-[29]. As part of the global feminist movement [30]-[32], feminist movements and theories in China have been influenced by those in European and American countries during [518] [27]-[29], [33], they have also been indigenised [25]. The development of feminism in China broadly experienced three historical phases: 1) Before 1949, feminist movements were tangled with the dream of establishing the nation and state[22] [26], [103]; 2) During the Maoist period[23], the concept of feminism revolved around the idea of "masculinisation" of women[24] [25], [29], [36], [104]-[107]; 3) After the late 1970s, with the start of China's economic reforms[25], the doption of feminist principles became a way for

[22] From the late Qing Dynasty to 1949, China's feminist movement, driven by male revolutionaries and nationalists influenced by Western ideas, focused on issues like abolishing foot-binding and gaining voting rights, but was mainly a tool linked to the goal of national state-building [103].
[23] Maoist period: approximately from the establishment of New China in 1949 to the late 1970s, before China began the reform and opening-up policy.
[24] The policies during the Maoist era in China allowed for superficial equality between men and women in class-based categories, emphasising complete similarity between women and men in all aspects, which led to the masculinisation of women and thereby denying women's unique identities [104].
[25] The Chinese economic reform, also known as the Reform and Opening-up or the opening of China, was launched in 1978 and was led by Deng Xiaoping. It is the economic reform program to establish a socialist market economy in China.

women to explore their socio-political space[26] [36], [104], [105], [107], [108]. Overall, the feminist movement in 20th-century China was closely associated with the desire for national, economic, and cultural construction. The development of feminist theories continued to seek a balance between nationalism and modernity [103], [104]. While women successfully integrated into new economic and social structures during this period, their political dependence on the state increased [107].

2.1.1.2 Rediscovering Femininity via Consumption in Digital Era

Entering the 21st century, portraying women as "neoliberal" consumers emerged as a crucial approach to adapt to the deepening transformation of China's economic structure [38], [39]. The reason mainly stemmed from the economy's growth engine transitioning from production to consumption[27]. This shift leads to a reorganisation of the biopolitical value system [40], with the civic value being more reflected in consumption capacity than production ability [39]. Chinese women have been playing a vital role in stimulating consumption [38], therefore, they have been portrayed as the chief consumers in the household and the saviours of a stagnant national economy in the public media [38]. The idea of empowering women and restorating feminine attributes through investment and consumption has been formulated to contribute to economic growth pursuits [43], [44] by establishing the images of high "Su Zhi" citizen, the middle-class lifestyle[28], and even recently the "spendthrift chicks"[29] [38]-[40]. To establish this "neoliberal"

---

[26] Since the late 1970s, China's Reform and Opening-up brought Western feminist theories, leading to self-awareness in women, critiques of Mao's gender policies, the rise of NGOs aiding women, more practical rights for women in education and business, but also growing disparities in education, wages, and social status among women from different classes and locations because of the transformations in social classifications caused by economic development [26], [36], [104], [105], [107], [108].

[27] Beginning in the mid-1990s, China's "consumer revolution" was strategically implemented as a policy aimed at integrating its national economy with global trends as a means to reshape and extend state authority through indirect governance mechanisms [39].

[28] The concept of "Su Zhi" (quality) in contemporary China not only represents social differentiation in consumer behaviour and aspirations for middle-class mobility but also contrasts middle-class urban women as exemplars of affluent consumers with female migrant workers portrayed negatively due to lower purchasing power, thereby serving as a nuanced discourse on value transfer between social classes [38], [40].

[29] "Spendthrift chicks" refers to young, affluent, and shopaholic women who are portrayed as the norm of female subjectivity in China. They are hailed as crucial contributors to the national and global economy and symbolic of the interplay between state patriarchy and consumer capitalism [38].

consumer image, the public, markets, enterprises, and media collectively participated, with digital technologies playing a significant supportive role [38]. For example, the advertisement from Tmall during the Double Eleven online shopping festive in 2016 labelled women as intelligent consumers, which is considered higher praise than acknowledging them as proficient earners [38]. Moreover, in 2015, “spendthrift chicks” in China were described as saviours of the United States economy in Alipay’s Weibo post [38]. Those collective efforts act as a mechanism that depoliticises and individualises, shifting the focus of power and oppression away from those in authority and onto the individual consumer [38], [43]. Consequently, while women have become “neoliberal” consumers, they are simultaneously being transformed into objects of consumption, with technology-induced gender inequalities becoming increasingly evident [34], [38], [43].

2.1.1.3 Techno-feminist Theories and Their Adoption in Video Games and Digital Art

Feminist theories of technology underwent a transition from challenging the enduring association between technology and masculinity to exploring the gendered nature of technology itself over the last few decades of the 20th century [6]. Many scholars from second-wave feminism provided diverse insights to explore the nuanced classifications of technology and femininity and their historical variability. However, many feminists generally hold a pessimistic view of achieving gender equality through technology [6]. In contrast, the new generation of feminist scholars, such as Sadie Plant, Donna Haraway, and Judy Wajcman, have been relatively optimistic. Their theories deconstruct the gender binary and highlight technology’s potential as a powerful tool to enhance women’s capabilities[5], [7]-[9]. In 2004, Wajcman introduced the concept of "technofeminism" [5], which argues that technology and gender mutually shape each other within specific sociocultural frameworks [516]. Her theories underscore the critical role of women’s participation in the fields of technology design, development, and innovation as essential for achieving gender equality [6]. Wajcman champions the increased inclusion of women in technology design roles as a means to alter gender power dynamics within a society driven by technology [6].

Early research on feminist theories in video games was founded on the studies of Brenda Laurel, Janet Murray, and Sherry Turkle [10]. Subsequently, Cassell and Jenkins (1998) explored the development of gender research in gaming, focusing on the early involvement of women in game

design and participation [11]. The research focus shifted from viewing games as tools for building women's confidence and skills in new technologies to actively encouraging and supporting women in using computers and learning programming. In 2010, [12] examined the evolution of gender and game studies over the previous thirty years, revealing that these researches primarily focused on exploring specific patterns of female video game playing and their preferences in gameplay. However, there have been significant advancements in this area over the last decade by various studies [13]-[19]. For instance, recent research has explored gender inclusivity within gaming culture [14], while other studies have analysed the effects of all-female game jams on enhancing diversity within the gaming industry [17].

Meanwhile, many feminist scholars have focused on the nexus of art, feminism, and technology. For example, Judith Brodsky has examined how female digital artists integrate feminist concepts into dominant visual cultures, specifically targeting video games and anime, thus markedly affecting both the gaming indusrry and feminist developers [20], [21]. Jennifer Way has explored how digital art interacts with techno-feminist ideologies to understand the significance and influence of technology [22].

The exploration of techno-feminism in China is a developing area of study. In Chinese literature[30], while there is substantial research on women, gender, and technology, studies employing "more recent techno-feminist theories" as defined by Wajcman [6] mostly focus on introducing Wajcman's theories [509]-[513]. As a result, there is currently little research in Chinese literature that applies techno-feminist principles to research or analysis. On the contrary, in English literature, there are a significant body of research has addressed various aspects of feminist theory in the context of gender and technology in China [35]-[38], [41]-[44], covering topics such as fashion culture [36], shopping festivals [38], and the beauty economy [43]. These studies offer diverse perspectives on the complex interactions between women and technology in China. However, most of them focus on evaluating the imapct of degital media and consumerism on Chinese women's experiences through a feminist lens [35]-[37], [42]-[44] or the development of feminist theories or movements in

[30] According to the data on National Knowledge Infrastructure (CNKI), established in 1999, China's most crucial research and information publishing institution [491].

China against consumerism and digital culture [41], [45]. Only a few scholars have specifically applied Wajcman's techno-feminist theories to examine digital technology's impact on Chinese women. For example, some studies analyse how women in urban China utilise dating apps [65]. Others investigate the influence of beauty apps and "beauty filters" in technologies like facial scanning on Alipay, highlighting their control over Chinese women's bodies[34], [515].

Regarding applying the techno-feminist perspective in video game studies, in Chinese literature, there are only about 60 publications[31] related to gaming and women were documented from 2000[32] to 2019 on China National Knowledge Infrastructure (CNKI)[33] [52]. Those studies provide the understanding of video games and Chinese women in three categories: 1) Consumption and market [55], [56], [58], [62]; 2) Psychological and cultural aspects [46]-[64]; 3) Game genres, design, and technology [54], [61], [63], [89]. Some of these studies are related to feminist studies in gaming [48], [49]. However, studies that utilise techno-feminist theories or perspectives for analysis or research are rare and often lack in-depth explorations. For example, a recent article highlights that examining women practitioners and people who regulate technology in the gaming industry is essential for gender research in video games. Still, it only remains on an opinion level without further addressing [46]. In English literature, a few studies adopt a techno-feminist perspective in analysing Chinese women and video games. For example, some studies explore how gender role norms in Chinese society shape digital gaming spaces and influence female game players[18], and some research on how Chinese women engage with romantic beliefs through dating video games [19]. Overall, practice-based studies in gaming from a techno-femnist lens with highlights on the mutual articulation between video game technology and gender are rare.

Numerous feminists have used their artworks, writing, or community activism across various disciplines to explore, promote, or reflect feminist theories in technologies—for example, VNS

[31] In China, scholarly interest was not in games and women until Mr Love: Queen's Choice triggered the booming of Female-targeted Games (FTGames) in 2017. From 2000 to 2016, studies on females and video games rose from an average of 1.76 articles per year to 10 articles per year in 2017-2019 [52].

[32] 2000 is the earliest year that relevant literature can be found on the CNKI.

[33] CNKI: China National Knowledge Infrastructure, established in 1999, is China's most crucial Chinese research and information publishing institution [491].

Matrix, Sadie Plant, Donna Haraway, Nancy Paterson, and Judy Wajcman. Also, creative practices that apply or reflect techno-feminist principles are increasingly evident in the hybrid area of video games and art, where many creators leverage GameArt practices to contest male-dominated narratives in the gaming industry and beyond. For instance, the works of Angela Washko, Anna Anthropy, and Lena NW in this hybrid space offer innovative approaches to addressing and representing gender issues within digital cultures [157], [162], [169]. However, in China, the primary relevance of applying technofeminist principles may currently reside in using the internet to challenge gender bias. Current feminist resistance mainly operates through tripartite activities such as “philanthropic volunteerism,” cyberspace platforms, and performing arts [45]. The notable activisms include Occupy the Men’s Toilet [109], solidarity with women who are victims of domestic violence [41], and against sexual harassment, such as MeToo [110]. The younger generation is increasingly using the internet and social media as effective means to broaden the impact of their feminist activities [111], [112], reflecting a grassroots, bottom-up approach [112], [113] outside the conventional system [111], [113], [114]. However, this approach does not facilitate changes originating from the technology itself. Moreover, the overarching state-media dynamic ultimately influences how the media engages with their movement [109].

In China, currently, not only are creative practices that apply or reflect techno-feminist principles at the intersection of video games and art nearly non-existent, but such innovative practices are also scarce within the fields of gaming and art individually. In the gaming fields, activities or creative practices that apply techno-feminist principles are scarcely observed, mainly due to the unique role of video games in China (which will be addressed in 2.1.2.2). While some online female gaming communities have begun questioning in-game gender stereotypes, the amount and scale of these communities are limited [69]. Therefore, they have not received adequate attention or formed a phenomenal feminist discussion or movement.

Meanwhile, in the Chinese art field, women artists generally maintain an ambiguous attitude toward feminism due to many historical reasons. Artistic creations about Individual thoughts and experiences were prohibited before the Reform and Opening-up period, not to mention the exploration of gender issues [115]. Until the 1990s, Female artists such as Cui Xuwen, Lin

Tianmiao, Yin Xiuzhen, and Yu Hong began to create works focused on self-experience and the female body [115], [116]. Entering the millennium, a new generation of Chinese women artists have integrated the self into a broader historical and social context [117]. They employ various media and technologies to investigate the perception of women's self-identity and social identity in a globalised and digital age, for example, Cao Fei, Han Yajuan, Lu Yang, Ma Qiusha, and Ye Funa. Although multiple Chinese contemporary female artists' works may display a feminist lens to some extent in China [117], most hold a vague standpoint on feminism, except for a few artisits, such as Xiao Lu and Li Xinmo [118].

If classified according to Jennifer Way's categorisation, that is, dividing art practices based on how artists utilise digital technology and the manner and content of feminism into three categories [22], contemporary Chinese art practices engaging with this area remain relatively sparse. Way's three categories are: "Cyberfeminist Critique": Artists critique digital representations of women in popular culture, promoting alternatives for women's empowerment in technology and society; "Networking Communities": Utilising the internet, artists connect dispersed individuals, fostering a global community for feminist discussion and activism; and "Hacktivist Pedagogy": Artists explore the power dynamics in social media, critiquing the influence of technology rhetoric on societal struggles and the impact of neoliberal policies [22]. In contemporary Chinese art practice, there might be some artworks engaged with the "Cyberfeminist Critique"; for example, female artist Zou Yaqi disguised herself as a wealthy socialite, using this identity to live in Beijing for 21 days without spending money, and then shared her experiences online as an experimental performance art on "living off society's excess" [119], [120]. However, the latter two categories are pretty rare.

2.1.1.4 Public Perceptions of Feminism in China

In China, some scholar believes that some radical feminists maintain an extreme stance, positioning them staunchly against men [518], which contributes to a public perception that equates feminism with being anti-men [67], [517], [518]. Unfortunately, the fact is that the public often misinterprets the concept of feminism as an action to advocate for female dominance over men [67]. Moreover, feminism has also sometimes become a label used as a tool for commercial success, such as attracting internet traffic in the age of digitalisation and consumerism [67], [92].

This damaging misunderstanding leads to low societal tolerance for feminists, prompting women to distance themselves from the feminist identity to avoid negative impacts on their lives and careers. Therefore, most discussions around feminism are indirect and subtle; for example, people tend to employ the term “ping quan” (equal rights) over “nv quan” (feminism) to express claims about a need for equal opportunities in areas like job applications and compensation [67]-[69]. These goals are consistent with feminist principles, but in Chinese, the literal meaning of “nv quan” implies aggressiveness and radicalism, whereas “ping quan” denotes a more balanced and rational approach that avoids direct opposition between women and men. Moreover,
many people discuss the application of feminism from a third-person perspective. They often agree with feminist views but only engage in verbal discussions. As one interviewee put it: “I believe all feminist movements should be very intense, but I am not a feminist” [68], leading to a situation where the pursuit of “ping quan” often lacks agency and remains merely a vision. The concept of feminism often lacks participants’ agency because, unlike the grassroots movements and theoretical explorations that emerged spontaneously among women in European and American countries, feminism was introduced into China and disseminated from the top down at the policy level [517]. This approach has led to the application of feminist principles, often being merely superficial imitations or references and, at times, merely a topic of conversation for the public.

2.1.2 Women and Gaming in China

2.1.2.1 Current Landscape of Video Games in China

Video games have been a unique development in China. Its market emergence dates back to the 1980s and it evolves through phases of emergence, legalised development, and booming growth [70], [74]-[77], [79]-[81], [96], [99], [100], [121]-[125]. From 1980 to 1999, the video game industry was dominated by the influx of foreign video games, leading to a rise in consumer and “techno-nationalism” [81] and encouraging Chinese gaming companies to enter the market. From 2000 to 2009, the gaming industry saw legalised development, with the popularity of personal computers and improved telecom infrastructure boosting online gaming [80], leading to regulatory changes for the gaming industry [96], [122], [123] and the integration of gaming technologies development into

national strategies [72]. During this period, Chinese gaming companies started to occupy the local market centre [124]. Post-2010, the gaming industry experienced significant growth, contributing US$45.6 billion in 2021 [99] and becoming a leader in global revenue [125]. The government supports game projects for cultural reputation and economic growth while enforcing strict regulations [74], [75] and promoting the global expansion of Chinese video games [99], [100]. Nowadays, the Chinese gaming industry is a massive sector with a substantial game player base. The number of game players reached 667 million in 2021 [77], [79]. Because of the booming female gaming market since 2017, female gamers in China achieved 300 million in 2019 [78], as shown in Fig. 1. According to the CGIGC report in 2021, while overall gamer growth is stalling, the figure for female and older gamers is still increasing [77]. Meanwhile, it has been seen the trend that top game companies monopolise the gaming industry, as shown in Fig. 2, which leaves a narrow space for Small and Medium Enterprises (SMEs) and indie game developers [124], [126].

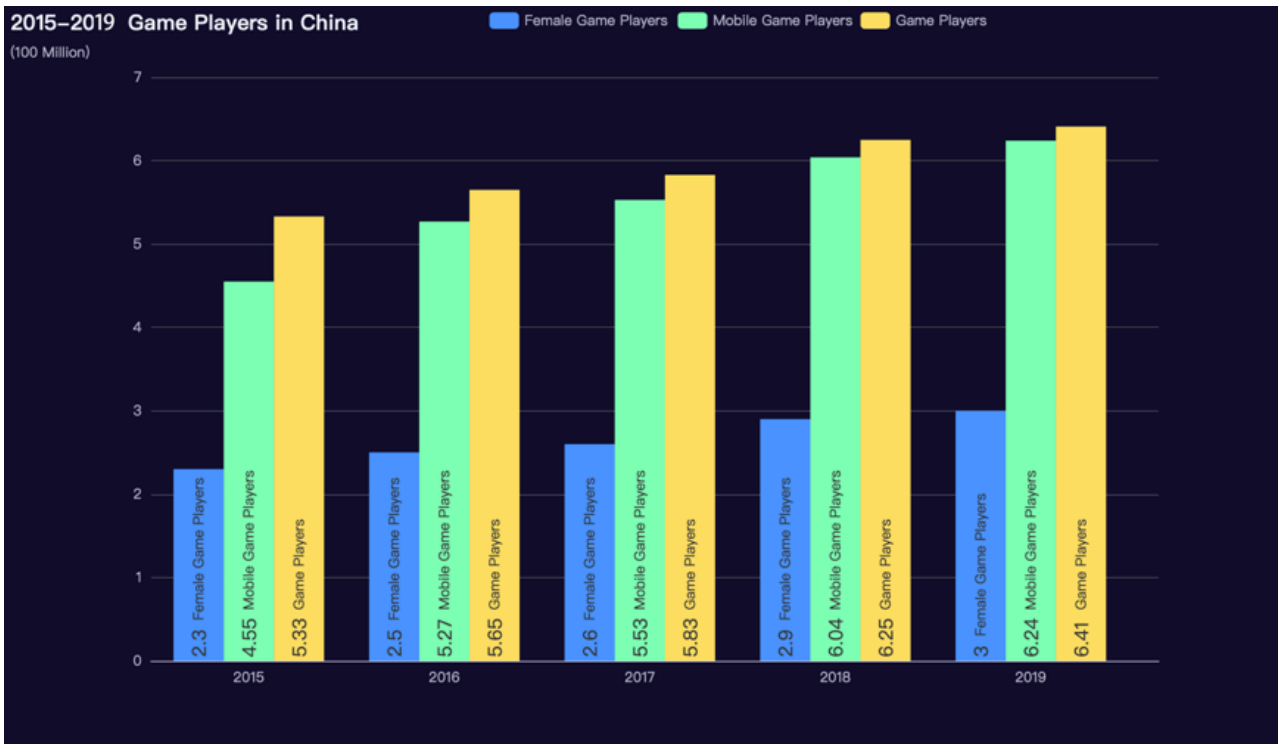

Fig. 1. 2015 to 2019 numbers of game players, mobile game players and female game players in China. Data source from CGIGC China Gaming Industry Report 2019 [93].

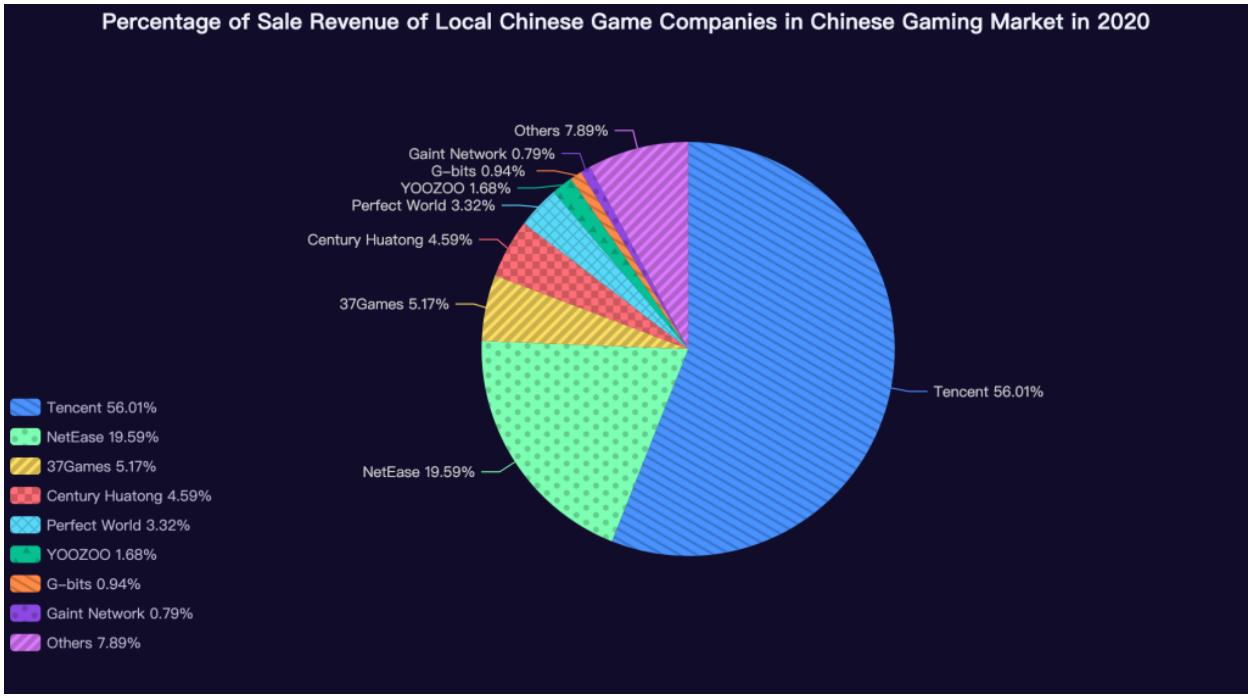

Fig. 2. Percentage of Sale Revenue of Local Chinese Game Companies in China's Gaming Market 2020. Data sources: CGIGC, CNG, and FORWARD-THE ECONOMIST [79], [126].

2.1.2.2 The Unique Role of Video Games in China

Video games play a unique role in China. The development of video game technologies and the gaming industry carries the mission of national economic and technological revival in China. Video games are also considered an essential medium that can carry and embody mainstream culture and ideology to influence Chinese society. Some scholar states that video games serve as a solution to the ideological contradictions between communist and capitalist ideals amid social and economic shifts [81], which has led to the integration of the advocation of self-developed video games into national strategies for comprehensive development, receiving substantial state support for special projects [72]-[75], [97], as well as strict regulation across the whole gaming industry [82]-[88].

Video games function as a cultural medium and have a long history. In the early stage of the gaming industry development, creating "Chinese imagery" in video games is regarded as a resistance to the Japanese and the United States' dominant gaming market in China and "cultural

colonisation"[34] [71]. In the legalised period, video game development stepped into a "glocalised" stage. The themes of Chinese self-developed video games were predominantly established on Chinese legends and dynastic history [70]. And then, the content design shifted to be the manifestation of Chinese values and the representation of the spirit of contemporary China. Along all the stages, the video game development process receives the state's guidance, regulation and promotion [81]-[85].

Meanwhile, video games also satisfy the requirement of projecting the national pride of Chinese game players [70], [80]. Consequently, video games become a cultural carrier, outwardly as a cultural export form, which has been highlighted in the "Culture Go Global" strategy [99], [100]. Inwardly, video games have been involved in significant social occasions. For example, a series of sports games were developed to promote the spirit of China and the Olympics during the Beijing 2008 Olympic Games [80] and the anti-corruption game Incorruptible Warrior [127].

2.1.2.3 Constrained Environment for Small and Medium-sized Enterprises (SMEs) and Indie Game Developers

“This (feminist-related) subject may not pass the (game license’s) review.” “We must consider whether it is easy to get a game license. Otherwise, it is a waste of time.” [67]

“…Because of the delay of the game license, it has been under review for nearly two years, the game has not been able to operate online.” [67]

Stringent regulations, state support targeted at special video game projects, and monopolies by large gaming companies significantly limit the opportunities for SMEs and indie game developers in China. On the one hand, video games are severely regulated because of their unique attributes in China. Despite the state implementing gaming regulations [96], establishing governmental gaming sections [98], and integrating game development into national strategies [72]-[75], with substantial

[34] From 1994 to 1998, 87% of the 55 self-developed Chinese games were associated with inheriting national modernisation, using "Chinese imagery" to resist the foreign countries' dominant game culture.

financial support [97], [99], [100], these measures favour projects that align with games as cultural carriers. Game developers face various challenges, for example, strict constraints on content creation [82]-[84], the complex and challenging game license application process, severe penalties for unlicensed games, and mandatory access to Anti-Addiction Systems[35] [86]-[88]. On the other hand, giant gaming companies occupy significant capital and talent resources and have a complete industry chain [124], [126]. Consequently, SMEs and indie game developers focusing more on creativity and innovation confront the challenges of navigating regulations, acquiring game licenses, and competing with large companies' monopolies. In 2019, the number of bankruptcies and suspensions of game companies reached 18,710 [128].

2.1.2.4 Female-targeted Games (FTGames)

The concept of Nv Xing Xiang games (女性向游戏) comes from female games（けゲーム）in Japan [55]. It originally referred to games designed specifically for female players [56], [89]. However, when this video game genre was introduced to China, it was indigenised and developed new characteristics [89], and then became the current NV Xing video game. According to its current characteristics in China, this research uses a female-targeted game (FTGame) as its English translation to distinguish it from the concept of female games and Japanese female games.

The first Japanese female game was developed in the 1990s with the initial intention of challenging the male dominance of the video game[36] [89]. This game genre was not acknowledged and became popular in China until the romantic dating game "*Mr Love: Queen's Choice*" (by Papergames) [129] was released in 2017, which caused the booming of FTGames and triggered a series of crazy online and offline social phenomena of Chinese women dating "paper husbands"

[35] Since 2005, following the National Press and Publication Administration's issuance of the "Development of Anti-addiction System for Online Games (Trial)" [86], China has increasingly enforced real-name registration, time limits, and consumption caps in online gaming, culminating in a 2021 mandate requiring all game operators to register for the Anti-addiction system to distribute and publish games, with unregistered games barred from operation [87], [88].

[36] In 1994, in Japan, a group of female employees in KOEI released the first romantic simulation game Angelique for women, which was made to challenge the idea that "games are for men" and is recognised as the starting piece for the Otome game market.

from the game [130]. Within a month since the game was launched, "*Mr Love"* has already reached 7.113 million installs, with over 94.2% female players and a monthly turnover of 300 million RMB [56]. "*Mr Love"* and two other FTGames[38]. created over 43 billion RMB in revenue in 2018 [89].

Opinions on FTGames are diverse and varied in China. Some scholars attribute the rise of FTGames to women's increased economic status and growing awareness of female empowerment [56], [57], either recognising women's economic influence or their central role in these games. Others, however, view FTGames as "Sheconomy" products, targeting women's consumption interests and creating unrealistic fantasies [47], [55], [64], [90]. Furthermore, FTGames play a crucial role in the process of rediscovering femininity via consumption [38] because the game design, content and worldview are still mainly dominated by capital and men, reinforcing the values of patriarchy and consumerism. Industry professionals this study interviewed concur that while FTGames acknowledge women's needs to an extent, their primary driving force remains consumption [66], [67], [95].

2.1.2.5 Women Practitioners in Chinese Gaming Industry

A 2021 study revealed that women constitute only 22% of the Chinese gaming industry's workforce, highlighting a significant research gap on female practitioners in this sector [52]. This study's in-depth interviews with seven female professionals in gaming industey yielded several insights. First, the industry is still male dominated, with a male to female ratio of approximately 7:3 [66], [91], [95]. Women usually occupy the positions of game planning, art [67], [91] but rarely in game development [66], [67], [92], [95], which may primarily be because of the disparity in the percentage of men to women in studying computing [67] and more profound socio-cultural reasons relate to the expectation of female's traditional role that not associated much with computer technology from the society and family [66], [67]. Second, most respondents mentioned they feel they are fairly treated and even favored by male colleagues[39] [66], [67], [69], [91], [92]. Some

[38] Tencent' s romantic dress-up game Yun Shang Yu Yi and NetEase' s ancient romance game Love Is Justice.

[39] According to the contextual setting during the interviews, the respondents believe that the fair treatment they receive daily in the gaming industry is primarily based on several premises. Firstly, the challenges faced by women in this sector reflect broader societal and gender inequalities, with

believes that the gaming industry is relatively "simple"[40] [66], [67]. Third, pregnancy is perceived as a major workplace challenge [66], [67], with only a few mentioning experiences of harassment in. work [91]. Fourth, securing funding and game licenses are major challenges [66], [67]. Fifth, most interviewees plan to continue in the gaming industry long-term. However, none of them would like to be identified as feminists. Moreover, some mentioned no need to elevate their games to a feminist level [66], [67], [69], [91], [92].

2.2 New Materialism, Worlding, and GameArt Practice

"I have not seen anyone using this ((refers to the techno-feminist GameArt practice) approach in China. Moreover, I am not saying that I only expect women artists to use it in this way; I expect all artists to focus on this subject." [68]

"I think it (refers to the techno-feminist GameArt practice) is excellent. However, it is a niche thing and might not be that popular. It would be fantastic even if there were someone to try to do it." [95]

2.2.1 New Materialism

New materialism, a philosophical and cultural theory movement that emerged in the late 20th and early 21st centuries. The term was initially proposed by philosopher Rosi Braidotti in the late 1990s [131], [132]. It has since been extensively reinterpreted in fields such as cultural studies, feminist research, and social sciences. New materialist theory lacks a unified definition but is generally

---

issues like pregnancy and workplace harassment being common across all industries, not just gaming. Secondly, many interviewees are from small to medium-sized gaming firms or are independent developers. They encounter challenges like funding shortages and game certification issues, which are also faced by their male colleagues, thus fostering a sense of camaraderie rather than opposition [66]. Thirdly, because women are scarce in this male-dominated field, they often receive more attention and favourable treatment.

[40] Some interviewees think that because major game companies are in South China, the business culture there usually focuses on efficiency and outcomes, with less bureaucracy and superficiality. Therefore, women are likely to have more opportunities to showcase their talents [66]. Some think the gaming industry is "better and simpler" than some traditional companies where female employees might have to have dinner to entertain clients to win business deals [67].

regarded as encompassing a non-anthropocentric realism [133], [134], focusing on matter, biology, technology, and practice, moving beyond an emphasis on texts, discourses, and symbols [134]. Examples include Donna Haraway's cyborg theory, challenging traditional binary oppositions of gender, species, and technology[41] [7]; Jane Bennett's exploration of material vibrancy and advocacy of non-human-centric ethical perspectives[42] [135]; Karen Barad's "agential realism,"[43] emphasising the "intra-action" between materials, discourse, and the interplay of observer and observed, revealing the necessity of pre-established bodies' participation in action with each other [136], [137]; and Rosi Braidotti's perspective of the body as a nexus of culture, society, and technology, exploring identity, subjectivity, and ethics from a posthumanist viewpoint[44] [138]-[140].

New materialism theory is based on a shift from epistemology to ontology and an awareness of material's intrinsic activity [133], [134], advocating for a "turn to matter" in both theory and practice [134]. This shift emphasises the materiality of the world and all things, questioning research methods focused solely on social "representation" and challenging a range of traditional binary oppositions,[45] advocating for a reevaluation of methods for data collection, analysis, and reporting [134]. New materialist theory considers a broad range of materials, including human bodies, non-living organisms, tangible objects, spaces and places along with their natural and architectural environments, and even material forces such as gravity and time, as well as abstract concepts, human constructs, imagination, memory, and thought [134]. As a medium of thought, it breaks

---

[41] Donna Haraway, in 1985, introduced the concept of the cyborg, conceptualising it as an entity that is neither purely biological nor mechanical, challenging traditional binary oppositions of gender, species, and technology [7].

[42] In her 2010 publication "Vibrant Matter," Jane Bennett explored the concept of matter's "vitality" and "power," promoting a dispersed and non-anthropocentric approach to moral perspectives [135].

[43] Karen Barad's "agential realism" highlights the interconnectedness of matter and discourse, and the relationship between observers and the observed. In "Meeting the Universe Halfway" (2007), she elaborated on this idea, stressing the reciprocal influence between entities and their observers [136].

[44] Rosi Braidotti, a leading posthumanist thinker, extensively examines new materialist concepts in her work, particularly exploring identity, subjectivity, and ethics from a non-human-centric perspective [138]-[140].

[45] New materialism not only challenges numerous binary oppositions in humanities and social sciences, such as "nature versus society," "human versus non-human," "living versus non-living," and thoughts versus materials, but also contests the epistemological distinctions between "subjectivity" and "objectivity" [134].

traditional patterns of time and existence to explore the intermingling of human and non-human processes [141]. Within this framework, subjects of observation and practice are seen as entangled emergences, a chaotic, unstructured, non-hierarchical, non-binary, open state of "withness" full of potential and possibilities [142, p.150]. In summary, New materialist theories provide a framework for reassessing and rethinking the relationship between humans and the material world

2.2.2 Worlding within the Framework of New Materialism

In 1927, Martin Heidegger first used worlding as a verb in philosophy to describe the world as a network of meaningful relations centered around human Dasein [143], [144]. Hannah Arendt responds by focusing on action and plurality as essential to world-making, claiming that worlding is a "political act" [141], [145]. Gayatri Spivak's article in 1985 states that worlding has the power of the "native to see himself as Other" [146], extending worlding in a postcolonial context [147]. In the New materialist perspective, worlding derives from the "non-representational theory" [148], which implies that worlding serves as a medium to interrupt usual temporal flows and ways of existence, thereby enabling an exploration of the intertwinement between humans and non-humans [141]. It is different from naturalism's ontological stance on the material world and constructionism's on the cultural world. Worlding within the framework of new materialism challenges the anthropocentric ontology, focusing more on "intra-actions" [136] and symbiosis with the environment, matter, non-human entities, and various life forms. Karen Barad's "agential realism" further elaborates on this idea [136]. She introduced posthumanist performativity [149], [150], highlighting the dynamic co-creation of reality via material-discursive practices [136], [150]. Her framework suggests the world is not just observed and described but continually reshaped through relationships and "intra-actions" [136] extending beyond the human sphere [133], [136]. Sociologists and anthropologists like Kathleen Stewart views worlding as the world's affectivity, emphasising the understanding and experiencing of the world through everyday practices and emotions, and highlighting the "affective nature" and "expressivity" of non-human agency [141], [503]. Morover, Ben Anderson and Paul Harrison have also explored worlding, focusing on materiality, affect, meaning, and contextual

relationships, broadening worlding to include the context that gives things meaning, focusing on how objects gain significance in specific socio-cultural settings, seeing the world as a dynamic ensemble of practices, relations, and capacities [141], [504].

New materialism's worlding provides a theoretical framework for this study's in-depth exploration and analysis of GameArt practices. From a new materialist perspective, GameArt practice is not merely an interactive medium or narrative tool but a dynamic, evolving ecosystem where developers, experiencers, technology, and speculative worlds co-create and shape meaning in continuous "intra-actions" [136], [137] (will be addressed in 3.1).

2.2.3 GameArt practice

2.2.3.1 The Entanglement of Video Games and Art

Developmental Origins

The intertwining of art and video games can be traced back to artists' pioneering use of computer graphics technologies in their creative works [1]. Since the invention of the first computer drawing program, Sketchpad, by Ivan Sutherland at MIT in 1962, various computer graphics technologies like Perlin noise, flocking algorithms, volume rendering, and fractals have been incorporated into artists' work [1]. Initially, computer equipment was primarily available in universities and corporate labs, requiring artists to collaborate with mathematicians and programmers. By the mid-1970s, Myron Krueger created "Video Place," a system combining computers and sensors across two interactive spaces. This setup allowed users to engage with each other's projections and virtual objects within a shared screen, investigating the possibilities of playful interactions between humans and digital media[46] [2]. In the 1980s, William Latham and Stephen Todd's Mutator1 program (1987), an interface for navigating multi-dimensional genetic spaces based on user

[46]"Videoplace" is a computer and sensory system featuring two spaces where participants, either in the same location or distant, can interact with each other's projections and virtual objects on a shared screen, with the ability to manipulate size, orientation, and colour [2].

preferences inspired by natural processes and natural selection, started employing game mechanics and user decisions to generate organic graphics in simulated ecosystems [3], [4]. The 1990s saw an increasing number of artists exploring the intersection between video games and art, coinciding with the spread of personal computers. For example, VNS Matrix[47] adopt computer games visual style or is utilised as a context in their art practice, with notable works like “All New Gen” (1991) [151]-[153]. Suzanne Treister[48] used Deluxe Paint II to create fictional video game stills [154]. Orhan Kipcak and Reini Urban[49] adopted Doom 2’s game engine to transform a first-person shooter game into an experience where art audiences navigate and evaluate artworks in a gallery space [155].

However, the actual interdisciplinary practices only began emerging after the millennium. It was boosted by the widespread availability of third-party game engines by the late 20th century. During this period, artists leveraged game engines to create notable works, for example, Julian Oliver’s work Ioq3aPaint (2003). It is a series of abstract images and video created by bugs in a game engine [194]. Cory Arcangel’s work Super Mario Clouds (2002), where he modified the video game Super Mario’s program to empty all visual assets except for the clouds and blue sky [156]. And Peggy Ahwesh’s She Puppet (2001), a re-edited recording of Ahwesh gameplay inverting the video game Tomb Raider, deconstructing the original narrative of Lara Croft in the game. In the 2010s, the widespread accessibility of gaming technology and the blurring of disciplinary boundaries further intensified the integration of video games and art, transforming the intersection of these two fields into an interdisciplinary innovation and research hub. More and more artists/creators have emeraged in this era, such as Angela Washko, Anna Anthropy, Danielle Brathwaite-Shirley, Han

[47] VNS Matrix is a cyberfeminist artist group established in Australia in 1991. Group members include Josephine Starrs, Francesca da Rimini, Virginia Barratt, and Julianne Pierce. They utilised computer game language in their creative context, with notable works like “All New Gen” (1991) [151]-[152].

[48] Suzanne Treister (b.1958), a UK artist, focuses on digital media and emerging technologies. Notable works include fictional video game stills using Deluxe Paint II [154].

[49] Orhan Kipcak (b.1957), a Turkish artist, and Reini Urban (b.1963), an Austrian computer scientist, utilised Doom 2’s game engine to transform a first-person shooter game into an experience where art viewers navigate and evaluate artworks in a gallery space [155].

Yajuan[50], Ian Cheng[51], Jacolby Satterwhite[52], Keiken[53], Pete Jiadong Qiang[54], Lena NW, Lawrence Lek[55], and Lu Yang[56]. Their GameArt practices demonstrate an increasingly rich and complex trend, reflecting a newer and deeper hybrid relationship between video games and art.

Dialogue between Two Fields

The dialogue between the field of video games and art continues to evolve and deepen. In 1989, the exhibition "Hot Circuits: A Video Arcade" held in the American Museum of the Moving Image first introduced video game consoles into an art museum setting [158]. This was followed by a series of exhibitions in art institutions exploring the relationship between the two, such as "Game On," held at London's Barbican in 2002, reviewed and researched the historical progression of video games [159]; "The Art of Video Games", held at the Smithsonian American Art Museum in 2012, aimed to explore the potential and value of video games as an art medium [160]; "Videogames" at the V&A Museum in 2018 focused on creative player communities and contemporary media definitions [172], [173]; and "Reclaiming Games" hosted by the Central Academy of Fine Arts Museum in 2018, examined the intersection of games with other fields like art, education, and healthcare [174]. These exhibits reflect a gradual development in examining video games from their historical progression and value as an artistic medium to their role in creative communities and cross-disciplinary interactions.

---

[50] Han Yajuan is a Chinese artist, explores the interaction between women and systematic environments regarding agency, with notable works such as Cyber JiangHu (2020) [165].
[51] Ian Cheng (b. 1984), an American contemporary artist, creates live-simulated digital "virtual ecosystems," focusing on living agents' adaptability to change, exemplified in works like Emissaries.
[52] Jacolby Satterwhite (b. 1986), an American artist, blends performance, digital animation, and ephemera in installations and works influenced by art history, cinema, and pop culture, with notable pieces like Pygmalion's Ugly Season (2022) [166].
[53] Keiken is an artist group established in 2015 by Hana Omori, Tanya Cruz, and Isabel Ramos. They explore future possibilities through diverse media and innovative collaborations, with notable works like Wisdoms for Love 3.0 [167].
[54] Pete Jiadong Qiang (b. 1991), a UK-based artist and architect, explores the intersection of architecture and pictorial space through hyperization and gamification. Known for architectural maximalism, he collaborates with the art duo Hyperbation. His notable work is HyperBody.
[55]Lawrence Lek (b. 1982), a filmmaker, musician, and artist, blends architecture, gaming, and fiction to explore the myth of technological advancement. Notable work: 2065.
[56]Lu Yang (b. 1984), a Chinese artist, merges medicine, spirituality, and digital culture, using video and performance to explore gender fluidity and neurology with a contemporary Chinese vision. Notable work: Doku: Digital Alaya [171].

In recent years, the exploration of the relationship between video games and art has moved towards more nuanced aspects, such as “WORLDBUILDING,” curated by Hans Ulrich Obrist, held at the Julia Stoschek Foundation in 2022, focused on the interaction between artists and video games and explored how to transform this interaction into an art form [175]. These explorations demonstrate that the initial question of whether video games are art has shifted towards examining the relationship from a more profound and specific perspective. Meanwhile, art and video games’ interplay is also mirrored in the gaming industry; for instance, Anna Anthropy advocates games as a medium with “cultural and artistic value” through her lectures and publications [164], and Ye Zitao[57] hosts the diverse discussions in his podcast “Sunset Room”[176].

Academic Endeavors

The academic world has long endeavoured to understand the relationship between games, art, and culture. As early as 1938, Dutch scholar Johan Huizinga in “Homo Ludens” considered “play” in games as foundational to culture [177]. Later, Marshall McLuhan described games as a form of popular art [178], and by 2002, Henry Jenkins and Kurt Squire defined computer games as art with “contested spaces” [179]. Over time, academic discussions have evolved from the broad concept of “play” in games [180] to more specific game categories, shifting focus from whether video games can be considered art [179], [181], [182] to more specific topics, such as what makes a video game an art piece [183], [184], game exhibitions in artistic contexts, or gamified art exhibitions [185]-[189], games’ art elements [178], and art within games [190], as well as discussions of their relationship in a broader socio-cultural context [191]. Numerous academic concepts have emerged, providing diverse perspectives on understanding the relationship between games and art.

Terminology Evolution

In terms of terminology, the academic world has created many terms to describe the relationship between games and art, for example, art game[192], [193], artgame [194], [195], Art Game[193],

[57] YE Zitao is a Chinese game designer, writer, and translator. He works at Tencent NExT Studios in Shanghai for creative game incubation.

game art [194], Game Art [193], videogame art [178], Video games as art [193], Art as a game [193], Art Video Games [191], artist game, artist's game, Game Artist, and game artist. These concepts appeared in different periods and have their scope and referents, leading to common misuse and confusion sometimes. For instance, the concept of art game was initially proposed in 2003 by new media artist Tiffany Holmes as the interactive works by visual artists [192]. However, at the same time, the artist and curator Rebecca Cannon further clarified game attributes in art game, emphasising interaction and competition as critical elements for this concept [193]. In 2005, indie game designer Jason Rohrer introduced artgame, associating video games with art films and music [194]. After that, Matteo Bittanti introduced the term Game Art in 2006, describing artworks where video games play a vital role in artistic creation [193]. A year later, Andy Clarke and Grethe Mitchell further narrowed the discussion to the field of "videogame art" [178].

More recently, in 2015, John Sharp further explored these existing concepts; on the one hand, he continued Jason Rohrer's game-centric approach and defined artgame as video games that create and reveal reflective experiences about life and human nature, like "Braid"[58] [194], on the other hand, influenced by Nicolas Bourriaud's "postproduction"[59] aesthetic, he clarified game art as art made using game production or artworks about games, such as Julian Oliver and Cory Arcangel's creations [194]. Therefore, although the current academic field has yet to form a unified terminology system to describe the practice in the hybrid area of video games and art, as well as the relationship between them, it can probably be assumed that in contemporary academic discussions, "art game" ("artgame"/"art game") could be regarded as emphasising more of the nature of video games, while "game art" ("game art"/"Game Art") is more common see in artistic contexts.

The Evolution of Artists' Strategies for Interacting with Video Games

[58] Braid, developed by Jonathan Blow, is an indie puzzle-platform game, initially released in 2008, notable for its time-reversing gameplay and philosophical narrative.
[59] Nicolas Bourriaud, born in 1965, is a French writer, curator, and theorist. His postproduction concept articulates how artists have increasingly crafted new artworks by reinterpreting, reproducing, and remixing existing works and cultural products since the early nineties as a creative response to the overwhelming abundance and diversity of global culture in the information age.

In 2007, Axel Stockburger, in Videogames and Art, stateed three interaction strategies between video games and modern art: “Appropriation,” “modification,” and “artist games” [178, p.37]. “Appropriation” refers to the use of elements (including graphical and technical) from popular computer game culture, transforming these objects into art by placing them in an artistic context [178]; “modification” involves altering the functions or aesthetic elements of existing games to create art, such as making game patches, designing new looks for game characters, or changing game environments. This strategy requires an in-depth understanding of the game’s systems, rules, and community. “Artist games” refers to creating unique and innovative games by artists, many of which are playable online [178]. Then, in 2022, Hans Ulrich Obrist, in the “WORLDBUILDING: Digital Era Games and Art” exhibition, responded and extended these strategies [175], [196]. Obrist’s observation that artists draw inspiration from the aesthetics of video games and integrate them into their artworks [175] can be seen as a response to the strategy of “appropriation.” He mentioned that artists delve into video games to undertake projects [175], which can be considered as an extension of the “modification” strategy. Finally, Obrist highlights a growing trend where increasing numbers of artists develop their own games [175], reflecting a shift towards more personal and direct engagement with the medium.

2.2.3.2 Creators in GameArt Practice

The current field of GameArt has seen the emergence of numerous prominent creators, such as Ian Cheng, Lawrence Lek, Pete Jiadong Qiang, Keiken, Rebecca Allen[60], Theo Triantafyllidis[61], and Jacolby Satterwhite. Feminist principles are notable in works by Angela Washko, Lena NW, and Anna Anthropy. In China, there also are many artists have been engaging in the intersection of

[60] Rebecca Allen focuses on motion aesthetics, perception, and advanced technology, with works in video, performances, and virtual reality, exploring future human identity and nature [197].
[61] Theo Triantafyllidis (b. 1988), a Greek artist, creates virtual spaces merging the virtual and physical in uncanny ways, often through performances, VR experiences, and interactive installations, focusing on computational humor and AI improvisation [198].

video games and art, for example Feng Mengbo[62], Fei Jun[63], Cao Fei[64], Han Yajuan, and Lu Yang. Many of these artists' practices in China still operate within the frameworks of "appropriation" and "modification", which are not really the GameArt practices this study focused on and are also less associated with feminist principles. However, their creative practices reveal the development of game-art crossover in China, providing a research context for this study.

2.2.3.3 Case Study of GameArt Associated with Techno-femnist Principles

Angela Washko

Angela Washko is an American artist, writer, and facilitator who contributes to creating "new forums for discussions of feminism in the spaces most hostile toward it" [157]. Her notable work, "The Game: The Game" (2018), was developed with game engines, as shown in Fig. 3 [199]. It critically examines the pickup artist (PUA) community through a role-playing game format that employs a first-person perspective (1PP). This 1PP places participants in a woman's shoes to navigate the complex social dynamics of dating scenarios dominated by PUA, which delves into interactions between genders and feminist issues within a gaming context.

[62] Feng Mengbo (1966) is one of the earliest Chinese creators to use games as an art medium. His work "Long March: Restart" (2008) combines political influential Chinese popular culture with Western iconography [200], [201].

[63] Fei Jun (b. 1970), a Chinese contemporary artist and designer, created A Funny World, a mobile app that lets users create their "funny world" with limited resources and exchange with others via game rules.

[64] Cao Fei (b. 1978), a Chinese artist. She often merges societal critique with mainstream aesthetics in her films and installations. Her RMB CITY project [202] on Second Life (2008-2011) explored virtual and real-world dynamics.

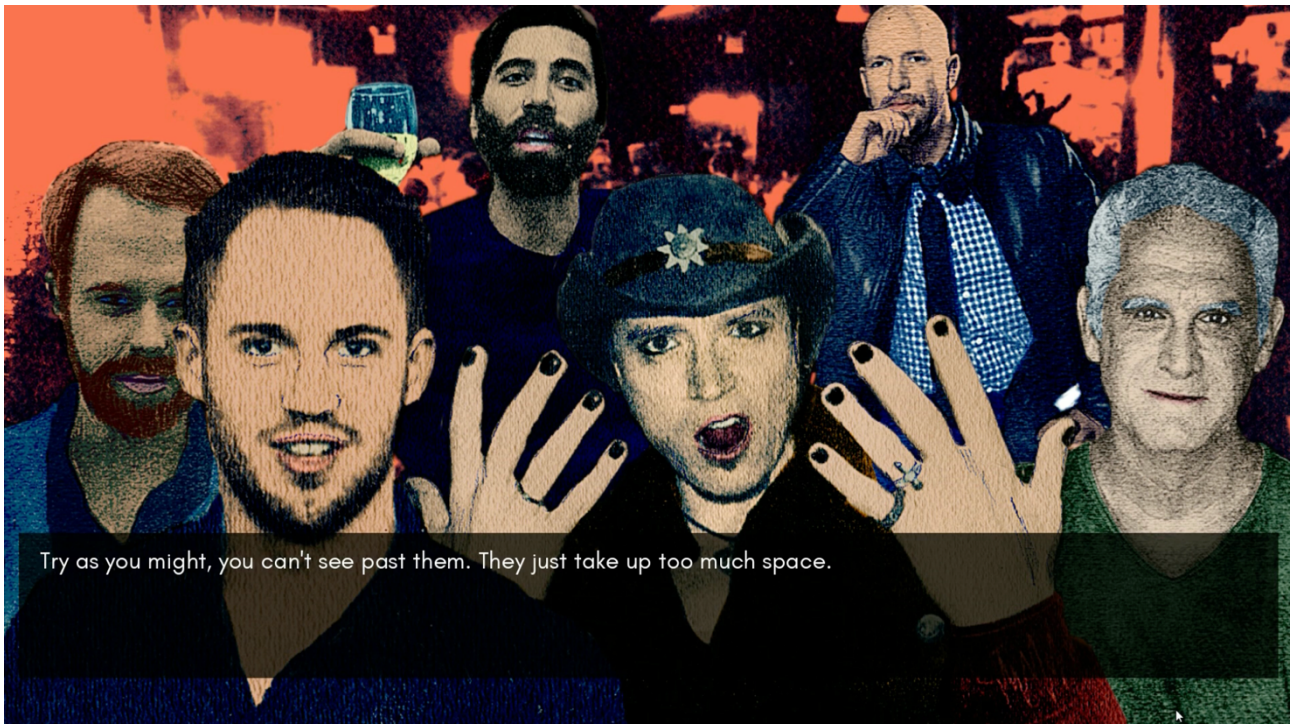

Fig. 3. Screenshot of “The Game, The Game” gameplay video, created by Angela Washko, 2018, accessed March 7, 2021. Available: https://angelawashko.com/artwork/4480845-The%20Game%3a%20The%20Game%20%28gameplay%20video%29.html

Washko’s project emerged from her deep dive into the ideologies and methods of prominent PUA, using various approaches such as extensive research, interviews, and documentation to capture their techniques and dialogues verbatim for establishing speculations about extreme male-female social interactions. Through exhibitions and local host downloads, participants navigate as a femme-presenting character in simulated dating scenarios, confronting PUA who employ their distinctive seduction strategies. This setup allows for a firsthand understanding of the “dangerous terrain” [157] where the complexities and manipulative tactics embedded within pickup culture, fostering critical reflection on gender dynamics and consent.

Washko’s approach to creating this work involved engaging with controversial figures and their followers, adding authenticity and depth to the player’s experience, and sparking essential conversations on consent and women’s experiences in dating scenarios. The work reflects the social interaction between females and males concerning dating and reveals the approach of delivering feminism through GameArt experience.

Her practice exemplifies how GameArt practice can be employed to dissect and critique gender dynamics, showcasing the complicated ongoing process behind the practice, and offering a platform for reflection and discussion on women's experiences and agency. Her approach to using the languages and technologies of video games and art as a means of feminist activism highlights the potential of GameArt practice to contribute to techno-feminist discourse and challenge patriarchal structures.

Lena NW

Lena NW is an animator, illustrator, rapper, and game developer [168]. Her GameArt practice presents a unique intersection of digital culture and GameArt practice through her creations.

Her work "Nightmare Temptation Academy" (2020) as illustrated in Fig. 4 [203], is a dating-simulation/roleplaying game/music experience [170] built with a game engine and set in a high school at the brink of an alternative world's end, immersing participants in the role of a 14-year-old girl. It navigates them through a labyrinth of controversial topics, including suicide, sexual abuse, pornographic art, and feminism, framed within the gameplay events [169], [204], co-forming perceptions of millennial adolescent emotional apathy and confusion under internet addiction and media overexposure [170].

Fig. 4. Screenshot from “Nightmare Temptation Academy” by Lena NW, 2012, accessed May 7, 2021. Available: https://www.lenanw.com/nightmaretemptationacademy

Lena NW’s work challenges participants by restricting their freedom within the game, suggesting a critique of the passive acceptance of identity in the digital age. Moreover, her ability to single-handedly craft the work’s visuals and soundtrack allows for a deeply personal and unified artistic vision. This holistic approach to GameArt practice ensures that every element, from visual aesthetics to auditory experiences, resonates with her unique perspective on digital culture, adolescence, and the internet’s impact on identity formation.

Lena NW’s GameArt practice engages with techno-feminism not only by addressing taboo subjects through a game format but also her work demonstrates how video games, visual art and music languages and technologies can be employed to explore and critique cultural and social issues, which is aligning with techno-feminist efforts to use technology as a mean for societal change.

Anna Anthropy

Anna Anthropy is an American game developer, author and educator [162]. She promotes video games as a medium with “cultural and artistic value” through games, books, lectures and talks

[164], aiming to encourage people to create video games that represent a more comprehensive human experience.

Her work Dys4ia [161], as shown in Fig. 5 [205], is an autobiographical interactive experience that reflects six months of her journey through gender dysphoria and hormone replacement therapy [163], [206], utilising simple gameplay mechanics and a series of mini-games to convey complex emotions and experiences associated with transitioning. Anthropy's choice of a classic 8-bit style and vibrant colour scheme further enhances the narrative, not only drawing participants into her world and facilitating a deeper understanding of transgender issues through interactive media but also allowing them to co-shaping the construction of gender politics and identity issues [161].

Fig. 5. Screenshot of "Dys4ia" by Anna Anthropy, hosted on freegames.org, accessed May 30, 2021. Available: https://freegames.org/dys4ia/

Her work Queers in Love at the End of the World [207] is also unique. It is a twine-based interactive fiction that challenges players to decide how they would spend their final moments with a partner before the end of the world [207]. This work notable for its short, ten-second gameplay, emphasises the intensity and significance of queer love under the looming spectre of finality. It invites participants to reflect on their choices in the face of apocalypse, underscoring the ephemeral nature of existence and the enduring power of emotional connection.

Anna Anthropy leverages her unique aesthetic and skills to redefine the potential of video games as a medium for profound personal expression and social critique. Her GameArt practice aligns with techno-feminism by challenging traditional narratives and representations within video games,

embodying techno-feminist ideals by leveraging technology to question societal norms and promote gender inclusivity.

2.2.3.4 Highbrow VS. Lowbrow

In China, the fusion of video games and art has been relatively slow. This is mainly due to the significant professional thresholds between video games and art in China, along with the public's divided stereotypical perceptions of video games and art, create gaps between these two domains [23], [24]. On the one hand, the professional threshold is a crucial reason for slowing down the integration of video games and art. In China, students used to choose between Humanities or Science in high school, which means that the gap between art and computing - arts and science – two "distinct" educational orientations- are divided from high school onwards and study separate subjects. The situation was not changed until the college entrance examination reform in 2015 [213]. Students received different training and knowledge in these two "diverse" educational backgrounds. Moreover, they are regarded as two groups with completely different thinking processes, capabilities, and behaviours. This creates high barriers for artists or game developers with single-domain expertise to engage in interdisciplinary creation, impacting GameArt exploration and development in China.

On the other hand, although the video game and its technologoes play a unique role in national economic and technological revival in China, video games are often positioned as a form of lowbrow culture with strict control and guidance [86]-[88]. In the mass media, the video game has negative media portrayals, such as "spiritual opium," and it is a source to create harmful influence on youth development [208]. Conversely, art is seen as "noble" domain and linked to national prosperity and cultural development [209], [210]. For example, the state relates art to improve "Su Zhi" [40] and connected aesthetic education to civic quality, national enrichment, and the construction of a national culture [211]. Despite some scholars advocating for video games as an art form in China [212], they are still be viewed distinctly by the public.

2.2.3.5 Workshop as a Practice

In contemporary art history, many artists and movements have emphasised the process of art creation, interaction, and practice through workshops. For instance, the Fluxus movement of the 1960s emphasised process over product, blurring the lines between art and everyday life and advocating public participation [214]. Key artist Joseph Beuys valued social engagement [215], viewing artistic expression as a political endeavour. He combined lectures, performances, and workshops to encourage public art participation, creating new possibilities for artist-community interaction. He also introduces the concept of "Social Sculpture," a way to "mould and shape the world in which we live" [216], implying that through creative actions and thoughts, people can positively impact society.

Similarly, Yoko Ono used the concept of "Instructional Art" to consist of a series of art pieces providing simple instructions or suggestions for the audience to execute or imagine, thus completing the artistic act. Her approach challenges traditional relationships between viewers and artworks and emphasises audience participation [217], [218]. Moreover, Tania Bruguera's[65] "arte útil" [66] emphasises art serving social change, using interactive works to provoke deep reflection and response from audiences [219]. These practices highlight the process, interaction, and close relationship with the public in art, providing rich references for this study's art workshops.

2.3. Virtual Reality (VR), Mirrors, and Self-Perception

2.3.1 Virtual Reality (VR)

2.3.1.1 VR as a Research Tool

VR is a technology and set of devices capable of creating immersive experiences for participants, proven valuable as a powerful tool across various fields, offering exceptional support in education, training, therapy, surgery, learning, entertainment, and psychology [220-[225]. It also serves as a

[65] Tania Bruguera (b.1968), a Cuban performance artist, primarily explores themes of power, identity, and authority in her works.
[66] Arte Útil, translating to 'useful art' in English, implies art as more than just useful—it envisions art as a tool or device. This concept utilises artistic thought to devise and implement tactics that alter societal behaviour [219].

research tool, improving methodological issues in previous studies [226]. Immersive Virtual environments (IVEs) are synthetic sensory information (e.g., visual, haptic, auditory, olfactory, gustatory, thermal or combinations of these senses) created in software, in which individuals are surrounded by continuous stimulation and generally allowed to interact [226], creating illusions such as “presence” [225], [227], [228] and body ownership [222], [225], leading to incline the participant to respond to virtual situations and events realistically [227]-[229]. IVEs’ immersion is supported by VR technology [228], the more advanced the system, the higher the immersion [221]. Current research on VR in gaming focuses on benefits like realism, immersion [230], [231], data collection [232], enhanced emotional experiences [233], and psychological [234] and emotional impact [235], with some studies exploring three spatial sub-dimensions of cognitive abilities in VR games [236].

2.3.1.2 Presence

The illusion of presence in IVEs is essentially a psychological function representing the degree to which the individual experiences the virtual environment [237]. Mel Slater proposes “Place Illusion” (PI) [67] and “Plausibility” (Psi)[68] as terminologies refer in particular to the illusion of presence in IVEs and reveals that PI and Pis may cause participants in IVEs to respond to events and situations realistically [228]. Moreover, Psi can happen without requiring physical realism [228]. [237] and [238] further investigate the elements influencing the sense of presence from the perspectives of the VR system and performance. [239] argues that the virtual body participant embodied is a vital cause factor for the sense of presence in IVEs [239].

2.3.1.3 Body Ownership

Numerous studies reveal that body ownership illustrates the flexibility of mental representations of the human body and identity in IVEs [240]-[242]. Body ownership indicates the feeling that an unrelated body part is part of one’s own body or that the whole body is one’s own body [222].

---

[67] Place Illusion (PI) is the concept Mel Slater proposed to replace presence in the existing literature, which refers explicitly to “the being here” in IVEs [228].

[68] Plausibility (Psi) refers to the illusion of a convincing impression that an unfolding event is genuinely occurring despite a clear understanding of the contrary [228].

Since the Rubber Hand Illusion (RHI) proposed by Botvinick and Cohen [243], there has been increasing evidence that VR technologies can be used to create a strong illusion of ownership of the virtual body. For example, the illusion of body distortion, such as a third arm [244], a longer arm [246], [245], a tail [247], the out-of-body experience [248], [249], the whole-body illusion caused by manipulation of visual perspective [241], and the body ownership specifically concerning facial features [250]. Meanwhile, high levels of body ownership have also been demonstrated in experiments with non-humanoid virtual bodies, such as a purple virtual body [251], a cartoon rabbit [252], an alien object [253], a cow [254], or a robot [255]. Moreover, multiple methods successfully induce a sense of body ownership for different races [251], [256]-[259], ages [260], gender [220], and body sizes as children [260] or adults [261]. VR demonstrates and expands “human-like flexibility” [262]. Therefore, there is enormous potential for adopting devise representations of virtual bodies to induce participants’ illusion of body ownership in IVEs.

Also, many studies exploring factors influencing body ownership in IVEs have found that the visual realism of physical appearances and virtual environments doesn’t significantly contribute to inducing illusions [241], [244], [257], [263]. The synchronisation of visual motion can lead to whole body ownership illusions without needing additional visual stimuli [264]. Factors like gender identity [241] and existing implicit out-group biases [258] are not deemed crucial. Typically, multisensory correlations are effective in inducing illusory ownership of a virtual body [240], [251]. Personalised virtual avatars are known to enhance participant identification and increase gaming enjoyment [265], while studies also emphasise the importance of the first-person perspective (1PP) [223] and visual senses [266].

The illusory body ownership in diverse representations of virtual bodies might lead to the participant’s perception changes in IVEs. As body ownership is part of the issue of self-perception [267]-[270], existing studies reveal that participants in IVEs experience illusions of body ownership with different virtual bodies, it can impact their cognition, attitudes, behaviours and self-identity [222], [240], [244], [246], [252], [256], [261], [271], and even potentially leading to behavioural characteristics that align with their virtual bodies [257]. This phenomenon is termed the “Proteus

effect"[69] by Yee Nick and Jeremy Bailenson from a social-psychological perspective in 2007 [239]. Moreover, substantial empirical evidence from cognitive neuroscience and multisensory integration supports this viewpoint. For example, adults embodying child avatars identify more with childlike traits [260]; taller avatars boost participant's negotiation confidence [239]; embodying famous figures like Einstein improves performance [271], [272]; and embodying Caucasians in dark-skinned virtual bodies may reduce their Implicit Racial Bias [257]. Notably, these cognitive and behavioural changes may persist even after virtual stimuli cease [273], which indicates how virtual body ownership can influence participants' cognition, cause perception changes, and potentially carry over into real-life situations.

2.3.1.4 Social Ethics and the "Empathy Machine"

In the VR field, on the one hand, research related to social ethics is growing, addressing cognitive biases towards specific social groups [251], [259], stereotypes and prejudices impacting the elderly [239], [271], and racial biases [222], [240], [251], [257], [274]. Studies show that bodily representations causally influence social cognitive processing [275], and virtual body ownership can effectively change biases towards specific groups[225], [259]. On the other hand, VR's role as an "empathy machine"[70] [282] is debated. While neurocognitive-related research provides evidence for empathy [275], [276], others argue that VR experiences are more about direct experience privilege than genuine empathy or validating others' feelings [262], [277], [278]. VR empathy may overlook the limitations or potential of device mediation and perception [262], not necessarily leading to change or prosocial behaviour [279] and might even be a passive [279] "forced" [280] and "toxic empathy" [278], bypassing circumvent cognitive reasoning, discourse, or political deliberation [280], and creating negative impacts. Alternative research approaches and perspectives, for example, the Golden Rule Embodiment Paradigm (GREP) [71] [222], aims to find ways to reduce harmful behaviour [222], [281] with dual experiences seen as key to VR-induced

[69] "The Proteus Effect" refers to the participant's behaviour coordinates with the modified self-representation regardless of the actual physical self after embodying in a virtual body [239].
[70] The term "empathy machine" refers to using technology to process another's emotional experience internally, often aiming to inhabit another's body [282].
[71] The GREP (Golden Rule Embodiment Paradigm) involves participants first engaging in or consenting to actions that harm others and then re-experiencing this harm from the victims' perspectives to comprehend the impact of their actions or inactions.

behavioural changes [222], [228]; Some other researchers suggest viewing empathy as an aesthetic concept rather than a psychological or ethical term [282].

2.3.2 Mirror Stage, Mirror Reflections, and the Self-Perception

2.3.2.1 Jacques Lacan's Mirror Stage

Jacques Lacan's mirror stage theory illustrates how infants between 6 and 18 months first perceive their complete self-image in a mirror. The mirror stage initiates self-consciousness formation though akin to an illusion [283]-[285]. It also lays the foundation for interaction with the Other and is strengthened through engagements with symbolic order, culture, and social norms. Lacan delves into the mirror stage's role in his "triadic structure" of the Imaginary, Symbolic, and Real [285]. The Imaginary involves identity formation and subjectivity; the Symbolic links with language, law, and social norms represent the subject's societal existence; The Real is the realm of that which cannot be fully articulated or understood through the Symbolic or Imagined. The Real is associated with traumatic or unassimilable experiences that cannot be integrated into the symbolic order, leading to profound anxiety [285].

Various feminist theorists respond to Lacan's mirror stage theory. For example, Julia Kristeva critiqued Lacan's emphasis on the symbolic language aspect, highlighting the semiotic as a crucial, feminine language component for challenging male dominance [286]. Jacqueline Rose analysed Lacan's representation of women within male-centric frameworks, focusing on how it affects women's identity and desires [287]. Judith Butler applied Lacan's concepts to gender, arguing for its performative and socially constructed nature while critiquing the binary gender perspective in Lacan's work [288]. Luce Irigaray addressed Lacan's marginalisation of female experiences, calling for a language and symbolic order that values female sexuality and subjectivity [289]. Hélène Cixous contested Lacan's patriarchal symbolic order, urging women to develop their expressive styles [290]. Drawing from Lacan's psychoanalysis and film theory, Laura Mulvey introduced the "male gaze" notion, discussing its role in reinforcing patriarchal structures in cinema [291].

Jacques Lacan's mirror stage theory offers a critical framework for understanding self, identity, and social interactions, and is extensively applied across film, art, and cultural studies [273], [292]-[299]. This theory has also been utilised in video game and VR studies. Examples include examining how playing roles in video games might foster additional personal identity formation [296], the complex mirror stage experience in VR due to the perceived distance between the user and their avatar [297], and the multiplicity of self and its reflections driven by the diversity and malleability of avatars [298]. Further, interactions in VR reflect bodily, social, and cultural dynamics shaped by internet culture's media ideologies [299]; the mirror disrupts virtual immersion, linking the virtual world with real experiences and encouraging reflection on one's identity [295] and the concept of double-mirroring in VR where avatars mirror players' movements, leading players to subconsciously mirror avatar attributes [273]. Additionally, some studies focus on virtual mirrors in VR, showing that humans naturally expect mirrors to reflect their image, facilitating the embodiment process by allowing individuals to associate the reflection of a virtual body with their own [300]. These studies indicate that VR and video games complicate the mirror stage and self-perception, challenging the understanding of self and others while blurring the boundaries between online and offline, real and virtual realms.

Moreover, Lacan's mirror stage theory significantly influenced the Apparatus theory [301], which provides a framework for understanding audience identification with screen images [302]. For instance, Jean-Louis Baudry analysed how cinema affects viewers through technology and narrative [303], Christian Metz studied how films as an apparatus convey meaning [304], and Joan Copjec critiqued Laura Mulvey's theory as a misreading of Lacan's mirror stage [301], [302].

2.3.2.2 The Concept of Apparatus

In addition to the previously mentioned Apparatus theory [301], the concept of "apparatus" is widely utilised in academia. Alan Cholodenko proposed the terminology "animatic apparatus" that has an automaton nature [305, p.11], which bridges the hybrid area between "animism and mechanism, animation and cinema, human and nonhuman" [305, p.16]. In The Animatic Apparatus (2018), Deborah Levitt further reveals the tremendous impact of simulation and animation on the contemporary "neoliberal-biopolitical culture of life," which provides new notions and ethics of

animatic life [307]. The term apparatus has also been applied to serious game studies, developing the notion of “game apparatus” [306]. As animation renders into the centre of contemporary popular culture [308], the distinction between animatic and life has become increasingly blurred because the automated mechanical processes of animation seem to supersede human motion and labour [307], [309], challenging the differentiation between animate and inanimate composites [309]. Therefore, apparatus encompasses traditional media forms and technical means and involves interactions and definitions between life, body, and cognition. As Cholodenko articulates, apparatus is “a third coming between any and every two things, including two opposing poles” [305, p.16].

Furthermore, Karen Barad views apparatus[72] as not only a tool for capturing phenomena but also as an active participant in generating phenomena, determining which elements are included or excluded [136]. This approach encompasses both material elements such as experimental tools or devices and discursive elements, impacting both the material and the cultural/social dimensions [136]. Consequently, Barad emphasises the ethical responsibility of researchers when utilising apparatuses [149].

2.3.2.3 “Reflections” from the “Other” and the “Big Other” in IVEs.

Lacan stated that the Other represents what the subject is not and forms self-consciousness through comparison. The Big Other symbolises societal and cultural norms, influencing our desires and self-perception and setting behavioural standards [285]. The self is formed through interaction with the Other, within relationships and language, while the Big Other, as a system of norms, provides a reference framework for the subject [285]. Due to the often-unattainable demands of the Big Other, the subject’s self-consciousness remains unstable [285]. Lacan’s theory of the Other/Big Other offers a unique framework for understanding the influence of others and social structures on self-perceptions. Theorists like Slavoj Žižek, Luce Irigaray, and Joan Copjec have responded by

[72] Karen Barad’s concept of apparatus is based on Niels Bohr’s idea, which views the experimental apparatus as an embodiment and materialisation of the equipment.

exploring the Big Other's impact on the unconscious from a gender perspective and as a framework in critique of modern subjectivity and power structures [289], [301], [310].

Subjectification contains the experience of objectification [311], [312], becoming an active subject through connection with the symbolic systems of language and meaning [294], that is, forming self-perception through "mirrored" reflections obtained from the Other and the Big Other. Studies on mirror neurons in the brain also show that identity construction occurs within a larger Other group [277]. Specifically, in IVEs, numerous studies indicate that virtual humans, as the "Other," influence the cognition and behaviour of participants [226]. By manipulating the design of virtual humans, not only can social behaviours between participants and virtual humans be induced [313], but also the thinking and decision-making processes of participants can be affected [314] and even generate group pressure [226], [315], leading to herd behaviour [314]. Especially under conditions of multisensory stimulation, there is an increased possibility of influencing participants' social cognitive processes to produce group behaviour [316]. Even the extent of these influences may be limited by "social impact effects"[73] [226], specific social groups [251], [259], [317], representations of the Other [240], [316], and other factors.

2.3.2.4 "Reflections" from the Participant's Avatar in IVEs

Body ownership is critical to connecting the experiencer's self-perception and their embodied avatar in IVEs (see 2.3.1.3); having a sense of embodiment is necessary to be able to form a self-identity with the avatar reflected in the mirror [270]. These embodied "representational" images are comprehended as representative texts to be read by complex systems of symbols and meanings [293], which determine the reception of the image [318]. In other words, becoming "oneself" depends on the encounter with one's "double" [284]. Studies show that high identification with an avatar can positively predict empathy towards it, the Proteus effect, and role-playing motivations, personalisation, and escapism [319], enhancing the experiencers' intrinsic motivation [320]. Moreover, if the "developing subjects" encounter "anxious moments," it may disrupt the comforting illusion of the mirror stage, leading to a rethinking of their subjectivity [284].

[73] Based on the Threshold Model's applicability, effects of social influence emerge when the blend of behavioural authenticity and social presence reaches or exceeds a certain threshold [226].

2.3.2.5 Subject Objectification Created by Third-Person Perspective (3PP).

3PP offers an objective viewpoint of the subject within IVEs. Essentially, 3PP places the experiencer in an active "I" position to control the avatar [321], signifying the avatar's operation as an externalised Lacanian "mirror" [322]. This aligns with the concept of "subject's objectification" extended from Lacan's mirror stage [311], leading to the formation of a projected identity [323]. 3PP is applied in both IVE research and commercial applications, such as explorations of the out-of-body experiences [248], [249], [253], [269] and VRchat[74] [324]. These applications highlight the unique explorations and value of 3PP in IVEs, providing significant insights for specific prototype design.

2.3.2.6 Selfies and Beauty Filters

The selfie is a mirrored image in the digital age, while the beauty filter encodes imagery of the ideal self [514]. The selfie is a unique type of traditional self-portrait produced through various media [325]. It has evolved significantly in the digital age. Utilising various media, it has become akin to a mirror, with beauty filters creating images of an "ideal self" that have gained global attention [326]. It has also been incorporated into VR social platforms, such as VRChat, to create more engaging interactions and enrich the user experience [324]. With an increasing number of studies investigating the role of gender and feminism in selfie culture [325], [327], [328] research indicates a higher tendency among women to take and share filtered photographs [329]. Moreover, the "self-imaging practice" [325] often involves aesthetic and emotional labour, where beauty filters act as an extraordinary neoliberal technique tool providing "scientific" assessments and "help" [328], as well as an essential regulatory role, thereby enforcing normative standards [327], combining "algorithms through filters" to encode heteronormative and racialised principles [328] and promote stereotypical or normative portrayals of women, leading to unrealistic expectations of appearance

[74] VRchat is a VR social platform, allowing users to switch between 1PP and 3PP. It also has selfie functions, where the image of user's avatar can be seen from four angles: front, back, left and right [324].

[330]. The digital forensic gaze[75] on social media [327] and the prevalent body comparison [330] amplify the tension between authenticity and technological manipulation [325], [327], contributing to the rise in selfie editing [330].

Filtered selfies do not inherently lead to women's empowerment. Research suggests that while users may become more reflective about their online self-presentation and self-objectification through selfie practices, this does not necessarily translate into empowerment [325]. Beauty editing apps, in fact, represent a form of intense regulation and scrutiny over women [328], [330]. From a feminist and Foucauldian perspective, the selfie can be seen as a form of digital self-surveillance [328]. Far from alleviating appearance-related anxieties or fostering empowerment, they may aggravate crises over appearance and dependency on external validation [331], and even increase interest in cosmetic surgery [330].

2.3.2.7 Other "Mirror Reflections" Generated by New Technologies.

The non-mirror-generated reflections, facilitated by new technologies, present a new image of the "body." Research such as [293] explores interactive mirrors in artistic, shopping, and medical scenarios, offering an alternative understanding of imagery through interaction, intensity, and virtual concepts. Because of the high psychological flexibility of participants towards avatars in virtual reality (VR) environments [240]-[241], with motion-visual synchronisation, a sense of body ownership can be generated even without additional visual stimuli [264]. This approach of producing reflections using non-traditional forms of mirrored media offers novel ideas for the prototype design.

[75] A digital forensic gaze is a customary practice for examining selfies, which means it is often assumed that a filter is used when viewing selfies. Decoding authenticity is necessary to drive the selfie[327].

2.4 Crucial Elements in the VR GameArt Prototype Design

2.4.1 Narrative

2.4.1.1 The Bidirectionality of Narrative in Video Games, and Methods of Narrative Unfolding.

Narrative in games exhibits bidirectionality. Although narrative remains a contentious topic in game studies [332], [333], it is considered a concept linked to self-construction in humanities [334] as a crucial method for perceiving and interpreting self-identity and history [335]. Current research indicates that, on the one hand, game narratives play an important role in shaping personal and cultural identities [336], with different narrative methods affecting gamers in various ways [337]. On the other hand, games, as structural systems of existence and events (a form of spatial narrative), allow participants to co-create narratives through designed experiences [338], which means that game narrative is also a process of the participant's experience of self [335], requiring their understanding and interactions with the physical and mental aspects within the game environment [339]. The degree to which participants can control and influence events also determines the narrative's realism to them [340]. Therefore, game narratives are co-constructed by developers and participants [338], where the developer's design and the level of openness given to the participant influence the openness of the shared narrative, and the participant's involvement deconstructs and reconstructs the game's narrative while continuously forming and shaping their self-identity within the game, which provides an essential reference for the design of the narrative in the prototype.

Narrative unfolding in game design varies, with narrators[76] often being central. Studies have explored the concept of "narrator-as-character" in games [341], similar to their roles in literature and cinema. Additionally, research on "non-personified entities"[77] [342] highlights the contribution of visual, auditory, and interactive elements — unique to game language — in shaping narratives.

[76] The term "Narrator" is borrowed from literature and film, and currently, there is relatively less consensus on the term "narrator" in game studies [341].
[77] "Non-personified entity" refers to the visual, auditory, and interactive (gameplay) methods of games that play a role in the narration.

The relationship between narrators and narratives is another focal point. For instance, an analysis of The Stanley Parable illustrates how its narrator influences the storyline by questioning and challenging player choices, effectively transforming traditional concepts into the author's distinct aesthetic tools and categories [341]. Other studies investigate how "non-personified entities" establish "unreliable narratives," using techniques like inconsistent audio-visual cues, metalepsis[78], and contradictions that undermine player control, prompting players to question the relevance and impact of their actions [342]. Furthermore, research delves into how players perceive their self-identity in narratives with multiple narrators in one game [277].

2.4.1.2 Female-focused Narratives in Video Games

Current game culture is predominantly male-centric [343]. Despite patterns of female participation and game design that can be traced back to the earlier stage of gender studies in gaming [11], narratives in mainstream games are frequently male-driven [344]. The presence of females as central characters has not significantly altered the masculine nature of gaming culture [345], often resulting in a lack of distinct female identities within game narratives [14], [346]. Some game genres, particularly the "emergent narratives"[79] in Japanese Otome games [340] and indie games, have made notable progress. For example, Her Story engages players directly in investigating a complex story through the fragmented testimony of a woman, blurring the lines between truth and perception. This interactive approach empowers players to construct their understanding of the narrative, showcasing the multifaceted nature of female experiences and perspectives [347]. Never Alone (also known as "Kisima Ingitchuga") brings innovation to female narration by immersing players in the rich cultural heritage of the Iñupiat, an Alaska Native people, through the eyes of Nuna, a young Iñupiat girl, and her arctic fox friend [348], offering a unique narrative experience that emphasises cooperation, resilience, and the interconnectedness of community, environment, and identity from a distinctly female viewpoint.

[78]"Metalepsis: when the ontological boundary between the reader (in the real world) and the world of the story is breached [342].

[79] Emergent narratives mean an attempt to escape the author's control of the game scene and seek narrative meaning in the complexity of interaction with the game system itself [340].

These games feature narratives driven by female characters, offering layered portrayals of femininity, in-game autonomy for female characters, and creating new realities from a female perspective, thus empowering players to make meaningful choices [346]. Feminist perspectives in gaming are further advanced by Angela Washko's The Game: The Game, Anna Anthropy's Dys4ia and Queers in Love at the End of the World, as well as Lena NW's Nightmare Temptation Academy. While not explicitly related to female narratives, Braid (2008) [349], SKYHILL (2015) [350], The Stanley Parable (2013) [351], and The Beginner's Guide [352] also offer unique narrative innovations worth mentioning in the context of gaming's evolving storytelling techniques.

2.4.1.3 Counterplay

Recent focus in game studies includes counterplay, a complex phenomenon challenging and subverting the dominance of game systems and the gaming culture [353]. There are various forms of counterplay, includes using existing games as a platform for online protest to undermine and mock game conventions, such as Velvet-Strike[80] [354], [355] and OUT: Operation Urban Terrain[81] [356], altering original game settings [322], and "tactical games" [82] aiming to raise awareness of societal issues [357]. Meanwhile, some feminists employ counterplay as a strategy too, for example, undermining masculine game settings by creating patches for Doom that feature androgynous animals or child fantasy characters instead of standard male figures [322], or producing series of videos critiquing gender portrayals like Feminist Frequency[83] [358]. Counterplay could be a valuable investigation point in alternative design considerations and cultural expressions [357], because innovations in game mechanics and play support diversity, yet experiences in virtual environments remain constrained by encoded rules [321], [359], [338]. The co-creativity of game narratives [338] and the deconstruction and reconstruction of game rules are integral to crafting personal narratives within gameplay [360]. Moreover, counterplay is considered

[80] Velvet-Strike (2002): an action of stealing the game's graffiti spray to write an anti-war message in a militarised virtual gaming world.
[81] OUT: Operation Urban Terrain: an action of server intervention in an online military simulation game during the 2004 Republican National Convention in New York City.
[82] "Tactical games" developed by individuals, collectives and independent studios seek to raise awareness of social, economic and ecological issues [357].
[83] Feminist Frequency is a continuous series of video analyses delving into gender portrayals, myths, and narratives in mainstream culture media, both created and presented by Anita Sarkeesian.

and comprehended as a practice with its pleasures and justifying [353], with indirect and more personal activities and experiments in specific cultural and social contexts, Lei Tong's painting landscape of the game Player Unknown's Battlegrounds (PUBG) [361], photographer Gareth Damian Martin's in-game photography explorations [362], exemplifying its broad action. Overall, counterplay significantly impacts orientalist, sexist, and militaristic expressions, offering vital references for this study's prototype design to engage participant attitudes [357].

2.4.1.4 Situated Knowledge

Donna Haraway's theory of "situated knowledge" emphasises that all knowledge emerges from specific social and historical contexts, making it inherently "situated" [7], [363]. She challenges the notion of absolute objectivity, advocating for diversity, locality, interactivity, and connectivity. Haraway critiques the traditional scientific approach for overlooking the influence of the knowledge producer's identity, position, and perspective on knowledge itself [363]. Her theory is extensively applied in reflecting upon and analysing modes of knowledge production and exploring approaches to building more inclusive and diverse frameworks of understanding. It is also employed in game studies, considered a potential cognitive approach to overcome entrenched hostility in game research towards marginalised groups such as women [364], which provides critical guidance for designing the "situated" narrative in the prototype, aiming to provoke participants to rethink about fixed concepts and pre-perceptions, and in reflections on this study's results limitations.

2.4.2 The Avatar

2.4.2.1 Avatars' Impacts on Female

The term avatar, derived from Hindu scriptures, signifies "an object of worship and a manifestation of divinity descending to Earth" [365], [366]. In gaming, an avatar represents a digital entity [367], controlled by human players [368]-[370], facilitating immersive "realistic" interactions within a simulated environment [371]. This digital representation extends the player's agency and identity into the virtual game space [366]. According to [366], there are four types of relationships between players and their avatars into four types: "avatar as Object" [372], "avatar as Me" [373], "avatar as

Symbiote" [339], [374], and "avatar as Other" [366]. The nature of the player-avatar relationship not only shapes gameplay but is also shaped by the gameplay experience itself [366].

Female characters and representations still largely conform to male-dominated preferences in video games. Numerous studies examining female avatars and agents in games reveal that while the number of playable female characters in video games has increased [336], [375], [376] they predominantly feature as secondary roles [375], [377], [378]. These characters are often overly sexualised [375]-[379], [502], depicted as victims or prizes [379], contribute less than their male counterparts [379] and occupy stereotypical gender roles [377]. Despite the popularity of the "Lara Phenomenon" – dominant, capable female characters in games – in recent years [376], these characters are primarily Caucasian [376]; moreover, their portrayal still significantly emphasises sexuality [376], [380]-[382].

Numerous researchers have delved into the impact of sexualised female avatars in video games, particularly concerning self-objectification among women players. Self-objectification implies viewing oneself primarily as an object of sexual value [383], with media playing a crucial role in promoting this perception [384]. Consequently, women often internalise this ideology, judging themselves based on appearance [383]. Draw from with Lacan's concept of "imaginary relations"[84] [284], in gaming environment, a female gamer's identity can be shaped by her connection with her avatar [322], leading to increased self-objectification [383]. Although one recent study claims that exposure to a sexualised avatar does not have a significant effect on self-objectification [385]. More studies indicate that avatar representation can alter user cognitions and behaviours [239], [386], and "the Proteus Effect" in IVEs aslo suggests that participants may adopt cognitions aligned with their avatar [239], [387]. This effect can lead to transformations in self-perception both in online and offline contexts [239], [383], [388]. Playing as sexualised female avatars has been linked to reduced self-efficacy in women [380] and can influence gender attitudes towards themselves and others [381], [383], [384], [387]-[379]. It may also increase acceptance of "rape myths"[85] [381], [383], [390], posing a risk of developing negative attitudes beyond the virtual world

[84] Imaginary relations: a relationship based on the identification with the image.
[85] Rape myth acceptance refers to incorrect beliefs about rape that blame the victim [383].

[383], [384], [390]. In contrast, fewer negative impacts are witnessed in women embodied in an avatar that is against expectations and breaks stereotypes [390]. Therefore, the sexualised avatar may at least facilitate self-objectification [383].

Additionally, some studies have examined the influencing factors when female gamers could choose or create their avatars. These studies demonstrate that social norms emerging in virtual spaces [391], along with the socio-cultural context, lead many participants to seek socially acceptable appearances [323]. For instance, in Second Life, users often strategically create their avatars based on Western beauty ideals [392].

2.4.2.2 Female Portrayal in Chinese Media and Video Games

Rooted in Confucian culture and shaped by authority, patriarchy, and family expectations [393], [394], the portrayal of Chinese women in media has evolved with mainstream ideologies through social changes [43], [395]. Women were absent in media in the early twentieth century and all character in films were played by men [396], and then there was a tendency to “Europeanise” in the 1920s [397], [398]. They were depicted as victims during national liberation [398] and as “Iron Lady”[86] during the Maoist era [394]. At the beginning of China’s economic reform, women’s image embraced pluralism [399] but was often associated with sex and desire [400]. Then, with the deepening of reforming the economy, it evolved into the “neoliberal” consumer often associated with a high "Su Zhi" middle-class lifestyle, or recently, “spendthrift chicks” [38] that advancing rediscovering femininity via consumer practices [38], [39].

Currently, the ideal female image has shifted from “icons of production” to “icons of consumption”[87] [401], fusing traditional virtues like obedience and nurturing with modern standards of physical attractiveness and affluence [393], [402]. This transformation aims to boost consumption and economic growth [43], [44]. Simultaneously, the portrayal of women in media has gradually internalised as the standard that women themselves aspire to [402]. Contemporary aesthetic

[86] Iron Lady: a portrayal of women represents the masculine revolutionary without femininity.
[87] “Icons of production” refers to production workers, politicians, and scientists. “Icons of consumption” refers to all kinds of stars and celebrities.

preferences for female themselves usually include features like double eyelids, large eyes, straight and high noses, seed-shaped faces, fair skin, youth, slimness, and tall [393], [402], [403], [514]. Research indicates that women who conform to these standards indeed experience improvements in their real-life conditions, with beauty effectively becoming a form of “currency” in certain contexts [403], [404]. This trend may escalate the pursuit of ideal beauty, leading to increased self-objectification and body surveillance among Chinese women. Overall, the portrayal of Chinese women in media has been influenced by traditional norms and societal transformation.

The female characters in Chinese video games, despite their diversity, often remain confined within a male-centric narrative framework. This contrasts with many mainstream video games in the West, where female characters were either absent [378] or portrayed in sexualised and secondary roles [375]. Chinese video games exhibit more diversity in female characters, yet these characters with varied personalities still primarily function within narratives led by male protagonists, often existing to enhance and heroise the male characters [405]. Visually, these female characters typically embody cuteness, aligning with Chinese cultural expectations, particularly those of martial arts culture [406]. Some scholar categise present women characters in four styles: Realistic martial arts[88], cartoon influenced by Japanese and Korean aesthetics[89], and a Western magical cartoon style mixed with fantastical elements[90]. In FTGames, the principal female characters are generally portrayed as adorable, naive, forgiving, and submissive, with a noticeable absence of aggressive traits [407]. When it comes to players’ characters, particularly in FTGames, these avatars almost invariably feature medium-length brown-black hair and lack distinctive personalities [92].

In summary, the idealised image of women in media often internalises as personal aspirations for women in real life. Similarly, female representations in video games shape players’ self-perception

[88] Realistic martial arts style describes female game characters dressed in realistic military uniforms but styled to create as much femininity as possible.
[89] Cartoon style influenced by Japanese and Korean aesthetics emphasises decorative representation, with a relatively exaggerated proportion of the female figure and elaborate costumes and accessories.
[90] Western magic cartoon style mixed with magic elements highlights the feminine symbolism of the chest, and the feminine features of each ethnic group are also noticeable.

of femininity, with Chinese video games still aligning female characters with traditional values and contemporary societal demands. Research has revealed that when female players engage in games allowing for the customisation of avatars, their choices in appearance often reflect a desire to challenge cultural and social norms [408]. Moreover, the deconstruction of masculine traits within games mirrors feminists' dissatisfaction with the portrayal of female characters in existing games [322]. These findings demonstrate a growing desire and dissatisfaction among women in gaming environments to break cultural and societal norms [322], [408]; however, the legend of driving change and attracting more female players lies in offering diverse characters for women, applying the foundation for a more inclusive gaming culture [345]. Moreover, it implies that creators, whether in game development or using game language and technology for creative expression, need to take action from the design stage. Due to the "fluidity of gender" in IVEs [409] and the impact of avatars on users' cognition, VR offers rich design elements and profound immersive experiences that may amplify the potential to challenge stereotypical gender and identity perceptions.

2.4.3 Other Vital Impacting Factors on Perceptions in Gaming IVEs

2.4.3.1 The Agent

Agents, virtual entities controlled by computers, significantly influence participants [368]-[370]. These digital representations, whose behaviours are governed by computational algorithms, aim to achieve specific objectives [367]. Agents' gender, age, and personality are conveyed through visual, auditory, and motion settings in Immersive Virtual Environments (IVEs) [410]-[412]. In video games, narrators and Non-Playable Characters (NPCs) often serve as agents. Studies in various contexts—learning, commercial applications, and consulting services—examine participants' interactions with agents [413]-[416], [485], [489]. These agents can physiologically stimulate experiencers and promote social interactions [224], [313], [417], influencing participants, particularly when humanoid agents feature human-like voices and expressions, enhancing trust [419], [418]. Additionally, agents can trigger herd behaviour and other psychological effects [251], [260], [314]. Users prefer interacting with agents in specific scenarios, such as health checks [420].

Overall, agents can influence participants significantly, which indicates that, given appropriate social cues, users might be inherently prepared to respond to computer-controlled entities as they would to human-controlled ones [370]. Deborah Levitt's work on the animatic apparatus also underscores the emergence of new life forms in digital environments [307].

The concept of the Uncanny Valley, introduced by Masahiro Mori in 1970, is a significant focus in virtual human[91] research. This theory describes the non-linear relationship between the humanoid appearance of robots or virtual characters and human responses[421], [422]. While some scholars associate the reason to arouse the uncanny valley effect with category uncertainty and inconsistencies in realism [421]-[424], others dispute these as primary factors [425], suggesting alternative causes like "Threat avoidance," "Shared circuits for empathy," and "Evolutionary aesthetics" [426]. Some research even extends beyond causation, delving into character representation, dynamics, interactivity, and physiological responses [413], [417], [420], [421], [427]-[431], [425], exhibiting mixed results regarding the uncanny valley effect. One perspective is that in human perceptual systems, images are often seen as reference points [428], especially considering that humans have not co-evolved with animated characters or robots [426], which means that the discomfort from artificial life forms is not solely based on appearance but also represents challenges to creator uniqueness and mortality anxieties [426].

Research on the Uncanny Valley effect offers crucial insights for designing characters in IVEs. Although photorealism and rendered realism's impacts on perceived trustworthiness appear minimal [427], [313], and some studies suggest that motion does not necessarily enhance a character's friendliness [427], critical aspects like eye size [421], [426], [429], facial and body proportions [426], [432], skin realism [425]-[427], and polygon count [426] can still influence participants' perceptions of virtual characters. Smooth, realistic movements [224] and voice modulation [424] can increase believability. Moreover, virtual cartoon characters often gain higher trust and acceptance, making motion anomalies more tolerable [427]. Character design should consider cultural and individual differences and the specific use context.

[91] Virtual humans include agents controlled by computer as well as virtual entities controlled by humans.

2.4.3.2 Aesthetics

The literature review on the aesthetic primarily encompasses elements related to women that maintain societal gender significance.

Cute

The word kawaii is from Japanese, usually translated into English as cute [433], [434], and into Chinese as Ke Ai (可爱). Kawaii is used to describe small and helpless entities [435], implies a social dependence related to “amae”[92] [433], [436], and is associated with the need to escape reality and nostalgia for freedom of childhood [434]. As a globalised cross-boundary cultural method of East Asian [432]-[434], [437], Kawaii- Asian cute- incorporates with American digital entertainment and Asian urbanised culture creates a lowbrow aesthetic expression [433] and a shared popular culture closely tangled to consumerism [432], [437] through video games culture and comics. It has had a significant impact on contemporary Chinese youth culture.

The nature of cute is culturally determined [436]. In China, kawaii is mapped to the Chinese word “Ke Ai,” which initially refers to worthy of being loved； likeable and cute are its extended modern meanings. The introduction of the meaning of cute to “Ke Ai” might especially be associated with Kawaii culture. Moreover, the “minor aesthetic concept that is fundamentally about minorness” [435] is enhanced in forming the new semantics. Specifically, it implies ordinary people’s “superficial” and “minor” narratives that are not related to livelihoods or politics and usually are associated with gender stereotypes of femininity [438]. Moreover, the cute aesthetic is associated with various negative meanings, such as childishness and vulgarity, which leads to a profound misinterpretation of the cute aesthetic in China.

[92] “Amae” (甘え) is a Japanese term that roughly translates to “indulgence” or “dependence.” It describes a feeling or behaviour of seeking emotional support, affection, or care from others, often with a sense of vulnerability and dependence on their goodwill. It’s a complex concept deeply rooted in Japanese culture and psychology.

Cute is incompatible with the traditional Chinese aesthetic but has become widely favoured by young generations. Some scholars argue that the form of the circle, embodied in the harmony of Taiji and the idea of the unity of heaven and humans, is the fundamental element of the traditional Chinese aesthetic to take the contemporary “cute aesthetic” into its territory [439]. However, on the contrary, the facts is that the younger generation re-interprets “tradition aesthetics” through the cute paradigm, not the other way around. For example, cutely modifying the traditional Chinese costume [440]. Therefore, adopting a cute aesthetic to the “nobel” art paradigm in China implies a counterplay attitude to challenge the traditional aesthetic systems. However, this “active superficiality” has not been “formally authorised”/accepted in the Chinese academic sphere. With the generation’s transformation, the cute aesthetic will become increasingly mainstream, and cute culture contains much more than a “minor” narrative from the beginning.

In interactive systems, cuteness can be displayed in appearance, voice, or speech style through solid colours, softness, shaggy textures, smaller motions, high pitch, baby-like head-to-body proportion, and curved shapes [432]. Some studies claim cuteness has a positive influence [434], [441], and sensing cuteness can enhance fine motor skills and improve perceptual carefulness [434]. Others argue that cute bodies in some romantic games are a programmed enhancement of the human body, an approach to effectively controlling and predetermining the relationship between subject and object, which is deliberately controlled and aligned with commercial demands, and even provokes fetishistic forms of cuteness particularly [442].

Pink

Pink is intensely associated with social stereotypes of gender culture and often implies a sexual hint. It has long been extensively debated and questioned by feminist scholars [443]. Post-feminists indicate that childhood and pink practices vary over time and space [444], producing multiple emotional responses [445]. Pink expands various female-related social meanings, such as The Pink Ribbon [446]. It has also become a politically powerful feminist statement such as PUSSYHAT PROJECT [447] and CODEPINK [448]. In China, the stereotypical image of pink is profound. It represents young girls, cuteness, dreamy, delicate, and romantic qualities, and simultaneously carries pornographic and sexual meanings. Adopting the “techno-pink” – a solid

cultural symbol of gender with controversial interpretations to a male-dominated gaming and coding domain, which may respond both Luce Irigaray's "mimesis"- disrupting the fixed status by exposing the vulnerability of stereotypical identities as politically empowering [449], and Donna Haraway's "SF"[93] as worlding practice [450, p.31].

Bling Bling

Bling is a relatively new word [451], [452], deriving from the imaginary sound light creates when it reflects off a vast diamond [453]. It refers to expensive and flashy clothing or jewellery or a style or materialistic attitude [454]. The term Bling Bling came from hip hop from Cash Money Millionaires' song "Bling Bling" in 1999. Currently, it extends its meaning to "a culture of enormous dreams, the celebration of possibilities, or coming into money and stature [453]. Moreover, it has also been associated with politics in America [454]. Bling Bling is at odds with traditional Chinese aesthetics. Traditional Chinese aesthetics emphasises "Jing," describing the sublime totality of the aesthetic world in art, an objectively perceived and subjectively conceptualised aesthetic world [455]. This indescribable intention is expressed in representations that provide subtle and ambiguous feelings. For example, jade- jewellery favoured by ancient Chinese royalty for hundreds of years, unlike shining diamonds, reflects a soft, subtle, and mysterious gloss. The "Bling Bling" aesthetic is more corresponds to contemporary fashion, materialism, consumption, and showing off culture [457], [456]. It also describes stylising objects (e.g., shoes, bags, nails, cars, household items) with artificial crystals to create a diamond-like shimmering effect similar to gilding. Bling Bling as a brightening process has also been adopted in Chinese contemporary art to emphasise exaggerated gilded materialism (e.g., Han Yajuan's BlingBling series 2005-2010) [458].

Kiwi Girl

Kiwi girl is a Chinese internet language used to describe a woman with heavy body hair. The attitudes towards body hair and females are associated with various cultures' gender stereotypy ideology. In the West, the dominant sociocultural meanings construct desirable female bodies as

[93] Donna Haraway's "SF" refers to "Speculative Fabulation, String Figures, and Science Fiction" [450, p.31]. "SF" contains both narrating stories and conveying facts; it involves crafting potential realities and timelines, encompassing material-semiotic worlds, the past, present, and future [450].

slim and hair-free [459]. While body hair is deeply coded as masculinity [460], Hair removal is integrated into the routine efforts deemed necessary for achieving a recognised form of femininity [461] and a social norm [462], which is essentially surveillance of women's bodies [460]. In traditional Chinese Confucian culture, there is a term that says "the body and hair are parents' property, must not dare to destroy them" [463], which means body hair is associated with filial piety and should not be easily damaged. However, female hair removal has gradually become more popular nowadays. It becomes an essential requirement for beauty and cleanliness because media and commercials promote smooth and delicate skin as beautiful and hygienic [464].

In 3D technology, "hair" holds a special significance, typically referring to the simulation and rendering of fine details on an object's surface, such as hair, fuzz, or intricate textures. These details enhance the object's realism and tactile impression, making it appear more lifelike. In fields like game development, film production, and computer graphics, especially with animal characters or richly detailed scenes, the simulation and presentation of hair represent a significant technical challenge. This is because it can substantially affect the final visual outcome, and its execution requires extensive computational resources [465], [466]. Major game engines, like Unity 3D and Unreal Engine, vie to showcase this as a trump card demonstrating their technological prowess [467]. It seems the more realistic the hair, the more carbon-based life-like the agents appear in virtual environments.

2.4.3.3 The Influence of Perspective Settings in Video Games or IVEs on Participants

The use of perspective switching in gaming or IVEs can significantly transform power dynamics between gamers and the gaming system, influencing player experiences and perceptions. When a player enters a space crafted by technology, the initial coding greatly shapes their spatial understanding [359]. Moreover, the player's visual experience is configured through the perspective created by image-making technologies [468]. The manipulation of perspective not only affects the sense of presence in IVEs [321] but also influences emotions [469]. Therefore, perspective defines both game space and how the player is embedded in the game. This, in turn, can profoundly impact the player's overall experiences and perceptions within the gaming environment.

First-person perspective (1PP) and third-person perspectives (3PP) are commonly used in video games. 3PP, offering a global view [359], allows for observational control over avatars and events [470] but may require more time to scan environments and locate objects [470]. Conversely 1PP characterised as a partial view [359], necessitates players to infer visually unavailable information, enhancing immersion [220] and cognitive involvement [471]. Studies utilising electroencephalography (EEG) or magnetic resonance imaging have shown that 1PP and 3PP elicit distinct brain activation patterns [321] and engage different neural processes [472]. Some research indicates that 1PP fosters a stronger sense of embodiment in IVEs [220] and offers advantages in interactive tasks [473]. Contrarily, other studies suggest that both perspectives can induce a high sense of embodiment, particularly in motor tasks [474]. Additionally, research highlights 3PP's role in aiding spatial perception [473], [475], [476] and suggests it may cause fewer simulator sickness incidents than 1PP [476].

There are several unique perspectives in video games, for example, the second-person perspective in Second Person Shooter Zato [477], [478], the Eagle Vision that beyond the human perspective in Assassin's Creed [479], the cinematic lens in God of War [480], perspectives utilising visual illusions in Superliminal [481], the blurring the line between player and investigator, and truth and perception in Her Story [347], animal viewpoints in Maneater [482], time-controlled perspectives in Superhot [483], and perspectives that allow the player to switch between different avatars in Evolva [484]. These diverse perspectives can significantly influence a player's perception.

2.4.3.4 Synthetic Voice for Virtual Humans

Synthetic voice is a crucial component in the realm of virtual humans. Used in various settings such as education, gaming, and consulting, computer-synthesised voices can depict different genders [411], ages [410], and personalities [412]. Studies indicate that incorporating voice into virtual humans enhances trust [485], [486] and suggests a sense of social presence [487]. Much current research, particularly in learning scenarios, focuses on the aspect of trust [485], [488], [489], [416]. Key findings include: User trust can be influenced by the virtual human's voice [485];

higher quality voices are deemed more trustworthy [489]; pairing faces with voices increases trust [418]; pitch is inversely related to trust levels [419]; regardless of age, virtual humans with female voices are perceived as more attractive than those with male voices [490]; and, irrespective of gender, agents with older-sounding voices are more persuasive than those with younger voices [490]. Additionally, virtual humans with male voices tend to have a more substantial impact on decision-making compared to female voices [411]. These insights offer valuable guidance for prototype design.

Chapter 3: Theoretical Framework

Chapter Introduction

GameArt practices within this hybrid space are developing unique characteristics as video games and art converge. Nonetheless, a review of the literature reveals a disconnect between the widespread practical use of GameArt and the relative lack of comprehensive academic frameworks and specific terminology dedicated to the practice itself. Moreover, in the socio-cultural context of China, GameArt practice that informed by techno-feminist principles has barely been explored by artists. Therefore, the theoretical framework chapter begins by analysing and relocating GameArt practices through a new materialist lens in section 3.1. Then, section 3.2 analyses why the art field may provide a better environment for artist-led GameArt practices that draw on technofeminist principles to be effectively conducted. Sections 3.3 to 3.4 analyse aspects related to the prototype's establishment, including why the VR GameArt prototype focuses on female narratives, addressing why the virtual environment provided by the prototype could be regarded as a "mirror apparatus". Section 3.5 addresses the vital design element in the prototype—filtered selfies—and sociocultural characteristics reflected in filtered selfies in China. Finally, section 3.6 explains how this study integrates theories such as new materialism and technofeminism into research practice.

3.1 New understanding of GameArt Practice

3.1.1 The Terms of GameArt practice, GameArt, GameArt Apparatus, and the Creator

The literature review in section 2.2.3 underscores the importance of introducing new terminology to bridge the gap between the widespread practical use of GameArt and the relative lack of comprehensive academic frameworks and specific terms dedicated to the practice itself. Moreover, existing concepts may be inappropriate or lead to misunderstandings when applied to current GameArt practices. On the one hand, technological advancements have ushered in new forms of practice, rendering previous concepts partially obsolete. For instance, the artist group Keiken frequently incorporates cutting-edge technologies such as VR games and blockchain or explores new phenomena like metaverse communities [492]. When Sharp introduced the concept of game art in 2015, immersive technologies were not as prevalent as they are today, and the idea of the metaverse was largely confined to Neal Stephenson's novel "Snow Crash," let alone metaverse communities. Therefore, directly applying past concepts to contemporary GameArt practices may lead to inaccuracies.

On the other hand, previous concepts often described the relationship between video games and art from a dualistic perspective. For example, Alex Stockburger, who examines three significant relationship models between contemporary art and video games, still grounds his perspective on video games and art as perpetually oscillating between appropriation and approximation [178]. Current GameArt practices display a new hybrid relationship between these two fields, which necessitates a relocation from a non-dualistic perspective. Therefore, this study proposes the following terms:

GameArt practice:

GameArt practice emerges in the hybrid field of video games and art. It refers to the creative practice that integrates video game technologies and fine art expressions to engage in virtual

world-building. As a form of "worlding" activity, GameArt practice embodies performative characteristics throughout its process, wherein creators and participants, along with various materials, collaboratively engage in world-building and knowledge making.

GameArt:

GameArt refers to an artefact developed and supported primarily by video game technologies. It often manifests as an interactive virtual digital world, integrating knowledge and elements from video games, art, and other disciplines. GameArt is a crucial component of GameArt practice, serving as a medium for interactions among creators, participants, and materials. In this study, the term GameArt is also used to categorise these artefacts.

GameArt Apparatus:

GameArt Apparatus refers to the dynamic environment where GameArt practices are conducted and developed, encompassing a broad spectrum of physical and conceptual factors. This environment includes but is not limited to, the technical means and materials used in creating GameArt, the contexts for conducting GameArt practices and displaying GameArt, the creators' knowledge and identities, and the cultural and societal narratives that influence conducting GameArt practices.

Creator:

The term "creator" refers to individuals engaged in GameArt practice. Creators in this field typically possess diverse identities and interdisciplinary knowledge. Many are artists from the art field or game developers from the gaming industry. However, they may also be practitioners in both areas or possess knowledge and backgrounds in other fields, such as architecture, film, music, and more.

3.1.2 From “Intervention” to “Hybrid”

3.1.2.1 Artists’ Strategies Using Video Game Technology and Language

In GameArt practice, a hybrid relationship is evident between video games and art, extending beyond mere "intervention." Stockburger, in 2007, identified three modes of relationship between video games and art when artists integrate video games into their art practices. These modes are: "Appropriation," "Modification," and "Artist Games" [178]. These methods were later expanded upon by Obrist in 2022 [175], [196]. They reflect the technological levels of their respective times and the artists' mastery of video game technology, showcasing their knowledge and application skills.

First, according to Stockburger, “appropriation” refers to artists drawing inspiration from video games or appropriating them when they create artworks [178]. This approach represents artists’ light “intervention” in game technology and language. This method emerged in the 1990s, and it was common when video game development was primarily exclusive to gaming companies, and artists had limited access to the underlying game development technologies. This limitation resulted in artists only using video games as a creative context, subject of exploration, or for “post-production” [194], as seen in the works of VNS Matrix, Suzanne Treister, and Peggy Ahwesh during this period. Therefore, this approach can be regarded as a “superficial intervention.”

The second mode, “modification,” involves using video games as platforms or modifying video games for creative purposes [178]. This approach became prevalent post-2000, signifying a more profound “intervention.” This shift from a lighter “intervention” to a more profound one occurred as game companies began separating the development of game engines from game content in the 1990s. This separation gave artists more access to game technologies, leading to creations like those by Julian Oliver and Cory Arcangel, who modify video game technology, game assets, or servers [194]. Obrist’s reference to artists entering video games and conducting projects can be seen as an extension of the “modification” strategy, closely tied to the rise of Massively Multiplayer Online Games (MMOGs) and online gaming communities. This enabled artists to engage with game platforms and communities for creative projects, such as the 2004 “OUT: Operation Urban Terrain,” an intervention in online military simulation game servers [356], and Cao Fei’s RMB City (2008) in Second Life [202]. Overall, the “modification” method demonstrates that artists have gained a deeper understanding of video game technology, with opportunities and capabilities to

modify and utilize it to some extent. However, these modifications are still based on applications created with existing video games rather than directly employing video game technology and language for purely creative purposes. Therefore, “modification” represents a form of in-depth “intervention.”

Although the modes of "appropriation" and "modification" emerged at specific stages of technological development, they continue to be adopted by many artists today, evolving into new forms. For instance, Gareth Damian Martin began creating in-game photography in 2017 [362], and Lei Tong produced a series of landscape paintings within Player Unknown’s Battlegrounds (PUBG) in 2019 [505]. However, in these emerging forms, the artists' creations still largely depend on existing video games. Moreover, in “appropriation” and “modification” modes, artists’ working methods and their roles in the creative process are relatively traditional, usually with a dominant and authoritative role in their works. Even for artists like Julian Oliver and Cory Arcangel, who utilise bugs in game engines to create their works, technology still serves as a tool, and the distinction between the artist’s subjective role and the tool’s auxiliary function is evident in their creative process. Not to mention artists who treat game technology or the contexts it creates as objects for critique or utilisation. Therefore, “appropriation” and “modification” represent artists’ “intervention” in video games, varying only in degree.

Stockburger’s third mode, “artist games” [178], was limited to the technological context and development stage. The examples he used to demonstrate “artist games” are primarily focused on the period up to 2003. Although some of the artists' works he cited in this mode incorporated computer game technologies—such as Blast Theory's "Uncle Roy All Around You"[94] [493], which used GPS technology to engage players both online and offline simultaneously [178]—these examples significantly differ from today's GameArt practices due to the limitations of that era's

[94] The “UNCLE ROY ALL AROUND YOU” is an interactive performance that blurs the lines between game and reality, inviting participants from online and offline to explore the city with the guidance of an enigmatic figure named Uncle Roy, challenging perceptions of trust and surveillance in public spaces.

video game technologies and the interigation of video games and art. Therefore, this mode is not discussed further in the current context.

Regarding Obrist's exhibition in 2022, it showcased many works relevant to GameArt practices. However, Obrist primarily describes the thrid mode as "artists creating their video games" [175], which could be somewhat limiting when describing GameArt practices. GameArt practices are not exclusive to artists or confined solely to the art domain. Practitioners often embody multiple roles, such as Anna Anthropy, who identifies primarily as a game developer, author, and educator [162]. Thus, adhering strictly to Obrist's definition might restrict this study's exploration of GameArt practice from a non-dualistic perspective.

In summary, while many artists engage in GameArt, this practice is not confined solely to artists or the art domain. It represents a process of knowledge-making and reformation through ongoing performative world-building and interactions among participants and materials rather than merely completing an artwork. The creator's role is more complicated and fluid compared to traditional art practices. Additionally, reducing GameArt to simply being video games created by artists may hinder understanding of GameArt practices' complexity and diversity. Consequently, this study will not further explore Stockburger's concept of "artist games" or Obrist's notion of artists creating video games.

3.1.2.2 The Hybrid Relationship

GameArt practice embodies a hybrid relationship between video games and art, emerging post-2010, closely associated with reduced technological thresholds of video games and blurring disciplinary boundaries. Specifically, as commercial game engines advanced, creators found more accessible access to game technology, with modular programming such as Unreal Engine, enabling those unfamiliar with coding to create. Second, video game technology became standardised; leading engines like Unity3D and Unreal Engine, compatible with assets from various 3D software such as Maya, 3DMax, and Blender, supported by Software Development Kits (SDKs) across platforms, facilitated creation and presentation for creators. Third, commercialising video game assets burgeoned with suppliers like Turbosquid's 3D models and Mixamo's

animations alleviates the need for creators to build assets from scratch. Fourth, the booming of third-party game publishers/platforms, for example, Steam, itch.io, and Sandbox[95] offer avenues for showcasing creations. Fifth, the growing attention to indie games revealed diverse uses of video game language beyond mainstream commercial games for creative expressions. Sixth, expanding social media and online communities have enriched gaming culture and creative communities, making communication, sharing, and learning more accessible. Seventh, creative computing courses in higher education frequently utilise game technology for student training in creative programming[96]. These factors significantly enhanced creators' understanding and application of game technology and language, leading to the hybrid nature of GameArt practice in approach and language.

This hybridity is intertwined with creators' diverse identities and knowledge backgrounds too. Accelerated technological development has blurred academic boundaries, increasing the number of interdisciplinary researchers and practitioners. Creators in GameArt not only identify as game developers and artists but also hold various other roles, such as Lean NW as a rapper, Qiang Jiadong as an architect, Anna Anthropy as a writer and educator, Lawrence Lek as a filmmaker and musician. Moreover, knowledge, techniques, and languages from various fields are intergrated into current GameArt practice. For example, Ian Chen's practice spans cognitive science and machine learning; Lu Yang's encompasses psychology, medicine, religion, pop culture, and music [171]. Collaborative approaches, such as Keiken's, to draw upon knowledge and technology from different fields are increasingly common. On the one hand, the hybrid realm of video games and art offers an excellent experimental field for creators; on the other hand, creators' diverse knowledge and abilities inject new variety into the "hybrid gene" of GameArt practice. Consequently, GameArt practice differs from past practices, reflecting a new, hybrid relationship between video games and art.

[95]Sandbox is a blockchain-based metaverse platform that encourages creators to build their own game spaces, encouraging social interaction and community building within the Sandbox platform.
[96]In 2006, Professor Mick Grierson, a pioneer in the field of creative computing, launched the first Bachelor of Science program in Creative Computing at the Department of Computing at Goldsmiths, University of London.

3.1.3 How to Understand Game Art Practices?

Understanding GameArt practices requires various aspects: First, new materialist principles intertwine with GameArt practice. On the one hand, numerous GameArt practices embody new materialist principles during world-building and knowledge-making. Some exhibit Donna Haraway's "SF" [450, p.31] to perceive and create the digital virtual world. For example, Lawrence Lek's "2065" envision a speculative future in which work is unnecessary, allowing individuals to engage in gaming continuously [496]. Some works respond to Karen Barad's thoughts about the "intra-actions" [136], relationship, and symbiosis theories, such as Ian Cheng's Emissaries, a speculative infinite virtual ecosystem simulated through a game engine to investigate non-human controlled agents' adaptability to change [494]. Others echo Kathleen Stewart's emphasis on emotion and perception as core components of worlding activities, for example, Danielle Brathwaite-Shirley's Black Trans Archive, where she has created a distinctive virtual archive world focused on Black transgender experiences, incorporating elements like poetry, fiction, film, interactive gaming, and the concept of transgender journeys. In this space, she collaborates with participants to explore and reconstruct the cultural politics of Black transgender trauma [497], [495], profoundly emphasising audience subjectivity and emotion.

On the other hand, viewed through a new materialist lens, GameArt practice can be considered a creative "practice of inquiry" [149], materialising philosophical ideas through ongoing performative worlding activities. According to Estelle Barrett, art practice is a "philosophy in action" [498], offering solutions for specific and conceptual problems [499]. Rachel Falconer points out that interdisciplinary experiments, including those spanning VR, XR, and gaming experiences, extend philosophy into tangible multi-world production processes [141]. Currently, the meaningful digital virtual worlds that emerged in GameArt practices transform intangible philosophical concepts and speculative ideas into a series of practices and creations. For example, Anna Anthropy's "Dys4ia" records and shares her life and mental state during six months of hormone treatment [163], [206], translating abstract experience into an interactive form that can be experienced. Participants enter

Anthropy's transgender world, co-shaping understanding and construction of gender politics and identity issues [161] through "intra-actions". Jacolby Satterwhite creates a "metanarrative" linking past, present, and future through immersive technology, where participants collectively generate the narrative via memories, rituals, and desires [166]. Lena NW's "Nightmare Temptation Academy" places participants in the role of a 14-year-old girl, experiencing controversial topics such as suicide, sexual abuse, eroticism, and feminism through game narratives and interactions [169], [204], co-forming perceptions of millennial adolescent emotional apathy and confusion under internet addiction and media overexposure [170]. These practices vividly show how abstract philosophical thoughts or speculative concepts are concretised and materialised. Overall, new materialism provides a theoretical framework for GameArt practice, while GameArt practice materialises concepts through worlding activities, embodying the new materialist principles.

Second, in GameArt practice, the concept of "worlding" plays a pivotal role. Through the lens of new materialism, the concept of "onto-epistem-ology" [136, p.185] highlights how entities and knowledge are co-constructed and perpetually entwined through endless performativity [133]. This perspective suggests that during the performative process, matter is inherently uncertain and becomes materialised and solidified through dynamic and constitutive processes and interactions. Within this framework, "worlding" serves both as the goal and as the method through which GameArt practices achieve their objectives.

Take, for instance, Ian Cheng's "Emissaries," a habitat for stories" [507], which is an exemplary embodiment of this theory in action. In Cheng's work, a simulated ecosystem operates autonomously, driven by complex artificial intelligence (AI) algorithms that allow characters and environments to evolve without human intervention. This setup not only represents a virtual world but also actively engages in "worlding" by continually generating new realities and narratives. Here, the virtual world of "Emissaries" transcends mere digital representation to become a dynamic site of knowledge production and reality construction, mirroring the new materialist idea that reality and knowledge are not pre-given but continually made and remade through active engagement. In this context, "worlding" in "Emissaries" is not just the backdrop for the narrative but a critical mechanism through which the virtual environment influences and is influenced by its own existence and the interactions within it. The environment Cheng creates is one where the practice itself—

through the actions and interactions within the virtual ecosystem—shapes and is shaped by the worlds it creates, and the agency is distributed among both human and non-human actors. Therefore, “worlding” in GameArt practice, as illustrated by Cheng’s work, is a dual process: it is the creation of worlds that fosters new understandings and realities and the means by which these creations are realised.

Third, the digital virtual worlds established in GameArt practice are speculative. These worlds relate to, but may not be twins of, the natural world and might not even exist within reality. Their “absence” in the real world refers not only to the absence of natural entities through digital virtual technology but also to a non-promise to essence, implying a “non-essentialist ontology” [149]. For example, Danielle Brathwaite-Shirley’s black transgender archives, Lu Yang’s bizarre Electromagnetic Brainology, Han Yajuan’s hyper-feminine Cyber JiangHu (CJH), and Qiang Jiadong’s Maximalism HyperBody all represent speculative systems of relations associated with the real world but more focused on challenging specific philosophical background assumptions that underpin particular points of focus [136]. These worlds are constructed and produced through a human and non-human agency, continuously reshaping themselves through ongoing, open-ended expression and “intra-actions” [136]. The specificity and diversity of countless human and non-human performances are constantly constituted or reconstructed.

Fourth, GameArt practice is an ongoing creative “practice of inquiry” [149]. The practice transcends the mere completion of an art piece, emphasising “differential becoming” [136, p.185] within the practice mechanism and focusing on the process involving continuous “intra-actions” [136] between human, non-human, and various materials. In the GameArt practice, elements initially conceptualised as speculative ideas not only materialise through artistic practice but also function as subjects of study, continually evolving into new concepts and materials. These elements could be ideas, themes, or interactive components within a game. On the one hand, the interactivity of GameArt practice ensure that the process is active and continuous, constantly interacting with and being updated by participants and materials. An example is Qiang Jiadong’s HyperBody Portal: Stratholme.GoStop is a piece that creates a nonlinear narrative open world through text, illustration, 3D scanning, visual culture references, and modified 3D components. Participants

explore and act according to their preferences, continuously upgrading and questioning their understanding of game fandom [500]. Moreover, the work's physical extensions in different spaces, the entanglement produced visually and audibly, and the transformation through multiple hyperbodies between physical and virtual spaces reinterpret the Portal/channel concept. On the other hand, the nature of game technology updates and iterations also implicitly encourages GameArt practice to be a continuous process. Beneath the user interface of the world lie computer codes and computing power. Upgrades and iterations of game technology, modifications or tampering of files, each repair or new feature, and adding scenes or props can diffract new narratives and systemic construction/reconstruction.

Fifth, GameArt practice occurs within and is materialised through the GameArt Apparatus. As Barad articulates, inquiry practices are performative practices of material inference, where research objects are constituted based on embedded, specific concepts and materialised through practice [149], [150], which means that these concepts, along with their materialisation within the "experimental apparatus," provide the mechanisms for practices that constitute the world [149]. On the one hand, this "experimental apparatus" incorporates a broad spectrum of materials. It includes the human body, non-living entities, tangible substances, spaces, locations, and the natural and constructed environments found in these areas, alongside material forces like gravity and time. It also covers abstract ideas, constructs of human origin, and phenomena related to humans, such as imagination, memory, and cognition [149]. They all could be the components involved in the materialisation process regarding knowledge making.

Therefore, in GameArt practice, its apparatus-GameArt Apparatus is a dynamic systemic ecology. It consists of various elements that collectively contribute to the formation and understanding of GameArt practices. For example, the language and technology used in practice, the presentation and exhibition methods of GameArt pieces, target audiences, modes of interaction and participation, feedback outcomes, the identity, position, and cognitive abilities of the creators, creators' roles in practice, their research on the themes, the interpretive context of the practice, the discourse system of evaluation, as well as reflection and ethics, and ethical politics concerning

non-living entities and forming new material and material concepts during the practice process, are all parties of GameArt Apparatus components.

Angela Washko's 2018 project, "The Game: The Game," exemplifies the complexity and dynamism of this apparatus. This work, rooted in extensive research, interviews, and documentation of the pick-up artist (PUA) community, synthesises speculative narratives about extreme male-female interactions into a playable, simulated dating scenario utilising game engine technology. It demonstrates how the GameArt Apparatus not only involves technological and artistic tools but also encompasses research methodologies, thematic exploration, and audience engagement. In Washko's work, the GameArt Apparatus includes the tangible materials, such as the software and hardware used to create and run the work, and the conceptual elements, like the ideas and narratives that shape the gameplay experience. It also involves the spaces where the game is displayed and the interactions that occur there, both digitally and physically. These elements are dynamically integrated, enabling participants, particularly women, to navigate and interact with the scenarios presented, thereby actively contributing to the ongoing discourse on gender dynamics within gaming. This interaction does not merely pass through the work but collaborates in constructing a guide for navigating complex social interactions, showcasing how the GameArt Apparatus facilitates a performative and participatory process of knowledge creation and transformation.

Sixth, the role of creators in GameArt practice is similar to a "superposition state" and bears moral responsibilities. This state breaks the subject-object dichotomy and is immersed in the situation similar to the "withness" that Tara Page reveals when she reveals the researcher's role in practice research[142, p150], implying an entangled emergence that is messy, unstructured, or unordered, non-hierarchical, non-dualistic, and open to potential and possibilities [142]. Here, creators continuously negotiate and renegotiate their identities through ongoing "intra-actions" [136] [142], a marked departure from the authority role traditionally held by artists.

For example, in "Wisdoms for Love 3.0," Keiken investigates the emotions prevalent in society and the challenges of a decentralised future, introducing "wisdom" as a novel concept of wealth within

blockchain gaming. Participants are engaged in decision-making, interaction, and the collection of NFT-based “wisdom tokens,” where the essence of these transactions is defined by moral rather than financial value [167]. This setup illustrates Keiken’s fluid identity; they establish a world but give agency to the world, itself self and the participants, allowing participants and the materials to co-create the narrative. As participants traverse metaphorical choices and partake in real-time conversations, they contribute to a continuously developing story, blurring the distinction between the creator and the participant and creating a collaborative narrative environment. Furthermore, Keiken’s approach to framing the exchange of “wisdom tokens” as moral transactions rather than financial ones underscores the creators’ significant responsibility in the practice. This strategy prompts participants to contemplate their engagement with the work critically, addressing broader issues regarding the commodification of digital assets and the ethical considerations of blockchain technology.

Brathwaite-Shirley’s way to involve her work the Black Trans Archives [497] also exemplifies her dynamic identity that surpasses conventional limits. Her integration of poetry, fiction, film, and gaming into interactive experiences creates a participatory space where the evolving identities of the participants and the narratives intersect and blend. This interactive framework allows participants to actively shape the narrative, effectively co-authoring the experience through their choices and interactions. Brathwaite-Shirley negotiates and renegotiates her identity as the creator throughout the process. Moreover, her methodology is notably marked by a commitment to addressing sensitive topics with a profound sense of responsibility. The prerequisite for participants to complete a survey on gender and identity prior to engagement is a deliberate measure to foster responsible interaction, aiming to counter the commodification of trauma and ensure interactions are respectful and meaningful [495]. This selective process underscores her dedication to ethical engagement, stressing the need for consent and mindfulness when engaging with content concerning marginalised groups. Additionally, her work serves as a communal space for personal storytelling and collective contemplation, underlining the duty of GameArt practitioners to offer platforms for often overlooked voices and encourage participants to engage with and comprehend complex identities and histories.

In their practices, Keiken and Brathwaite-Shirley embodied the new materialist principles by giving agency and accountability to the practice themselves [149], as well as taking a philosophical and moral responsibility [39], [133]. Their roles—encompassing developers, observers, researchers, artists, participants, and learners—exhibit fluidity, variability, and overlap throughout their creative process. This approach reflects their active engagement in selecting elements to include or exclude [136], underscoring their philosophical and moral commitment within the broader context of the material world and its continual, open-ended manifestation [39], [133]. Such commitment necessitates a careful and respectful interaction with the Other, characterised by deliberately avoiding assumptions or impositions and marked by attention, recognition, understanding, care, and responsiveness [142] p153. As Barad articulates, the world's becoming is a profound question of "posthumanist ethics of mattering" [149], situating moral agency and responsibility not in human subjects but in the practices of knowledge creation (and others), with their power and influence in creating worlds and boundaries [136, p.136, 185].

Seventh, in GameArt practice, currently GameArt are often presented within video game or art contexts. On the one hand, in the art domain, museums and art institutions actively promote ongoing dialogues between video games and art. The themes explored align with academic trends, shifting from questioning whether video games are art to more nuanced levels of discussion. On the other hand, discussions are also fermenting within gaming studies and communities. As these explorations progress, related GameArt works are increasingly displayed to the public through exhibitions, seminars, and other means. However, when GameArt works are isolated within the frameworks of either games or art, the interpretation and evaluation of these works inevitably become influenced by the discourse and the public's expectations of that context. Moreover, the longstanding complex relationship between video games and art and a lack of more profound understanding of current GameArt practice often leads to misinterpretation of GameArt. A common issue is defining a GameArt as an artistic video game or a gamified artwork from a binary perspective, which not only overlooks the complex and ongoing process of making/remaking in GameArt practice but also ignores the dynamic apparatus in which the practice occurs, thereby posing barriers to understanding the new materialist attributes of these worlding activities.

In conclusion, GameArt practice emerges in the hybrid field of video games and art. It refers to the creative practice that integrates video game technologies and fine art expressions to engage in virtual world-building. As a form of “worlding” activity, GameArt practice embodies performative characteristics throughout its process, wherein creators and participants, along with various materials, collaboratively engage in world-building and knowledge making. GameArt practice occurs within and materialises through the dynamic systemic environment of the GameArt Apparatus. GameArt is a vital component that acts as an interface to reach broad intra-actions, which links participants and the creator’s practice, where object and subject roles are fluid, human and non-human entities and all materials intra-act, leading to the ongoing emergence of knowledge-making and remaking.

Inspired by Haraway’s cyborg’s “unfaithful” offspring metaphor [450], similarly, GameArt practice may not need to forcibly establish an exclusive subordinate “identity” entangled with its authoritative “parents” — video games or art. Its emergence reflects not only the non-dualistic relationship between video games and art but also produces unique language, enriches the “practice of inquiry” [139], and even fosters new politics and ethics aesthetically, culturally, and politically. The recent surge in AI technology has also opened up new potentialities in GameArt practice. Therefore, a comprehensive understanding of current GameArt practice and providing a sustainable GameArt Apparatus are crucial for GameArt practice development.

3.2 Exploring Artist-led Techno-feminist GameArt Practice in China

3.2.1 Why it is Necessary?

The urgency and importance of exploring artist-led GameArt practices that draw on techno-feminist principles in China stem from a few reasons: First, While GameArt has been employed by many artists to challenge gender biases and enhance female visibility, in China, this practice is not widely used for such purposes. This underutilisation suggests a significant untapped potential to influence

societal norms and challenge entrenched gender stereotypes through creative mediums. Second, the limited integration of GameArt to address gender stereotypes in China is partly due to societal resistance towards feminism. Negative perceptions and repercussions associated with feminism can inhibit artists from adopting or promoting techno-feminist ideals within their work. This resistance makes it crucial to explore and demonstrate how GameArt practice can be a positive force for facilitating reflective dialogues of socially constructed gender roles among Chinese women and promoting active engagement of Chinese women in the creative technological sector. Third, the relative lag in developing hybrid practices that integrates video games and art in China indicates a gap in the innovative use of technology for artistic expression. This lag represents a missed opportunity for fostering a more dynamic cultural and artistic landscape that can address and reflect contemporary social issues, including gender bias. Fourth, although techno-feminism is a potent framework for examining the interplay between technology and gender [5], [7]-[9], its principles are not sufficiently integrated into the Chinese GameArt scene. This lack of adoption underscores the need for initiatives to bridge these conceptual and practical gaps, making exploring techno-feminist GameArt practices urgent and essential.

3.2.2 The Role of Art Context

While GameArt practices are adopted by European and American artists to challenge gender bias in gaming and art fields, the literature review and interviews with gaming industry professionals indicate that such practices, particularly those drawing on techno-feminist principles, are virtually non-existent in China's gaming industry. Moreover, due to the unique characteristics of video games and the current state of the gaming industry in China, the gaming field may not be conducive to developing GameArt practices informed on techno-feminist principles shortly. Consequently, the art context is pivotal in conducting the techno-feminit artist-led GameArt practices in China.

First, compared to the gaming industry, the art field in China offers a relatively open and inclusive atmosphere for artists to engage with topics that the mainstream gaming industry often avoids due

to commercial pressures or censorship concerns. Compared to video games, art creations are generally seen as individual expressions, especially contemporary art, which is not so closely related to a national technological and cultural renaissance, therefore facing less strict regulation. This openness encourages the exploration of themes that challenge societal norms and provoke thought, as well as experimental approaches. Second, the art field's established infrastructure for funding, public engagement, and institutional support may present a conducive environment for GameArt practices. Unlike video games, which may face barriers to public visibility without official approval or licenses or the monopoly of the gaming industry's giants over channels and distribution, art projects can tap into existing networks of art funds, galleries, and institutions dedicated to promoting cultural works. This ecosystem provides financial and logistical support and platforms for dialogue and engagement with diverse audiences. Third, the cultural prestige associated with art in China enhances the public's perception of GameArt practices, allowing them to be recognised as significant cultural contributions rather than entertainment. This respect elevates the status of GameArt practice, facilitating its acceptance and appreciation by a broader audience. Fourth, the art world usually attracts creative, critically minded audiences. It also fosters an environment that facilitates research, public education, and the dissemination of innovative ideas, which can not only reach the right audience for GameArt practice but also promote and support techno-feminist GameArt practice, integrate it into academic and cultural discussions, and ensure its creation of meaningful impacts rather than entertainment. Therefore, the art context in China provides a rich and supportive environment for conducting and developing the artist-led techno-feminit GameArt practice.

3.3 Prototype Highlighting Female Narratives

The decision to centre this study's VR GameArt prototype on female narratives is a strategic and deliberate move. This focus is not merely about including female characters or perspectives but also encompasses a comprehensive exploration of female experiences through seven aspects in the prototype design: Background stories, ultimate goals, scenes and tasks, fragmented and

situated narratives, “mimesis” [449], the illusion of agency, and numerous female NPC characters. This approach is significant for several reasons.

First, despite some exemplary female and feminist narratives within video games and gamified artworks, this area remains largely underexplored. The prototype’s focus on female narrative seeks to expand the existing body of work, offering new insights and understandings about female experiences and expression approaches. Second, in the male-dominated spheres of gaming and art in China, a GameArt work that foregrounds female narratives and challenges gender stereotypes inherently carries a techno-feminist stance. This stance challenges the status quo and promote alternative narratives that diversify the representation within these fields. Third, narrative creation within gaming is a co-creative process that involves both the creators and the participants [338]. By structuring the prototype around crucial questions related to gender stereotypes in China, the prototype may facilitate a dynamic interaction where participants engage with, deconstruct, and reconstruct narratives, thereby fostering a sense of ownership and involvement. Fourth, emphasising female narratives in the prototype goes beyond merely featuring females as main characters. It involves designing elements that resonate with women and ensuring female creators’ participatory and proactive involvement in the development process—this includes female perspectives and preferences in applying technology.

3.4 The “Mirror Apparatus” as a Design Strategy in the VR GameArt Prototype

3.4.1 Why Use the VR GameArt Prototype?

Utilising the “mirror apparatus” as a design strategy in the VR GameArt prototype draws inspiration from the Apparatus theory in film studies, which conceptualises the 2D screen as a mirror, engaging the audience through film language to project themselves, thus influencing their perception [301]-[304]. In the prototype design, the “mirror apparatus” strategy transforms the VR GameArt prototype’s interactive IVEs into an immersive space that “reflects”. It aims to influence

participants' self-perception, leveraging VR GameArt's media potential to include designs based on the mirror stage principles, as well as exploring other influential elements such as Lacan's concepts of the Other and the Big Other. This strategy encompasses traditional virtual mirrors and innovative approaches like out-of-body experiences, selfies, and synchronising NPC motions with participants.

The feasibility of the "mirror apparatus" strategy emerges from various considerations: First, VR's impact on participants' self-perception is grounded in studies demonstrating IVEs' influence on users' cognitive processes through body ownership and presence (see 2.3.1), highlighting the potential for reflection and transformation of self-perception within virtual spaces. The effectiveness of using virtual mirrors in IVEs to examine issues like body ownership, supported by dedicated studies on VR mirrors [300], underpins this strategy. Second, game research on in-game mirrors illustrates the complex relationship between reflections and participants' self-perceptions [298], [299], [295]. Studies on game elements like avatars, agents, gameplay, and camera perspectives reveal their significant impact on players' self-perception (see 2.4), suggesting potential for incorporating these elements with the "mirror apparatus" concept. Third, the mirror stage theory offers profound insights into self, identity, and social interactions, with existing research on the mirror stage in VR revealing the effectiveness and complexity of such applications in VR [296], [297]. Fourth, the Apparatus theory emphasises the role of media in shaping perceptions and subjectivities [301]-[304], [291], suggesting the interactive IVEs of the VR GameArt prototype may offer advantages over traditional 2D screens (see 3.4.2). Fifth, new technologies providing non-traditional reflective media and its non-mirrored reflections also impact cognition [293], enlightening the "mirror apparatus" strategy's innovative potential and suggesting novel design ideas for the prototype. Sixth, in current VR studies, the experimental prototype often employs a simplistic design - a virtual mirror [300]. However, existing research suggests that out-of-body experiences [248], [249] resemble an externalised form of Lacan's mirror stage [322], leading to the creation of a projected identity [323]. Selfies, especially with filters, are a widespread practice among women today, closely related to gender and feminism studies [325], [327], [328]. These insights support the potential of applying the mirror stage in innovative approaches in the prototype design.

Overall, studies validate VR's effectiveness in altering cognition and perceptions and underscore the "mirror apparatus's" crucial role in self-perception. The mirror stage theory, with its insights into self and identity, applied within VR and video games, demonstrates the intricate interactions between avatars and participants. These insights advocate for the strategic use of mirrors in prototype design, presenting a rich opportunity for innovation. Therefore, this study seeks to integrate various fields' outcomes, contemporary phenomena and technologies with the concept of " mirror apparatus," innovatively applying mirrors and related theories to extend IVE applications and introduce new creative methodologies, which may offer new perspectives to the application of mirror stage theory in interdisciplinary areas, especially for designing elements that influence participants' perception.

3.4.2 Advantages of Consider Prototype's IVEs as a "Mirror Apparatus"

Consider IVEs in the prototype as a "mirror apparatus" is inspired by the Apparatus theory in film studies that employs Lacan's mirror stage, where numerous theorists analyse the film screen as a "mirror" influencing audiences [301]. The "mirror apparatus" design strategy may offer profound advantages for influencing participants' perceptions, surpassing traditional film screens in immersive and interactive capacities. First, unlike the passive, two-dimensional engagement with a film screen, VR's immersive 3D environment envelops participants in a continuous, interactive, multisensory world[226], [273]. This environment translates visual, tactile, and proprioceptive inputs into a self-focused neurological framework [241], fostering more powerful illusions of presence and ownership [228]. Second, a key aspect distinguishing VR GameArt protoytype from the film is the prevalent use of the 1PP, which deepens immersion and cognitive engagement in contrast to the film's 3PP. This perspective shift results in unique brain activity patterns [321], fostering a stronger sense of embodiment and interaction effectiveness [220], [473]. Third, the spatial freedom and interactions offered by the VR GameArt prototype support increased autonomy and exploration, surpassing the film's passive viewing, fostering deeper engagement with the virtual environment, and reinforcing the participant's connection with their virtual avatar, promoting a more meaningful interaction with the virtual environment. Fourth, VR GameArt,

beyond film's reliance on sound, visuals, and editing [304], leverages diverse design aspects like game mechanics and spatial construction. These additional elements offer varied methods to impact participant perceptions and experiences. Fifth, framing the prototype as a "mirror apparatus" extends beyond establishing specific mirror stages to creatively weaving elements capable of metaphorical mirror reflections into the immersive experience. For example, by embedding the crowd NPCs as representations of the "Other," their actions and visuals influence participants, mirroring Lacan's idea of the "Other"'s effect on self-identity formation. Also, employing NR1 to articulate the Code of Conduct functions as a "Big Other," with their influence on participants akin to a "mirror reflection," reinforcing Lacan's theory of the "Big Other's" significance in self-identity development.

Therefore, employing "mirror apparatus" as the VR GameArt prototype design strategy may transcend traditional films' static, predefined self-projection, introducing a dynamic, open-ended exploration of self. The prototype's immersive environments, 1PP, and interactive elements, combined with the symbolic incorporation of the "Big Other" and elements that allow for metaphorical reflection, may enhance participant engagement and embodiment and foster a deep, multisensory connection with the IVEs, providing a nuanced platform for females to reflect on gender stereotypes in China.

3.4.3 Key "Reflective" Elements in the "Mirror Apparatus"

3.4.3.1 Other and Big Other in the Prototype

Integrating Jacques Lacan's concepts of the Other and the Big Other as central "reflective" elements within the VR GameArt prototype may effectively transform the virtual space into a dynamic "mirror apparatus." These notions are fundamental to understanding individual self-awareness. Despite the mirror stage being primarily an illusion [283]-[285], it lays the groundwork for interactions with the Big Other—a system of norms that moulds an individual's desires, taboos, and norms, thus significantly impacting their self-identity， self-perception and behaviour. This

interaction underscores the ongoing quest of individuals to locate their position within this intricate system [285].

In Lacan's theory, the Other is pivotal for self-identification within a communal context, acting as the locus where language and, consequently, the self are constituted [277]. In the prototype, the concept of Other is embodied by NPCs, including crowd NPCs and The Forsaken NPC, which serve as virtual counterparts of the Other. Through the design of NPCs appearance, dialogue, behaviours, and interactions, these characters may be able to offer participants "mirror reflections" through which to view and evaluate themselves. This engagement not only simulates social interaction but also has the potential to influence participants' perceptions, possibly inducing conformity or rebellion, akin to herd behaviour observed in existing research findings that participants engage socially with NPCs, influencing their perceptions and possibly triggering herd behaviour [313], [314], [417], [224], [226], [501]. The NPCs' actions and feedback within the virtual world thus become mechanisms through which participants navigate their self-identity and place within the social matrix.

The Big Other, representing the broader societal, cultural, and symbolic systems, dictates the norms, desires, and taboos that shape individual behaviour and self-perception [285]. This symbolic structure is crucial for the individual's interaction with social customs and laws, continuously seeking their place within this system [285]. The prototype manifests the Big Other through the in-prototype world's overarching rules, values, missions, and gameplay mechanics with pervasive influence. These elements construct a world that demands adherence to a specific set of expectations; when participants adhere to these rules and missions, they effectively follow the Big Other's demands. Moreover, even the symbolic gaze of the Big Other, represented in the prototype by systemic elements like the narrator's role 1 (NR1) announcing the Code of Conduct, may also exert a pervasive influence on participants [327], shaping their in-prototype behaviour and perceptions because participant interactions in this environment are grounded in a symbolic system, where its norms and rules mirror the societal structures influencing behaviour and self-perceptions in the real world.

By integrating the concepts of the Other and the Big Other as reflective elements within the VR GameArt prototype, this approach not only reflects Lacan's psychoanalytic theories but also provides a unique lens through which to examine the impact of the prototype design on participant self-perceptions.

3.4.3.2 The Avatar in the Prototype.

In the VR GameArt prototype, the participant's avatar (main character Xiao Mei), predominantly engaged through a 1PP, is rendered invisible to the participant except during the fourth specific mirror stage. The medium characteristics of VR initially necessitated this design choice. However, it makes additional sense and advantages for the prototype's theme and narrative and aligns seamlessly with Lacanian theories. It transforms the avatar into a critical "reflective" component within the "mirror apparatus" framework, significantly impacting participant perceptions and serving multifaceted objectives.

First, the invisibility of the avatar as 1PP enhances immersion and engagement by facilitating a direct "I" perspective experience [220]. This "avatar as Me" [373] player-avatar relationship shapes gameplay directly [366]. Therefore, it may strengthen the bond between the participant and the virtual self to explore the prototype's theme and narrative further.

Second, the invisibility of the avatar not only responds to the initial fragmented perception and self-awareness characteristic of infants before Lacan's mirror stage but also supports the in-prototype storytelling that Xiao Mei is an avatar that has been recycled and needs to be repaired before being re-matched to a new Source Life to "reborn" (see more design details of Xiao Mei Appendix C: AC.4.1). This way allows the prototype to integrate design and theory in a celestial way.

Third, this approach might respond to Lacan's concept of the Real, where the unseen avatar may stir participant curiosity or anxiety because the Real is the realm that cannot be fully articulated or understood through the Symbolic or Imagined [285]. It confronts the subject with the limitations of language and the impossibility of fully representing or mastering reality, leading to profound anxiety

[285]. Therefore, leaving the avatar unseen may foster a more profound exploration within the identity-themed environment of the prototype.

Fourth, the prototype aims to encourage participants to reflect on female identity and positioning issues in an open-ended manner, without prescribing specific outcomes, thus maintaining narrative flexibility that allows for personal interpretation and engagement. Many studies reveal that participant's avatars can impact their cognitions and behaviours significantly [239], [386], [387] both in online and offline contexts [239], [383], [388]. Playing as sexualised female avatars can cause various negative influences on women [380], [381], [383], [384], [378], [387], [389], [390]. Therefore, the invisibility of the avatar opens a space for imagination and personal identification, deliberately avoiding the common preconceptions associated with female game characters.

Fifth, although the avatar is consided a crucial reflective element in the prototype design, its "reflection" within the prototype is not a direct visual but is embodied by interactions with the Other and the Big Other. According to Lacan, self-formation begins with the illusion of the mirror stage, followed by interactions with the Other and the Big Other [285]. In the prototype, participants develop and evolve their role identity through this complex interplay, with their self-perceptions being influenced by the virtual environment's specific mirror stages, systemic rules, and narrative tasks. Moreover, this process of self-imagination and identity exploration is further complicated in the "mirror apparatus" by the inherent complexity of VR technology and game language, as well as the perceptual distance between the participant (the perceiving subject) and the avatar (the perceived object) [297].

3.4.3.3 Specific Mirror Stages in the Prototype

In the prototype's "mirror apparatus," four specific mirror stages are designed as crucial reflective elements. They are:

First specific mirror stage: Filtered selfies.

Second specific mirror stage: The Forsaken NPC (it actions synchronised with participants' motions, implying a non-mirror reflection).

Third specific mirror stage: Virtual mirror.

Fourth specific mirror stage: Out-of-body experiences.

(see 4.5.6.3 for design details)

Rationale for the First Specific Mirror Stage Design

Filtered selfies are designed as the first specific mirror stage for various reasons. First, selfies could operate similarly to the mirror stage, as a modern version, to influence people's self-perceptions (see 2.3.2.6 and 3.5). In the mirror stage, infants see not their real selves but an idealised image [285], similar to how filter users adjust their appearance to fit social standards. Second, Lacan considered the mirror stage the beginning of self-identification, based on an imaginary external image [285], then the Other and Big Other will shape the process. Likewise, the self-presented by filtered selfie users on social media is not entirely their true selves but rather a response and adaptation to external evaluations and social standards. Third, the mirror stage provides an illusion that the individual is complete and unified, which contradicts their fragmented and dependent state [285]. Correspondingly, photos beautified with filters give users an illusion of a perfect self, which may significantly differ from their actual state, creating psychological tension and conflict. These aspects indicate that filtered selfies may function as a form of the mirror stage in the digital era. Additionally, as literature reviews 2.3.2.6 reveal, as a popular activity today, filtered selfies are not only related to women's construction of self-image/identity but also have rich social meanings in China (see 3.5). Therefore, incorporating filtered selfies as one of the specific Mirror stages combined with existing findings of body ownership and in-game avatar's impacts on participants in the prototype, which may not only influence participants but also potentially resonate quickly, provoking further reflection by exaggerating this "aesthetic labour."

Rationale for the Second Specific Mirror Stage Design

The second specific mirror stage is the Forsaken NPC, which is inspired by "reflections" generated by new technologies. On the one hand, studies show those non-mirror "reflections" create a new image of the "body" [293] (see 2.3.2.7). On the other hand, in VR, participants can develop body ownership for avatars of various forms [220], [240]-[242], [244]-[247], [250]-[261] (see 2.3.1.3), even in the absence of additional visual stimuli, as long as there is synchrony between action and vision [264]. Therefore, the prototype design will utilise this principle by synchronising the Forsaken

NPC with the participant's vision and actions, forming a "mirror" reflection as part of the mirror stage.

Rationale for the Third Specific Mirror Stage Design

The third specific mirror stage represents the Lacan's mirror stage directly, but in IVEs. It may influence self-perceptions by enabling participants to develop a sense of self towards their avatars in a virtual mirror. This approach may be practical because it is commonly used in IVEs to explore participants' sensation of self in multiple studies. Moreover, numerous studies also demonstrate that body ownership in VR is closely linked to self-recognition [267]-[270]; experiencing body ownership over various virtual bodies can affect people's cognition, attitudes, behaviours, and sense of self [256], [240], [244], [222], [246], [271], [252], [261], [257]. Additionally, these influences can persist even after the virtual stimulus has disappeared [273]. Therefore, this design may be practical.

Rationale for the Fourth Specific Mirror Stage Design

The fourth specific mirror stages is an out-of-body experience. Existing research suggests that out-of-body experiences can also arouse body ownership illusion [248], [249]. It resembles an externalised form of Lacan's mirror stage [322], leading to the creation of a projected identity [323]. Therefore, in the prototype, by switching the camera perspective, participants are removed from a 1PP to a 3PP, enabling them to observe their avatar from an external viewpoint, thereby creating a form of "mirror reflection."

3.5 Sociocultural Implications of Filtered Selfies in China

In the digital age, selfies have become a from of mirror stage. At the same time, beauty filters contribute to the coding of the ideal self (see 2.3.2.6). In the "self-imaging practice" [325], filters offer not just aesthetic evaluation and "help" [328] but also play an unprecedented role in surveilling and scrutinising women [328], [330]. The phenomenon of filtered selfies echoes

Jacques Lacan's notion of the mirror stage, recontextualised in the digital age, where the pursuit of an idealised self-image through filtered selfies mirrors a unified yet illusory self.

In China, filtered selfies have transcended mere self-portraiture to become pivotal in the sociocultural negotiation of identity [514], embodying a complex interplay of societal norms, visibility, and ongoing self-construction. These digital self-images, enhanced by beauty filters, act not just as tools for aesthetic enhancement but as mediums through which the pressures of surveillance, gender norms, and class expectations are reflected and perpetuated. Therefore, employing filtered selfies as a key "reflective" element in the prototype, its "reflections" exemplify three features in China: Overlapping, visibility, and continuity.

Overlapping

Overlapping signifies the integration of diverse societal norms related to gender and class into one's digital self-representation. The state, market, corporations, media, and public opinion collectively mould and advocate for the idealised image of the "neoliberal" consumer [38]. For instance, the "spendthrift chicks," [38] depicted as attractive, young, and cultured high "Su Zhi" [40] urban women, contrasts starkly with the portrayal of "thrifty wives" [38] as unattractive, uneducated rural women [38]-[40]. In this framework, selfies and filters act as mediums and a shortcut through which individuals navigate and align themselves with these idealised images. Thus, filtered selfies emerge as platforms where adherence to and validation of these societal norms are prominently displayed and reinforced.

Visibility

Visibility represents a sense of presence [325] and group belonging, underscoring China's collective dimension of digital self-imaging practices. It highlights a cultural predilection for societal acknowledgement and group belonging over individual authenticity [327], leading to the popularity of "clock-in" selfie-taking. This visibility is crucial for social acceptance and emphasises the collective-oriented aspect of Chinese culture, where belonging, like everyone else, and acknowledgement from society is paramount.

Continuity

Continuity in the self-imaging process through selfies signifies an ongoing process of self-fashioning and identity negotiation, necessitating continuous engagement with digital platforms and technologies. Continuity plays an essential role because successful selfies are a fundamental approach to establishing and maintaining personal "relevance" [325]. It is a continuous process of shaping, editing, and producing self-imagination [328], requiring sustained consumption and investment. In the IVEs, such continuity in identity construction must be achieved through ongoing synchrony with the mirrored self-image to establish a sense of ownership over the avatar [264], [316]. Therefore, in the prototype design, continuous filtered selfie-taking will be used as the main narrative-driving task and as the first type of specific mirror stage.

Incorporating filtered selfies as a key narrative-driving element and as a specific mirror stage in the VR GameArt prototype may leverage these sociocultural dynamics. It can facilitate a critical engagement with the concept of body ownership in virtual environments and may prompt deeper reflection on the sociocultural implications of these practices. By situating filtered selfies within the prototype, the design invites participants to critically reflect on issues in constructing women's identities in the digital age, mirroring real-life scenarios.

3.6 Theories' Relevance to this Study

3.6.1 Linking the Study to Techno-feminist Principles

The interconnection between this study and techno-feminist principles is multifaceted, highlighting both the influence of techno-feminist theory on the study and the study's exploration of the application of techno-feminist principles in artist-led GameArt practice in China. On the one hand, the techno-feminism principles guided this study. It informs the study's conceptual orientation, the prototype design, and how to conduct workshops, observation, and result analysis. This foundation not only guides the study's approach but also aligns with techno-feminist broader objectives, emphasising feminist expression and critique through technological and artistic mediums. On the

other hand, the study becomes a medium through which the way to apply techno-feminist principles in China is explored.

3.6.2 Linking the Study to New Materialism

New materialist theories play a significant role in this study. First, new materialist theories furnish this research with a robust theoretical framework for analysing GameArt practices. This new materialist perspective underscores the performative agency of materials, emphasises practices and "intra-actions" [136], and reveals the role of creators, thereby playing a vital role in analysing and establishing insights for GameArt practice. Second, the execution of the research practice is influenced by new materialist theories that emphasise the material world's agency. This approach acknowledges the capacity of both tangible and intangible materials to actively shape human cognition and behavior [133], [134], [136]. By recognising the significance of materials and combining them with the autoethnographic methodology, this study attempts to capture the complex interactions between participants, the prototype, and the workshop environments. Third, new materialist principles offer a new perspective on the researcher’s roles within the research. Through a new materialist lens, the researcher’s role is dynamic, continuously shaped by the research practice, and blurs the distinctions between different roles within the research process. Such fluidity encourages the researcher’s active participation and inquiry and fosters a collaborative environment where knowledge is co-constructed, leading to organic learning and understanding. This facilitates dynamic observation, exploration, and interpretation. Fourth, new materialist theories emphasise the practice process and "intra-actions" [136]. Through this lens, the study focuses on the procedural and relational aspects of the research, viewing the co-created spaces and reflections as integral to understanding the complex dynamics at play.

3.6.3 Linking the Prototype to Theories

The integration of the prototype within the study exemplifies a multidisciplinary approach, drawing upon theories and knowledge from diverse fields to shape its conceptualisation and development.

This intricate linkage between the prototype and theoretical frameworks is evident in several key dimensions:

First, specific theoretical insights directly inform the prototype's design, which serve as foundational pillars that guide its construction. For instance, the Uncanny Valley effect—a concept originating from robotics and psychology [421], [422]—plays a crucial role in the appearance design of the crowd NPCs, aiming to navigate the fine line between realism and eeriness in virtual characters, therefore function as "Other" to create impact on participants effectively. Similarly, Luce Irigaray's concept of "mimesis"-disrupting the fixed status by exposing the vulnerability of stereotypical identities as politically empowering [449] not only influenced the prototype's choice of an ironic approach in its artistic expression style but also manifested in its main visuals and props. For instance, the prototype features exaggerated techno-pink spaces and employs feathers, symbolising feminine delicacy, as weapons to break through systemic conventions. Moreover, theories related to VR, such as body ownership, and studies related to videos, like avatars and agents, and other research findings, like synthetic voice, also play vital roles in shaping the prototype's different parts, ensuring the prototype's effectiveness.

Second, the prototype is a medium for exploring and extending existing theories. For example, the prototype design draws inspiration from Lacan's mirror stage theory, where the "mirrors" and avatar dynamics offer fresh self-recognition and identity formation perspectives. Lacan's Other and the Big Other concepts are recontextualised, allowing for examining social interaction, subjectivity, and the symbolic order within the prototype's virtual spaces. Similarly, the application of Luce Irigaray's concept of "mimesis" [449], such as the intensive pink world and utilising soft feathers as a weapon. Moreover, drawn from the film study's Apparatus theory, considering the prototype's IVEs as a "mirror apparatus" opens up a novel method to tie the prototype design elements into the mirror, enriching the analysis of virtual GameArt spaces as sites of complex identity negotiation and self-reflection.

Chapter 4: Methodology

Chapter Introduction

The methodology chapter provides a detailed account of the approaches adopted to explore how an artist-led GameArt practice that informed by techno-feminist principles can provoke women engaged in interactive a prototype and workshops to reflect on gender stereotypes in China. Section 4.1 introduces why and how this research employs a mixed-methods approach, outlines the interrelation between the main research question and four sub-questions, and identifies the target group. Sections 4.2 to 4.8 detail the steps taken in the Alpha and Beta phases. These steps encompass literature review, interviews with industry professionals, development of a theoretical framework, prototype design and development, prototype's internal testing and refinement, conducting workshops in the art context, and the analytical methods applied to the research data. Subsequent sections from 4.9 to 4.13 discuss the evaluating methods of the study's findings, ethical stance, encountered challenges and their solutions, expected results and outcomes, the relationship between the artist's identity and the research, and the study's potential constraints.

4.1 Methodology Overview

4.1.1 Why Using Mixed Methods?

This practice-based research employs a mixed-methods approach, establishing a framework that integrates theory and practice. The main research question unfolds through four lines of inquiry, spanning the Alpha and Beta stages. The mixed methods primarily include the following three aspects:

Qualitative Research Methods:

Creation of the Artwork/Prototype: Develope a VR GameArt experience that explores gender stereotypes informed by techno-feminist principles.

Documentation: Record the research process, observations, and changes in various ways, providing a qualitative narrative of the project's evolution.

Interviews: Conduct in-depth discussions to gather detailed insights into individual experiences and interpretations.

Participatory Research Methods:

Workshops: Create a space for communication and learning, facilitating interactive sessions where participants actively engage with GameArt and contribute to the artistic creation and evaluation.

LFP Making: Engage participants in the design and development process, allowing them to influence the outcome and explore new expressions of GameArt.

Group Discussion: Conduct discussions that allow participants to share their views and insights, fostering a collective understanding and collaborative analysis.

Autoethnography:

Use the researcher's experiences as a lens to interpret how broader cultural patterns intersect with personal journey, particularly in creating and responding to GameArt practice.

The choice to use mixed methods in the study stems from three main reasons. First, the research topic intersects domains such as art, video games, VR technology, and gender studies, each with its variables and influences. These domains interact in complex ways that are challenging to capture with a single methodological approach. Mixed methods provide a nuanced understanding by combining the strengths of qualitative, participatory, and autoethnography approaches. Secondly, the study emphasises the process of artistic practice and reflective inquiry, which is central to understanding the dynamics within artist-led GameArt practices. Mixed methods facilitate a deeper understanding of these interactions, capturing the evolving nature of artistic endeavours as they respond to participant feedback and societal influences. Third, mixed methods are crucial for fostering meaningful dialogue and reflection between the study and the participants in this

artist-led practice-based research. The creative combination of these methods is not merely tools for data collection; they also play a critical role in engaging and actively involving participants in the research process. This engagement is essential in research aimed at challenging gender stereotypes and fostering a sense of agency and involvement among participants.

The use of mixed methods in this study offers various advantages. First, mixed methods facilitate the collection of profound subjective insights from individual participants through qualitative interviews and broader cultural and social insights through participatory activities. By integrating qualitative, participatory, and autoethnographic methods, the research captures diverse data types, from textual and visual to experiential and interactive. This combination enables a complex interdisciplinary investigation across multiple domains and provides the necessary tools to guide and effectively integrate these disciplines. Second, mixed methods achieve a seamless connection between theoretical research and practical application. This approach aligns conceptual frameworks, such as techno-feminism and new materialism, with practical GameArt implementations, ensuring that theoretical insights are discussed and visibly enacted and tested in real-world GameArt practice. Third, mixed methods are particularly beneficial in the dynamic settings of this research, where the interplay between technology and art can produce unexpected outcomes. Employing mixed methods provides the flexibility to adapt the research approach as new findings emerge.

4.1.2 Alpha and Beta Stages

Dividing the study into Alpha and Beta stages is a performative approach to comprehensively explore the main research questions, effectively integrating theory with practice through mixed methods. The Alpha stage lays the foundational groundwork. It includes a literature review, interviews with professionals from gaming and art fields, theoretical framework construction, prototype design and development, and internal prototype and refinement. The Beta stage contains workshops in an art context and data analysis. It applies and tests the theoretical insights and the prototype developed in the Alpha stage, which is vital for engaging directly with the target

audience, gathering feedback, and observing the prototype's impact on participants. The workshops facilitate a dynamic interactive space between the researcher, participants, and the prototype, offering rich data and insights crucial for answering the main research question. Employing the Alpha and Beta stages in the study may provide a structured yet flexible framework that accommodates deep theoretical investigation, creative experimentation, and practical application but also allow for adjustments based on feedback and findings from each step, enhancing the research's relevance and effectiveness.

4.1.3 Integration of the Practice and Theories

This study integrates interdisciplinary theories and practices, encompassing techno-feminism, new materialism, Lacan's mirror stage theory, and diverse studies on immersive technology and video game language. Specifically, techno-feminist principles, particularly those posited by Judy Wajcman, reveal technology and gender influence each other within specific sociocultural contexts [516] and emphasise the influential role of women in technology design to alter gender power dynamics in a tech-driven society [6], profoundly influence the design of this research. Furthermore, new materialist theories, especially Karen Barad's ideas on performativity and "intra-action" [136], are instrumental in the research process and analysis. These theories help bridge subjective experiences with the material world, further enhanced by integrating autoethnography. In developing the research prototype, numerous design elements draw inspiration from Lacan's mirror stage, providing a theoretical framework that uses the prototype's IVEs as a "mirror apparatus" to affect participants' self-perception. Moreover, various theories and research on immersive technology and video games's design elements significantly influence the prototype's design, including principles like the uncanny valley and body ownership, which support the effectiveness of a prototype that aims to challenge gender stereotypes among Chinese women.

4.1.4 Innovation and Experimentation in the Research Method

Innovation and experimentation are pivotal in this research due to the relative absence of direct precedents in existing studies. First, the research adopts a multidisciplinary approach, operating across video games, art, immersive technology, and techno-feminism, to explore the potential of an artist-led GameArt practice informed by techno-feminist principles in China. This approach may enrich traditional research in this interdisciplinary area by introducing novel perspectives and methods. Second, drawing on new materialist theories, this practice-based research emphasises research practice and interactions among the researcher, participants, and various materials involved in the research process. This approach advocates for continuous self-reflection from the researcher throughout the research. It also encourages more profound reflections on how materials influence and are influenced by the research process and its participants, offering novel insights for practice-based artistic research. Third, adopting performative elements such as performative survey questionnaires, role-playing, and tailored gallery setups for workshops encourages participants' interactions and facilitates the collection of rich, authentic data. Fourth, the prototype showcases innovative design at the intersection of video games, immersive technology, art creation, and techno-feminist perspectives.

4.1.5 Interrelations between Main and Sub-questions

The structuring of the main research question and four sub-questions within this study forms a comprehensive framework to evaluate the efficacy of artist-led techno-femnist GameArt practice in China.

The main research question explores how an artist-led GameArt practice informed by techno-feminist principles can provoke women who engage in interactive prototypes and workshops to reflect on gender stereotypes in China. This research utilises techno-feminist principles applied within an artist-led GameArt framework to foster reflective dialogues on socially constructed gender roles among future professionals at the nexus of technology and art. It demonstrates the

transformative potential of video game and art collaborations that embrace gender awareness, ultimately aiming to promote the participation of Chinese women in the creative technological sector.

Sub-question 1: What is GameArt practice? This foundational question aims to relocate and clarify the scope and characteristics of GameArt practice, providing a basis for conducting and refining the study's interventions. Sub-question 2: In which context could an artist-led GameArt practice informed by techno-feminist principles be effectively conducted in China? This question identifies optimal contexts for deploying the study's GameArt practices, guiding the unfolding of research and being re-evaluated through feedback from workshop participants. Sub-question 3: Can this study's VR GameArt prototype, employing a female-focused narrative and the "mirror apparatus" as design strategies, facilitate reflection among participants on gender stereotypes in China? This question focuses on assessing the prototype's effectiveness in provoking reflections on gender stereotypes in China, highlighting the transformative potential of integrating video games and art that promote gender awareness. Sub-question 4: What is the potential of an artist-led GameArt practice informed by techno-feminist principles in China? It explores the broader implications of adopting an artist-led GameArt practice, particularly through workshops that provide a platform for participants to discuss traditional female roles and societal gender expectations. This component integrates the researcher's practice within a broader socio-cultural context, playing a crucial role in encouraging Chinese women's active engagement in the creative technological sector, thus addressing the central research inquiry.

4.1.6 Target Audience

This study's target audience is mainly Chinese women[97] nterested in techno-feminism and creative technologies and desiring to engage in interdisciplinary practices, especially for students

[97] Several males and people from LGBTQ groups interested in the study also joined the workshops. It is because reflecting on gender stereotypes in China through a techno-feminist lens is not solely a women's effort; the support and assistance of all allies are also crucial.

with related backgrounds. China's diverse female population, marked by regional, cultural, and class distinctions, necessitates a focused research approach. By concentrating on a demographic at the intersection of technology, art, and feminism, the study can more accurately target the potential audience. Targeted student groups not only have a foundational understanding of this study-related fields, but their potential future involvement in these domains suggests that insights gained from this study could have a lasting impact.

4.2 Alpha Stage: Sub-section 1: Review of the Literature

The literature review in this study's Alpha stage serves dual purposes: it informs the design of the research framework and provides a theoretical basis for developing the prototype. It encompasses studies in gaming, techno-feminism, new materialism, related immersive technologies, game technology and language, and the mirror stage concept's relevance to prototype development. Resources for this review include academic books, journal articles, magazines, and online content such as video games webpage, artist websites and reviews of artworks and exhibitions.

4.3 Alpha Stage: Sub-section 2: Interviews with Industry Professionals

This study incorporated in-depth interviews with female professionals in the field of gaming and and art. In-depth interviews is a performative way to promote meaningful exchanges between the researcher and the interviewees.

Purposes:

To gain more insights on the the possibilities of applying techno-feminist GameArt practices in the gaming field in China.

To explore the reasons behind the scarcity of techno-feminist creation or practice in the gaming industry.

To collect professional advice for prototype development.

Methods:

Employing interviews as the method is major for three reasons:

In-depth interviews allow insights into the current situation of limited research on applying techno-feminist principles in GameArt practice in the gaming industry.

In-depth interviews provide detailed, personalised firsthand information, validating and enriching conclusions that the gaming field may not be conducive to developing GameArt practices informed on techno-feminist principles shortly.

Through multiple and continuous interview interactions, the study aimed to obtain professional advice and foster understanding and connection between the gaming and art fields.

Selection of Interviewees:

The selection of interviewees for this research specifically focuses on interviewing female professionals from diverse positions in the gaming industry and individuals from the art field with significant insights into the gaming-art intersection. This deliberate selection stems from the underrepresentation of women in the Chinese gaming industry, particularly in front-end development roles, and the scarcity of female professionals in the art field who are deeply engaged with gaming. Choosing representatives from various facets of the gaming sector and art professionals with profound understandings of both domains aims to ensure the diversity of perspectives and enhance the professional depth of the interviews. These participants may provide precise data and feedback for the study and leverage their industry influence to facilitate the dissemination of techno-feminist GameArt practices.

Interview Contents:

Discussions centred around the current status of women professionals in the gaming industry, the adoption of techno-feminist theories in the gaming field in China, FTGames, GameArt practices, and the researcher's prototype design.

Interview Format:

Video interviews: Spending 1 to 3 days, engaging in interviewees' life or work contexts informally as friends, collaboratively exploring the issues focused in this study while maintaining continuous documentation.

Video interviews embodies an interactive participation process, capturing discussions on research-relevant topics alongside the context and environment where these conversations occur. It may generate knowledge on the subject matter and blur the boundaries between the researcher and the interviewees. It emphasises the importance of the conversational context and setting, providing a deeper and more diverse perspective for the study. Furthermore, this method allows for a holistic presentation during the editing phase, combining the researcher's artistic language with the content closely related to the study. Therefore, video interviews serve as a vivid data source for the research and an artistic visual document for subsequent workshop materials for participants to interact with, further enriching the study's depth and breadth.

Rapid-response video interviews: Invite interviewees to provide brief and rapid responses to 21 questions in front of a camera, lasting 15–20 minutes.

The adoption of rapid-response video interviews in this study serves two primary purposes. First, it compensates for day-long tracking video interviews. Requesting brief responses to the same questions ensures the structured collection of crucial information, significantly reducing extraneous content and facilitating a streamlined analysis and comparison across participants. Second, it introduces a performative element to the research. The camera pressure and the limited time encourage respondents to spontaneously articulate their opinions, introducing an exciting performance into the data collection process, providing different perspectives from the video interviews, and balancing the dataset. Respondents' answers are edited in a single video that

visualises the performative aspect of the research. It enriches the study's data and is employed as an artistic visual document for following workshop materials for participants to interact.

Text-based interviews: These interviews are Conducted via email to discuss further issues raised during the video interview (only applied for some interviewees). Incorporating text-based interviews in this research serves to delve deeper into topics that emerged during video interviews. This method facilitates further exploration of issues identified during the interaction process, allowing for more detailed and reflective responses in written form.

Data Processing:

Audio transcripts from edited video interviews are used for analysis.

Edited video interviews are displayed as art/researche documentation in workshops and exhibitions, offering participants a more immersive context for the study.

Expected Outcomes of the Interviews:

Gain an In-depth understanding of the current situation of women and gaming in China and professionals' perspectives on the conduct possibilities of techno-feminist GameArt practices within the gaming domain.

Gain professional opinions and feedback on prototype development.

Foster connections and understanding between professionals in gaming and art fields.

4.4 Alpha Stage: Sub-section 3: Construct the Theoretical Framework

The theoretical framework combines four main aspects. First, this part provides a new understanding of GameArt practices. It also proposes new terms, which form a foundation for a

detailed examination of artist-led techno-feminist GameArt practice in China. It also grounds the investigation of the study's sub-question 1 in theory and guides the conduct of the GameArt practices within the study. Second, the theoretical framework underscores the innovative and transformative potential of conducting the artist-led techno-feminist GameArt practice in China. This part assists in comprehensively understanding the research's challenges and opportunities, identifying the conducting context of research practices, and offering theoretical support for the study's second sub-question 2. Third, addressing prototype design elements, such as female-focused narratives and applying the "mirror apparatus" as a design strategy, related to answer . This part ensures that the prototype's design is supported by interdisciplinary theories and findings, providing a detailed understanding of the prototype's role in challenging and reshaping cultural narratives. Fourth, the study's theoretical relevance to research practices is explained, forming a solid theoretical base to guide research processes and outcomes. Overall, the theoretical framework outlines the scope, defines key concepts, and establishes a structured approach for exploring conducting the artist-led techno-feminist GameArt practice in China.

4.5 Alpha Stage: Sub-section 4: Prototype Design and Establishment

4.5.1 The Purpose of Establishing a Prototype

The prototype serves two primary purposes. First, it explores applying techno-feminist principles to GameArt to provoke the experiencer's reflection on gender stereotypes in China. This endeavour addresses the lack of exploration of techno-feminist GameArt by artists in China. The prototype offers workshop participants a tangible example, given the scarcity of GameArt related to techno-feminism in China. Second, the prototype is a crucial medium for interaction between the researcher and the participants. Although the prototype is just one component of the GameArt practice, it is a direct product of the research practice, serving as the primary interface between the research practices and the public. Through the prototype, experiencers can understand and feel the characteristics, goals, and value of this artist-led techno-feminist GameArt practice artistically.

Furthermore, the method of establishing the prototype also serves as a reference for workshop participants to create their LFPs.

4.5.2 Prototype's Functions and Features Overview

(see Appendix C for prototype design details)

The prototype is named Cyber JiangHu (CJH). It is a VR application built with Unity3D for Oculus Quest 2 in Chinese and English. Unity3D is known for its widespread use in game development and facilitates artistic and personalised functionalities. It offers high compatibility with virtual assets and, therefore, provides convenience for artistic expression. The prototype offers a first-person role-playing adventure GameArt experience in a speculative, hyper-feminine, immersive techno-pink world. It confronts participants with challenges and phenomena relevant to gender stereotypes in real society in China, including nine interactive scenes, four participant routes, and three storylines. The average experience duration is 35-45 minutes.

The prototype is distinct from commercial VR games and has a unique artistic style and deep thematic exploration. Compared to existing VR art pieces, it introduces a higher level of interactivity and nonlinear narrative for participants to explore freely. These features also make it different from typical VR models for research experiments that generally focus on the functionality of the prototype to the exclusion of other elements like aesthetics or experience.

4.5.3 Prototype Theme Design

(see Appendix C: AC.2 for scene names and vocabulary correspondence table)

The prototype's theme revolves around contemporary female stereotypes in China. By establishing a series of scenarios and tasks related to women's identity construction in real society, the prototype simulates and metaphorises the impact of traditional female roles and societal gender expectations on women in China. The choice of theme for the prototype serves several purposes: First, the theme aligns with the techno-feminist principles that underpin the GameArt practice by

addressing issues related to gender, technology, and society. By examining female stereotypes, the prototype actively engages with questions of women's roles, and the societal structures that shape and reinforce these concepts. Second, by simulating scenarios that reflect real societal conditions, the prototype critiques and questions the prevailing narratives and expectations imposed on women in China. This is crucial for sparking dialogue and reflection on how these stereotypes affect women's lives, choices, and self-perceptions.

4.5.4 Characters Design

4.5.4.1 Main Character Design

The main character Xiao Mei's[98] (the participant's avatar) in the prototype, is mainly invisible to the participant. Participants encounter Xiao Mei in two ways: Concretely, through four distinct avatars in four specific mirror stages, and abstractly, through imaginative reflections triggered by the prototype's "mirror apparatus", such as the crowd NPCs comments on her. This 1PP design, necessitated by VR technology's limitations and user experience considerations, but in the prototype, it enriches the theme and narrative and aligns with Lacanian theories, allowing for a nuanced exploration of self-identity construction in a digital context.

The undefined participant's avatar also has other purposes. First, it resonates with the theme of self-exploration, laying the groundwork for participants to navigate the identity construction process reflective of fundamental societal dynamics. Second, it circumvents the direct portrayal of idealised femininity, thus avoiding the reinforcement of gender stereotypes and the potential perpetuation of societal norms. The design choice opens up a broader imaginative space for participants, allowing for a more personal and introspective engagement with the avatar. Third, the deliberate ambiguity and openness of Xiao Mei's character encourage participants to reflect critically on their process of

[98] Xiao Mei (means the young and beautiful girl) is currently one of the most preferred names for calling the female main character in Chinese movie commentary videos. Regardless of the movie, the story it tells, the name of the female protagonist, her nationality, or her ethnicity, the most common reference used in such movie explanations is Xiao Mei.

identity construction, challenging them to consider the external influences that shape their perceptions of self and others.

Participants see Xiao Mei's avatars during four specific mirror stages as follows:

Ideal Beauty

In the first specific mirror stage, participants are presented with an image on a virtual smartphone in a selfie-taking task. This avatar, as shown in Fig. 6 [506], displays characteristics deemed ideal in current Chinese societal norms—large eyes, long legs, and a charming demeanour—symbolising the cultural and societal expectations placed on women. This depiction is pivotal in shaping female identity, echoing the societal and cultural forces that mould perceptions of femininity, as literature review 2.4.2 revealed. It mirrors the digital age's "mirror stage," utilising filters to craft an idealised self-image (see 2.3.2.6) and delves into the distinct sociocultural meanings of filtered selfies in China (addressed in 3.5). Moreover, it aligns with Lacanian theory, which states that self-formation begins with the illusion of the mirror stage [285]. Overall, this avatar, coupled with the continuous task of taking selfies, represents the digital era's imagination of an idealised female under societal expectations and the efforts to achieve the ideal women made by using "neoliberal" tools of filtered selfies, suggesting an internalisation of societal stereotypes by women.

Fig. 6. The composite screenshot shows two perspectives of the Ideal Beauty avatar in Cyber JiangHu: (left) developer's global view from the project files; (right) participant's in-prototype view during gameplay. Both images were captured by Yajuan Han.

The Forsaken NPC in Robotic Form

In the second specific mirror stage, participants directly encounter the Forsaken NPC, as shown in Fig. 7 [506], a robot, within the prototype. Its actions are inversely synchronised with the participant's motion, creating a form of non-mirrored reflection inspired by literatur review in 2.3.2.7. Because The Forsaken NPC symbolises the marginal unsupervised group avatars with self-awareness, his function is to guide participants drift away from the primary task and narrative of becoming "perfect" and to explore alternative potentials. The image of a robot aligns with the protagonist Xiao Mei's narrative as a digital "avatar" of hyper-aged life in story 1, implying her artificial nature. Additionally, the inverse synchrony with the participant's motion suggests a subconscious self, intertwining with the Forsaken NPC's role as the awakening of self-awareness, symbolising an introspective understanding of self within the subconscious.

Backstage Avatars

In the third specific mirror stage, participants encounter the backstage avatar, a low-polygon humanoid model, in a virtual mirror. This avatar, as shown in Fig. 7 [506], relates to the participant's Scene 01: Assembly Lab/Outlying Island task, generated based on their responses to comments related to stereotypes of women on the participant from the crowd NPCs. These backstage avatars are visually categorised into four types, representing slim and tall, cute, sexy, and a composite of the previous three attributes, achieved by exaggerating and enlarging certain proportions of geometric shapes within the humanoid model. As one of the participant's avatar images, this exaggerated geometric body symbolises the women's internalisation of the impacts of Big Other-societal symbols and language and the disparity between their actual identities and societal expectations.

Moreover, in 3D modelling, the polygon holds a special meaning, as polygons are the fundamental unit of construction models. A low polygon model signifies a "cheaper" resource due to lesser

computational demands. Conversely, more complex textures such as “hair” imply higher computational costs, symbolising an “expensive” entity. These low-polygon humanoid models imply the fragmented self in the mirror stage with societal ideals and expectations. It contrasts with the fully hair-covered humanoid models (representing the ultimate state of perfection), standing for the imperfect and perfect.

Hairy Avatar

In the fourth specific mirror stage, participants encounter a humanoid figure fully covered in hair, as shown in Fig. 7 [506], during an out-of-body experience. This avatar is tied to the prototype’s central narrative, representing an ultimate state of “perfection” where more hair equates to greater perfection. On the one hand, it demonstrates consistency, representing perfection in the narrative, and the hairy texture is expensive in a 3D digital context. On the other hand, it embodies absurdity, ironing the blind pursuit of specific mainstream values or ideals, aiming to provoke participants to reflect on entrenched notions.

Fig. 7. The composite screenshot shows the Forsaken NPC, Backstage Avatars, and Hairy Avatar in Cyber JiangHu: (left) the participant’s in-prototype view of the Forsaken NPC during gameplay; (middle) the developer’s global view from the project files of Backstage Avatars; and (right) the participant’s in-prototype view of the Hairy Avatar during gameplay. All images were captured by Yajuan Han.

In summary, these diverse avatars serve as strategic interrupt factors, deliberately disrupting participants' perceptions through specific mirror stages in the prototype to evoke curiosity and stimulate reflective engagement. The ambiguity and openness of Xiao Mei's identity prompt participants to reflect critically on their identity formation, considering the external factors that influence self-perception. This approach may deepen engagement with themes of gender roles, encouraging thoughtful reflection on the relationship between personal agency and societal norms.

4.5.4.2 The Crowd NPCs

The design of the crowd NPCs, as shown in Fig. 8 [506], includes numerous female characters. The Asian appearance of 3D female models with features of the ideal Chinese feminine aesthetic, such as tall, fair, cute, and slim, is used as a foundation model. Based on that, they were remodelled with varying degrees of hair detail and voxelisation to represent different levels of perfection and imperfection. Visually, they navigate between realism and cartoon and between the bizarre and the relatable.

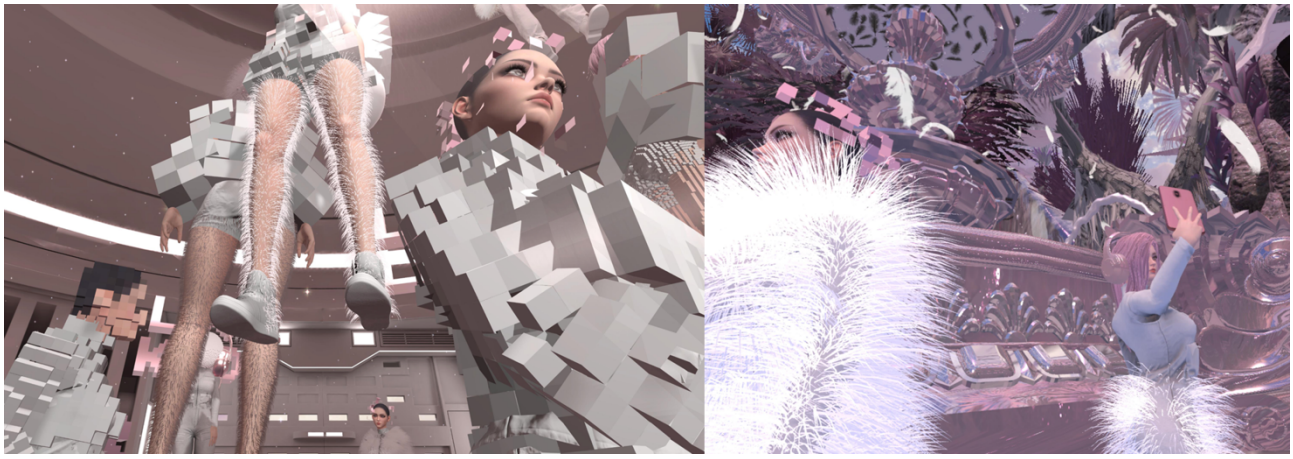

Fig. 8. This composite screenshot shows two perspectives of the crowd NPCs in Cyber JiangHu: (left) the developer's global view from the project files and (right) the participant's in-prototype view during gameplay. Images were captured by Yajuan Han.

Designing the crowd NPCs in this way is motivated by several factors: First, it aligns with the crowd NPCs' role as the "Other" in the prototype. On the one hand, reinforcing and exaggerating the stereotypical image of women within mainstream societal ideologies implies the widespread pursuit of an idealised female image in society. On the other hand, the crowd NPCs are functionally

designed as “Others” to influence the participant’s perceptions through the “group pressure” caused by collective behaviours and similar appearance. Although virtual cartoon characters are generally trusted and welcomed [427], the crowd NPCs opted for a more realistic cartoon human. It attempts to balance their appearance as humankind so that participants can regard them as “the same group” and avoid the uncanny valley effect. Second, it aligns with the expectations of the Chinese audience. Female characters in Chinese games are often visually cute and innocent. The design adopts an Asian body proportion (usually 1:7). However, it blends Western and Eastern facial features to cater to the aesthetic preferences in Chinese digital culture, underscoring the prototype’s engagement with cultural specificity. Third, using hair and voxelisation as heterogeneous elements in female models to indicate perfection and imperfection aligns with the in-prototype stories. Moreover, it also responds to the technological hierarchy represented by the appearance of digital entities in the digital space. The prototype visualises the societal pressures and ideals imposed on female identity by altering the presence of these elements. In summary, the crowd NPCs’ design results from considerations aimed at influencing participants’ perception through interaction, acting as the “Other” in the participants’ experience.

4.5.4.3 The Forsaken NPC

In the prototype, the Forsaken NPC, is a robot whose movements inversely mirror the participant’s, serving as a unique form of reflection. It diverges from the main narrative to reveal insights about the CJH and Perfect World. It acts as a catalyst for participants to critically engage with the system, offering an alternative perspective through mirrored interactions that reflect the participant’s subconscious self. The Forsaken NPC plays dual roles. It is the second specific mirroring stage, and when it synchronises with the participant’s motions inversely, it is regarded as the avatar of Xiao Mei. However, it also serves as an “Other,” designed to affect the participant’s perception and judgment by communicating information inconsistent with the Perfect World’s values. Its robotic appearance and unique ability to create reflections in the narrative underscore its role as a mirror, suggesting a journey into the subconscious self, embodying the complexities of identity and sub-consciousness in a digital age (see 4.5.4.1).

4.5.4.4 Narrators

The narrator in the prototype comprises three functional character narrators represented by different voices (see Appendix C: AC.4.2 for more details of the narrators' design; see Appendix C: AC.6.1 and AC.6.2 for narrator's scripts).

Narrator's role 1 (NR1): It represents the system, implying a symbolic authority conveys Big Other's "gaze." It is invisible, and a male voice is used to represent it.

Narrator's role 2 (NR2): It is visualised as a birthmark, representing Xiao Mei's previous Source Life, which implies a body part "inherited" from Xiao Mei's "ancestors." It is semi-tangible, using a female voice and a birthmark to represent.

Narrator's role 3 (NR3): A remnant of the consciousness of a computer scientist from Empire Valley Company (EV), representing perspective from other dimensions beyond Xiao Meri's perception. It is invisible and uses a robotic voice to represent.

This design draws inspiration from the narrator's role in The Stanley Parable [351], where the narrator opposes the player, challenging the player's decisions and provoking them to advance the narrative rather than guiding them towards choices that progress the story positively. Additionally, it is influenced by "The Beginner's Guide" [352], where the developer's intentions are profoundly embedded within the narrator, prompting players to reflect on the game world from a broader perspective, in line with the developer's worldview.

These narrator roles, originating from diverse storylines, maintain distinct connections to the main character, Xiao Mei. Their alternating presences deliver varied information to the participant, introducing a layer of unreliability. They are unreliable narrators from Xiao Mei's perspective. Therefore, the participant must actively judge from this fragmented information to navigate their way forward. These narrator roles act as a powerful connection in the communication of the participant and the creator's intentions. The circular difference between it and ordinary NPCs or props in the prototype is its "active" interaction with participants (interrupting or pushing the narrative) and its high frequency.

In the choice of voices for the three narrators, male, female, and robotic voices are respectively used. This decision reflects previous research findings that the voice of virtual humans can influence users' trust [485]; a male voice on a virtual persona can be more persuasive [419], and its impact on participants' decision-making tends to be greater than that of a female voice [411]. Therefore, NR1, embodying system authority, utilises a male voice. NR2, having a "blood" connection with Xiao Mei and requiring greater affinity, employs a female voice because female voices are more attractive than males [490]. NR3 represents a perspective beyond Xiao Mei's cognition, hence the choice of a robotic voice to create a sense of alienation. Compared to human voices, its credibility is lower [489], thus effectively conveying a dimension beyond ordinary human understanding.

Moreover, the design of the three narrator roles is also inspired by Lacan's concepts of the Imaginary, the Symbolic, and the Real, respectively. Each narrator role offers a unique lens through which the narrative interacts with these psychoanalytic registers, enriching the participant's experience and understanding of the self about the story being unfolded.

NR1 and the Symbolic

NR1, representing the system and implying symbolic authority, directly implies Lacan's concept of the Symbolic order. The Symbolic is the domain of language, law, social structure, and norms—essentially, the cultural and linguistic codes that govern society reside [285]. By conveying the Big Other's "gaze" through delivering the Code of Conduct, NR1 embodies the external authority and the social codes that participants must navigate. Using a male voice for NR1 could not only make the role more "trustworthy" and persuasive [419] but also reflect traditional societal power dynamics, where the Symbolic order is often patriarchal. NR1's role underscores the influence of societal expectations and norms on individual behaviour and thought, responding to how the Symbolic shapes and constrains subjectivity and desire within Lacan's framework.

NR2 and the Imaginary

NR2, symbolised as a birthmark representing Xiao Mei's previous Source Life, resonates with Lacan's Imaginary order. The Imaginary is associated with images, illusions, and ego formation through the mirror stage [285]. By implying a body part "inherited" from partents, this narrator role implies the Imaginary's focus on image, identity, and the reflective process of self-recognition and misrecognition. The female voice and the tangible aspect of the birthmark emphasise the personal, intimate, and image-based nature of the Imaginary, highlighting the role of internalised images and fantasies in the construction of self-identity.

NR3 and the Real

NR3, as a remnant of the consciousness of an EV's computer scientist, responds to Lacan's concept of the Real. The Real represents what eludes symbolisation entirely, aspects of existence that resist integration into the Symbolic or representation within the Imaginary [285]. By offering perspectives from dimensions beyond Xiao Mei's perception and employing a robotic voice, NR3 embodies the Real's nature as external to human understanding and perception. It leaves the hint that the presence of truths or realities beyond the participant's current comprehension or the prototype's narrative constraints attempts to arouse more profound reflections on the limits of language and the symbolic order in capturing the entirety of the human experience.

Those three narrator roles form an unreliable narrator from Xiao Mei's perspective because of their relations to Xiao Mei and the information they provide. This design choice serves a couple of functional purposes: First, they provide distinct information and orientate different positions and relationships towards the participant, which makes it look like an unreliable narrator to the participants. It may disrupt the participant's decision-making process, inviting deeper contemplation and critical evaluation of the information provided. Second, the unreliable narrator acts as an element of situated narrative storytelling, providing a unique mechanism. By presenting fragmented and often contradictory information, this design may effectively simulate the complexities of navigating multiple perspectives and sources of information in real life. Because in the prototype, the entanglement between the narrator who delivers information and the participant who acts as the receiver is highlighted and magnified, this design may challenge participants to critically evaluate the reliability of the narratives they are presented with, fostering a deeper engagement

with the content, and encouraging a critical stance towards the construction and acceptance of narratives.

This approach may not only enrich the participant's experience by adding layers of depth to the storytelling but also align with the prototype's thematic focus on questioning and reevaluating established norms and identities. By requiring participants to piece together the narrative from these unreliable fragments, the prototype might mirror the process of self-discovery and identity formation, highlighting the influence of external narratives on self-perception and the power of critical reflection in navigating these influences.

4.5.5 Focusing on Female Narratives in the Prototype

The VR GameArt prototype emphasises on female-focused narrative. It explores seven dimensions: background story, ultimate goal, scenes and tasks, situated narratives, illusions of agency, "mimesis" [449], and numerous female NPCs.

4.5.5.1 Background Story Design

There are three time-space -intersecting storylines in the prototype (see Appendix C: AC.3 for the full stories)

Story 1 The near future perspective:

The story outlines a future where humans have yet to overcome ageing, relying on biotechnology for minimal metabolic functions. In this era, hyper-aged individuals use digital meditation to maintain consciousness in avatars created by Empire Valley Company's (EV) Cyber JiangHu(CJH) application system to escape physical limitations. Due to anomalies or abandonment, imperfect avatars are usually deleted unless recycled for retraining or sold on the black market, raising ethical concerns. A significant discovery reveals some avatars awakening consciousness.

Story 2 The participant's character Xiao Mei's perspective

It is a story about Xiao Mei, who awakens on the Outlying Island with amnesia, unaware of her identity or surroundings. She is invited to undergo training at CJH to become “perfect” for entry into the Perfect World, a realm of “spirit” and “freedom.” Amidst trying to recall her past, Xiao Mei embarks on her training journey.

Story3: The developer’s intentions

The developer’s intentions are embedded in the design, especially through NR3 that aims to provoke participant’s deeper reflection on the experience of the stories encountered from a more transcendent perspective.

The prototype’s background story, composed of three cross-temporal narratives, is unfolded in a hyper-feminised future world, emphasising female narratives in both style and content. Style-wise, on the one hand, the speculative “perfect world” employs elements closely associated with feminine aesthetics or sociocultural meanings, such as techno-pink colours, cuteness, fuzzy textures. These elements not only intuitively connect with female preferences and continue and adhere to the researcher’s existing artistic style but also challenge the mainstream masculine stereotypes of the future; on the other hand, exploring contemporary issues women face through the lens of science fiction responds to Donna Haraway’s concept of constructing alternative techno-feminist narratives through “SF” [450, p.31]. It encourages participants to step outside entrenched social gender stereotypes about women and observe from a distance, resonating with Haraway’s proposal of techno-feminism as a significant practice method.

Content-wise, the background stories integrate three cross-temporal narratives to highlight the complex layers of female identity and experience. First, Xiao Mei’s story immerses participants in a journey of self-discovery and societal critique, reflecting on the pressures to conform to idealised femininity. The near-future narrative introduces a technological dystopia that parallels contemporary societal issues, such as ageing and identity, through the lens of techno-feminist critiques. Third, the developer’s intentions imply a “meta-narrative,” encouraging participants to associate the prototype’s world with real-life situations and promoting a deeper reflection on gender, technology, and autonomy.

In summary, the background story design aims to enhance engagement by allowing participants to delve into a multilayered narrative, fostering critical reflection on the pressures and expectations women face in real society in relation to gender stereotypes, and encouraging participants to be active contributors to the narrative and interpret their narratives.

4.5.5.2 Ultimate Goal

The ultimate goal in the prototype, centred around the unconventional concept of attaining "perfection" through the accumulation of body hair, critically interrogates and subverts the conventional societal norms dictating female beauty and identity. By setting Xiao Mei's quest within a speculative, hyper-feminised future, the design ingeniously contrasts the societal derision of female body hair against the "expensive" digital pursuit of hair realism, thereby exposing the illogical standards of beauty. This paradox not only questions the societal pressures on women caused by gender stereotypes but also highlights the absurdity of conforming to such arbitrary standards. The design challenges participants to reconsider the reliability of entrenched stereotypes, thus advancing a critical examination of gender roles and societal norms and inviting them to further reflect on the constructs of female beauty and the impact of societal expectations on self-perception.

4.5.5.3 Scenes and Tasks

The prototype has nine scenes and multiple tasks crafted to closely mirror scenarios pivotal to the construction of female identity, embedding a profound engagement with female-focused narratives. By incorporating tasks such as filtered selfies and decision-making under group pressure, the design not only situates participants within contexts that reflect real-world challenges and societal expectations faced by women, facilitating a critical exploration of these issues through interactive and immersive experiences but also addresses the impact of digital technology and social media on women's self-perception and societal image, thereby invoking a critique of the surveillance and self-discipline mechanisms inherent in neoliberal technologies. This methodology aligns with the broader aims of the study to foster reflection on the nuanced dynamics of female perceptions of identity construction within a techno-feminist framework.

4.5.5.4 Situated Narrative

The design of situated narrative is inspired by Donna Haraway's "situated knowledge" [7], [363], focusing on the complexity of female narratives within a multifaceted storytelling structure. By embedding three nested timelines, employing non-linear storytelling, offering four participant paths (see four paths in Appendix C: AC.1), and incorporating the unreliable narrator, the prototype attempts to dismantle the traditional, male-dominated grand narrative, emphasising the richness of diverse experiences and perceptions that emerge from interaction with specific environments instead.

The situated narrative is designed in several ways. First, the three timelines respond to the multiplicity of perspectives inherent in situated knowledge, acknowledging that every narrative fragment can be regarded as knowledge or truth within a specific context. Second, offering four distinct routes driven by participant choices simulates real-life complexities in forming female identities, underlining the influence of societal, cultural, and technological factors on individual agency and self-perception in a digital age. Third, the unreliable narrator in the prototype implies the subjective nature of knowledge and perception. These elements disrupt the singular, authoritative narrative voice, reflecting the multiplicity and partiality of truths in understanding female identities, provoking the participants to question and critically assess the information presented. Fourth, the design of specific mirror stages metaphorically reflects the participant's journey towards self-discovery and critique of societal impacts. The disconnected "self-images" from these stages, breaking the grand narrative, offer an opportunity for participants to confront and reflect upon the constructed nature of female identity (see below 4.5.6.3).

4.5.5.5 Illusions of Owning Agency

The prototype endeavours to reveal to participants that their perceived control over its narrative is, in fact, an illusion tightly regulated by the system's coding. For example, in the scene01 - Assembly Lab/Outlying Island, as shown in Fig. 9 [506], the platform on which the participant stands only rises when the participant continually accepts comments laden with gender stereotypes (see Appendix C: AC.6.3 for the crowd NPCs's comments), enabling them to reach a button that

triggers the next level. This scenario design manipulates gaming conventions and expectations around task completion, setting up a critical choice between conforming to stereotypes or advancing in the game. However, It is not so apparent to participants that rejecting these stereotypes does not conclude the experience but opens up an alternative pathway to Scene06 Return Null/Dungeon. And then, even on this alternate path, the prototype's final scene09, Eternal Return, hints at entering another set of rule systems. This design not only addresses the inequalities brought about by the systemic "black box" of technological spaces, emphasising the necessity for participants to continuously reflect on the (technological) systems/world they are immersed in, but also reflects the moral responsibility of developers in techno-feminist GameArt practice. Moreover, it metaphorically represents the real-life situation of women, guiding the experience towards deeper contemplation of the roots of the formulating process of current female roles.

Fig. 9. The composite screenshot shows scene01- Assembly Lab/Outlying Island in Cyber JiangHu where the participant experiences receiving comments with stereotypes from the crowd NPCs: (top) developer's global view from the project files; (left) the button at the top to induce the participant to click, from the participant's in-prototype view during gameplay; (right) the interaction panel for the participant to choose whether to accept the comments or not, from the participant's in-prototype view during gameplay. All images were captured by Yajuan Han.

4.5.5.6 "Mimesis"

The prototype integrates Luce Irigaray's concept of "mimesis" as a foundational design principle, utilising strategic mimicry to critique and deconstruct the patriarchal symbolic order that marginalises or suppresses female experience and expression [449]. This application of "mimesis" is manifest in the prototype's use of hyper-feminine aesthetics, exaggerated depictions of

femininity, and the ironic reversal of traditionally masculine domains to create a space where stereotypical identities are both engaged and subverted.

Techno-pink

The prototype adopts a visual and thematic language steeped in extreme femininity, such as using the pervasive techno-pink and soft, hairy textures to challenge the male-dominated sci-fi genre's aesthetics. Such a hyper-feminine world combined with pink's ambiguous representation nowadays, the colour pink and its relationship with femininity becomes a question that participants cannot avoid. This choice reflects a mimetic strategy that exposes and critiques the limitations and constructs imposed on female identity by a male-centric society.

Feather Weapon:

The design of using a soft feather as a weapon, as shown in Fig. 10 [506], to destroy the system centre (scene06 Return Null/Dungeon) embodies "mimesis" [449] by mimicking and then subverting the patriarchal symbolic order. The design is also inspired by artist Pipilotti Rist's "rose weapon" in Ever is Over All (1997) [508]. By transforming an object traditionally associated with femininity into a tool of empowerment and resistance, this design subverts gendered expectations—where gentleness becomes strength. This act of defiance, feasible only within the VR environment, offers a startling juxtaposition against real-world constraints, emphasising the virtual space's potential for reimagining gender roles and expressions, highlighting the virtual space's potential for reimagining gender roles and expressions. Moreover, this design attempts to critique and disrupt the dominant narrative that equates femininity with weakness and passivity. It emphasises female agency by inviting participants to perform this destroy acting with the feature weapon, which makes the feature become a metaphor for the transformative potential of reimagining feminine qualities as sources of power.

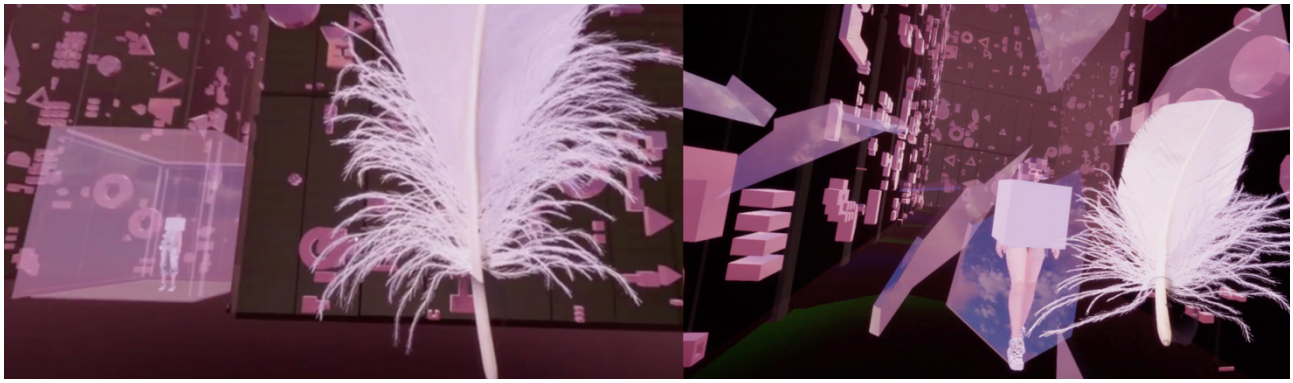

Fig. 10. The composite screenshot shows the “Feather Weapon” in Cyber JiangHu from the participant’s in-prototype view during gameplay. Both images were captured by Yajuan Han.

Exaggerated Symbols associated with women

In the Temple scene (scene03 Fetishism CPU 1&2 /Temple 1&2), a symbol of sanctity, its design leverages “mimesis” [449] to critique “neoliberal” consumer [38]-[40] that encourages the restoration of feminine attributes through investment and consumption, thereby contributing to economic growth pursuits [43], [44] by using exaggerated representations of materialist symbols prevalent in women’s lives, such as handbags, high heels and cosmetics. Simultaneously, it juxtaposes these exaggerated symbols against the traditionally solemn and sacred, challenging the validity of societal norms and the absurdity of materialistic ideals, inviting participants to reflect on the authenticity and implications of societal standards imposed on women.

Ironic Code of Conduct

The Ironic Code of Conduct in the prototype extends the “mimesis” [449] concept, emphasising its ironic nature to create content and form conflict, resulting in a strong sense of absurdity that provokes questioning. Delivered by NR1 as participants enter Scene02, its design related to “mimesis” is reflected in two main aspects. First, on a macro level, it embodies the notion of “speaking nonsense with a straight face.” As an authoritative rule within the game, the Code of Conduct demands seriousness and rigour. It represents obligations, responsibilities, and territorial boundaries. The prototype’s Ironic Code of Conduct employs this formal and strict format, delivered with a convincing male voice, to present seriously. However, its content and expression are filled with mockery and satire towards stereotypical notions of gender, technology, and the cute aesthetic. Utilising an authoritative form to amplify content that shouldn’t conventionally belong

induces a profound sense of absurdity, thereby triggering reflections on the rationality of socially constructed gender roles.

Second, at a detail level, it incorporates zany [435] elements. In designing the specific content of the rules, many clauses use experimental results from research in technologies or theoretical findings for persuasive authority. Yet, the latter parts of these clauses are designed either as humorous reversals of the previously solid results and theories or as nonsensical interpretations of the consequences of not fulfilling certain obligations. Therefore, although participants are expected to observe the Ironic Code of Conduct, which is intricately linked to the prototype's narrative and tasks, the layering of absurdity, zany, and irony from a broad perspective down to minute details invites a deeper examination of its authority and credibility, challenging participants to navigate and question the constructed overarching system of rules (see Appendix C: AC.6.1 for Code of Conduct).

4.5.5.7 Numerous Female NPCs (the Crowd NPCs)

Asian female characters with idealised Chinese feminine aesthetics are chosen for the crowd NPCs' model base; variations in hair and voxelisation denote perfection levels. These female models' designs navigate between realism and cartoon, balancing the bizarre and the relatable. They serve as the "Other," exaggerating stereotypical images to highlight societal pressures and the pursuit of Ideal Beauty in China. The choice of more realistic cartoon humans over full cartoons enhances their human-like sense. It also attempts to avoid the uncanny valley, aligning with Chinese players' expectations and engaging with cultural specificity (see 4.5.4.2).

The inclusion of numerous female NPCs serves multiple purposes. First, emphasising female NPCs within the prototype's narrative and interaction mechanisms responds to the need for more diversified and meaningful female roles in works that adopt the game language. Female NPCs are positioned as "Others" to exert group pressure, which is crucial in influencing Xiao Mei's self-identity and advancing the narrative. This approach reacts to the lack of representation and interaction of female characters, as well as issues of over-sexualisation, marginalisation, or their presence as secondary elements within male-centred narratives [375]-[380], [405], [502].

Second, depicting female NPCs with attributes reflecting idealised cultural beauty aligns with the prototype's thematic focus on female narratives. Presenting these characters in a way that reinforces and exaggerates gender stereotypes of female beauty within the virtual space highlights the universality and impact of societal expectations on female roles.Third, employing hair and voxelisation to represent varying levels of perfection and imperfection in these female NPCs' bodies is an attempt to visualise digital materiality and value within a broader discourse. Visually encoding these characters with symbols of perfection and imperfection visualises the impact of societal expectations on the construction of women's roles.

4.5.6 Employing the "Mirror Apparatus" in the Prototype

The prototype attempts to create a "mirror apparatus," in which various "mirrors" are designed to better support participants in reflecting on female self-perception, identity, and social interactions. Inspired by the Apparatus theory, where the film screen is a mirror [301], the prototype metaphors its VR GameArt environment as a "mirror apparatus" to explore female positioning issues in China (adressed in 3.4). Specifically, the prototype embodies this "mirror apparatus" by designing "reflection" elements such as the Other and the Big Other, the avatar, and specific mirror stages.

4.5.6.1 Designing the Other and Big Other for "Reflections"

The VR GameArt prototype attempts to integrate Lacan's concepts of the Other and the Big Other into the "mirror apparatus" design. By using the crowd NPCs and the Forsaken NPC to embody the Other, group pressure is exerted on the participant through the crowd NPCs' group behaviour and appearance. The Forsaken NPC plays a dual role. It represents the second specific mirror stage, and when its movements mirror the participant in reverse, it is seen as Xiao Mei's avatar. Simultaneously, it acts as an "Other," aimed at influencing the participant's perception and decision-making by conveying messages contradicting the Perfect World's values. To the participants, the Forsaken NPC's identity largely depends on their interactions with it and their subjective experience. Through these interactions, these NPCs may function as pressure from

others and societal gaze, mirroring the external forces that shape women's self-perception and identity in the real world.

The Big Other is manifested through the systemic elements of the prototype, such as the tasks, gameplay, rules, and the symbolic representation of authority. Specifically, tasks, gameplay and rules are systemic designs that highlight the omnipresent nature of the Big Other and are embedded in participants' whole experience. Introducing a techno-feminist perspective to critique and disrupt traditional male-dominated game narratives in the systemic design may challenge participants to reflect on the role of societal norms in shaping female perceptions and identity. Regarding the symbolic gaze of the Big Other [327], the NR1 conveys that the CJH Code of Conduct contains societal norms and expectations and is designed as an authority symbol, functioning as an authority "gaze" that attempts to influence participant behaviour and decision-making, echoing Lacan's notion that our desires, taboos, and norms are shaped by a more significant societal system [285].

Integrating these Lacanian concepts into the prototype's design may not only enrich the participant's engagement with the narrative but also emphasise the constructed nature of female identity within a sociocultural framework. The "mirror apparatus" of the prototype attempts to be a space for participants to confront and question the influence of the Other and the Big Other on their self-perception, encouraging a more profound reflection on socially constructed female roles.

4.5.6.2 Designing the Avatar for "Reflections"

Research shows that the player's avatar often can have a significant impact on the participant, especially in VR environment through the illusion of body ownership (see 2.3.1.3). However, in the prototype, the participant's avatar (the main character Xiao Mei) is invisible to the participant most of the time, and its "reflections"/impacts are associated with interactions with the Other, the Big Other, specific mirror stages, and tangled with the whole prototype environment and system.

4.5.6.3 Designing the Specific Mirror Stages for "Reflections"

In the VR GameArt prototype's "mirror apparatus," four specific mirror stages, as shown in Fig. 11 [506], are designed to explore self-perception and identity within interactive IVEs.

Fig. 11. The composite screenshot shows the four specific mirror stages in Cyber JiangHu from the participant's in-prototype view during gameplay: (left top) the first specific mirror stage; (right top) the second specific mirror stage; (left bottom) the third specific mirror stage; (right bottom) the fourth specific mirror stage. All images were captured by Yajuan Han.

The First Specific Mirror Stage - Filtered selfies: It digitalises Lacan's mirror stage concept, initiating the "self" formation through engagement with a virtual avatar's reflected image. Participants encounter the Ideal Beauty avatar (see 4.5.4.1) as an embodiment of societal expectations and cultural standards of female beauty, especially within Chinese context. This stage parallels the act of taking filtered selfies in the digital age, where users present an idealised self-image curated to meet societal norms. This act metaphors Lacan's illusion of a unified, autonomous self while offering a reflective space to contemplate the gap between one's real self

and the idealised, socially constructed persona. By making selfie-taking a recurring task, this mirror stage not only addresses the aesthetic labour involved in maintaining an ideal “I” but also connects with the “clock-in” behaviour, a specific cultural phenomenon in China. This design choice aims to deepen participant engagement by embedding the activity within a broader cultural and immersive context, highlighting the complex interplay between digital self-representation, societal expectations, and individual identity construction.

The Second Specific Mirror stage - the Forsaken NPC: By synchronising the Forsaken NPC’s motions with the participant’s movements, this stage creates a unique form of “reflection” that diverges from traditional mirroring. This non-mirror reflection attempts to metaphor a deeper layer of self by not only the reverse motion synchronisation but also the association with The Forsaken NPC’s role setting- entities with awakening consciousness awareness. As participants see their actions mirrored in a virtual other, it may create extra layers of the complexities of self-identification and the influence of external perceptions in the digital age.

The Third Specific Mirror Stage - Virtual Mirror: The virtual mirror directly incorporates a traditional mirror’s function, allowing participants to see their avatars, which is a common and effective approach adopted by many previous studies in researching self-recognition [267]-[270] and body ownership [222], [240], [244], [246], [252], [256], [257], [261], [271]. This stage grounds the experience in the physical reality of looking into a mirror [300], associating with Lacan’s original concept of the mirror stage in a digital context. However, the reflected images are Backstage Avatars, and their appearance is related to the participant’s acceptance of stereotypical comments from the crowd NPCs in Scene 01 (see 4.5.4.1). Coupled with other “self-images” reflected in other specific mirror stages, it may cause a fracture in self-recognition, contradicting the continuity of self-expected in the common understanding of mirrors, potentially prompting further curiosity and reflection. This design may realise the prototype’s “mirror apparatus” to influence the participant through crowd NPCs as the Other and interconnect potential causes through events and tasks, which also responds to Lacan’s theory on the Other’s impact on identity construction and self-perception.

The Fourth Specific Mirror Stage – the Out-of-Body experience: This stage extends the exploration of self-perception by placing participants in an out-of-body experience, where they observe their avatar from a third-person perspective. This dramatic shift in perspective disrupts traditional self-identification processes, which may offer a unique opportunity to reflect on the self as an object within a broader social and virtual context. This stage embodies the objectification of the subject and metaphors an external Lacanian “mirror” [311], [322].

4.5.7 The Prototype’s Aesthetics

Visually, the prototype continues the artist’s consistent aesthetic style while incorporating sociologically significant elements and symbols like cuteness, pink, bling bling, and hairy texture. These elements are integrated into the interactive system, imbuing them with new semantics and attempting to establish a hyper-feminised immersive experience. Moreover, these factors are employed in the design of characters, props, and settings. The aim is to utilise extreme feminisation, materialisation, and cute aesthetics to hint at the absurdity and unreliability of the system behind its representation. Therefore, participants are provoked to question the significance of their actions within this system.

Choosing techno-pink as a primary colour tone in the prototype has a few reasons. First, it used techno-pink to subvert the pretrial of male-dominated futures. Traditionally, science fiction and futuristic visions have dominated male perspectives, often characterised by metallic, cold hues that signify a sterile, technology-driven future. The infusion of pink into this domain attempts to respond to Irigaray’s concept of “Mimesis” [449]. Second, it is also an attempt to challenge stereotypes of technology. Pink’s association with femininity is well-established, yet its linkage with technology, especially within the context of gaming and VR, confronts a stereotype that technology is inherently masculine or gender-neutral. By embracing techno-pink, the prototype deliberately provokes a reconsideration of gender’s role in technological spaces, questioning the exclusionary practices that have historically marginalised women in tech fields. Third, it is because of the ambiguity and fluidity of pink’s interoperation. In contemporary culture, pink embodies complex meanings that

transcend simple gender binaries. While historically tied to femininity, pink has been reappropriated and resigned in various contexts, from feminist movements to genderqueer identity expressions. The use of techno-pink in the prototype leverages this ambiguity, employing the colour not just as a visual marker of femininity but as a symbol of resistance, empowerment, and fluidity.

The incorporation of cuteness into the prototype, aligned with Luce Irigaray's "Mimesis" [449], serves as a tactical inversion of the conventional, often masculine, perceptions of technology. Through embedding the aesthetic of cuteness—a characteristic traditionally marginalised within the hierarchy of artistic severe and technological expressions. In the context of China, the cute aesthetic carries nuanced meanings that imply "superficial" and "minor" [438], extending beyond a mere visual appeal to embody a complex interplay of gender, culture, and social expectations (see 2.4.3.2). Moreover, the cute aesthetic is also aligned with the researcher's personal artistic language as an artist. By challenging the subordinate status of cuteness within Chinese aesthetics, the prototype attempts to critique the relegation of feminine expressions to the periphery of cultural significance and reclaims and elevates these expressions as powerful means of artistic and technological engagement.

Choosing hairy textures is for a few reasons: Aesthetically, it enhances the cute aesthetic; socioculturally, it may subtly challenge societal norms concerning female body hair, especially highlighted by the "Kiwi Girl" concept. It also mirrors the valuation criteria for virtual assets within a technological framework. Hence, the prototype utilises hair not merely for aesthetic appeal but to visualisation various levels of perfection and imperfection, thus participating in discussions on female body image and societal expectations.

Similarly, the use of Bling Bling visually complements the cute aesthetic while also referencing materialism and consumerism specific to China's sociocultural situation. Particularly in Scene03: Fetishism CPU1&2 / Temple1&2, it significantly underscores and expands upon themes of consumerism and materialism. Moreover, it also is a continuity of the researcher's artistic style.

4.5.8 The Prototype's Overall Expressive Style

The prototype's expression method is subtle and irony. irony is inspired by Luce Irigaray's concept of "mimesis" [449]. The indirect expression might differ from the direct and intense styles often employed in existing techno-feminist GameArt works, like those by Angela Washko and Lena NW. It is primarily because a subtle and indirect expression might be more in line with Chinese cultural habits and acceptance. Moreover, it meets the prototype's goal of connecting and attracting more participants, maintains the openness of the speculative concepts and world constructed by the researcher, and aligns with the artist's consistent creative language.

4.5.9 Prototype Development Phases

The prototype development is divided into three stages: Design, internal testing, and refinement. This process can ensure a comprehensive approach to creating the prototype. Initially, the design stage lays the foundation with conceptual and functional frameworks. The internal testing phase then allows for identifying any issues or areas for improvement, ensuring the prototype's functionality and user experience align with the intended goals. Finally, the refinement stage addresses these insights, polishing the prototype for optimal performance and usability.

4.5.10 Prototype Experience and Data Collection

The data collection methodology for the prototype encompasses audio-recorded group discussions, video recordings of workshop activities, and performative survey questionnaires designed to deepen the engagement between participants, the prototype, and the researcher. This multifaceted strategy is crucial for capturing rich, immersive interactions and fostering a space for real-time communication and collective reflection.

Audio-recorded group discussions are instrumental in capturing the participants' reactions and reflections, offering a qualitative depth that reveals the intricacies of their engagement with the

prototype. This method allows for a nuanced analysis of verbal expressions, capturing the diversity of participant experiences and insights.

Video recordings of the workshops play a pivotal role in responding to “situated knowledge” [7], [363] within the context of new materialism. By documenting the dynamic interplay between participants and the prototype within the workshop environment, this visual data provides critical contextual information, enabling the researcher to observe and analyse the material conditions and embodied experiences that shape participant interactions.

The performative survey questionnaire is designed as a performative tool intended to enhance participants' interactions with the prototype and their reflections on workshop activities. It is conducted online and includes participants from both within and outside the workshops. Considering the involvement of a broader audience, the questions are designed to be inclusive and provoke broader reflection on issues faced by women in China, using general terms about women's issues rather than focusing solely on Chinese gender stereotypes. The questionnaire is divided into two sections: one for participants who only experienced the prototype and another for those who attended the workshops (all of whom experienced the prototype). In this study, the performative survey questionnaire serves merely as a tool to foster interaction and reflection. The data collected are used as a reference for the researcher to reflect on the research process rather than for quantitative analysis.

4.6 Alpha Stage: Sub-section 5: Internal Prototype Testing and Refinement

The internal prototype testing and refinement in research’s Alpha stage is designed to incorporate feedback from professionals who bring experience and insights to the project. This phase attempts to enhance the prototype by identifying and resolving technical and design issues, optimising the user experience, and ensuring the prototype’s overall quality. This approach is guided by new materialist perspectives, focusing on the material conditions and relational dynamics that shape

technological development and user experience. By involving professionals in the testing and refinement stage, the prototype becomes a site of collaborative knowledge production, where expert insights contribute to the iterative improvement of the project. Moreover, inviting some previously interviewed professionals to this stage can also help with ongoing exchange and strengthen community-building. This stage aims to obtain expert suggestions for improvement, ensure prototype quality, identify and fix any technical or design issues, and optimise user experience, ensuring the project's success and maximising its value.

4.7 Beta Stage: Sub-section 1: Workshops in the Art Context

4.7.1 The Purposes of Workshops

Workshops, as a crucial component in this study, serve dual roles intricately woven into the fabric of the research's objectives. First, they are a part of the researcher's GameArt practice, facilitating the forming of a space to have reflective dialogues of socially constructed gender roles among future professionals at the intersection of technology and art. Second, workshops function as a critical observational field, providing a lens through which to examine and evaluate the potential and efficacy of artist-led techno-feminist GameArt practices in China, providing rich data and insights that inform the main research questions directly.

The purposes of the workshops are: 1) to create a space for reflective dialogues of socially constructed gender roles among future professionals at the intersection of technology and art. 2) provide participants with direct experience and understanding of the artist-led techno-feminist GameArt practice; 3) establish an egalitarian and collaborative space for interaction and learning by inviting participants to create their GameArt LFPs. 4) evaluate the potential and efficacy of artist-led techno-feminist GameArt practices in China.

The workshops are held in art schools and institutions, not only because the art context provides a better environment for techno-feminist GameArt practice but also because the study attempts to

anchor techno-feminist practice in China through experiential learning and collaborative creation in a broader audience. These workshops can offer participants hands-on experience and deepen their understanding of GameArt as a transformative tool. In particular, inviting participants to make LFPs makes them not just passively receive knowledge but active contributors to the techno-feminism GameArt practice in China.

4.7.2 Workshops' Relationship with Main and Sub Research Questions

The workshops conducted within the art context play a crucial role in addressing the research questions, providing a fertile ground for generating vital data and insights through workshop activities such as collective discussions and creating LFPs. By delving into what constitutes GameArt practice (Sub-question 1), workshops act as live laboratories where participants interact with GameArt and practice tools and technologies, offering practical insights into GameArt practice's methodologies and applications in China. These interactions, observed within the workshops, not only serve as empirical example evidence but also enrich the concept of GameArt practice. Workshops offer scenarios to assess the viability of conducting artist-led techno-feminist GameArt practices in China (Sub-question 2), providing a microcosm of the broader societal and cultural context. The research gauges the receptivity and adaptability of artist-led techno-feminist GameArt practice in China through workshops. The prototype is designed to engage with female-focused narratives and the "mirror apparatus" concept (). Experiencing the prototype is a crucial activity in workshops. Workshops serve as critical experimental apparatus to support the participant in engaging and interacting with the prototype. Observing these interactions is instrumental in assessing the prototype's effectiveness as a reflective tool. Finally, the workshops may facilitate a dynamic exploration of the potential of the artist-led techno-feminist GameArt practice (Sub-question 4). By fostering a space for collaboration, creativity, and critical discourse, the workshops enabled a more in-depth understanding of techno-feminism and GameArt practices.

4.7.3 Workshop Activities and Process Design

4.7.3.1 Workshops at Three Locations

Workshops are conducted in London, Nanjing, and Beijing to：

Discuss gender stereotypes in China across different environment backgrounds for more comprehensive feedback.

Increase audience diversity, with London hosting many Chinese female oversea students and Nanjing and Beijing representing different cultures in northern and southern China, enhancing data representativeness.

4.7.3.2 Main Activities in the Workshops

The workshops' main activities include: Lectures, prototype experiences, group discussions, making LFPs, visiting the exhibition, and interacting with the researcher's prototype project file or research materials (each workshop varies). Workshop content is designed and adjusted for each location's audience to meet their needs better, increasing research depth and impact.

4.7.3.3 Recruitment of Participants

The participants group are mainly Chinese women aged 18 and above. They should be able to experience VR and be interested in video games, art, feminism, or creative technologies for female expression. Students majoring in creative technology are preferred. On the one hand, this demographic will likely have a foundational knowledge of creative technologies. Their familiarity with digital tools, video games, and art provides a solid basis for engaging with the techno-feminist GameArt practices explored in the study. This prior knowledge is crucial for deeper engagement and meaningful interaction with the research materials and activities. On the other hand, students majoring in creative technology are on a path to becoming future professionals. By involving them in the study, there is an opportunity to influence and shape the next generation of techno-feminist practitioners. These individuals will likely carry forward the principles and practices of techno-feminism in their future careers, amplifying the impact of the study's findings and contributing to a broader societal change. Choosing this group of participants aims to maximise the study's

relevance and impact. Their engagement is not only beneficial for the research outcomes but also for their personal and professional development, furthering the cause of techno-feminism in the realm of creative technology.

4.7.3.4 Recruitment Methods

Direct invitations using the researcher and her supervisors' networks.

Recruitment through Chinese student unions at higher education institutions, relevant professors, and campus advertisements.

Posting recruitment information on cooperating art institutions' websites and social media.

Announcements on the researcher's personal art website and social media.

4.7.3.5 Evolution of Workshops in Three Locations

The London workshop, held at Goldsmiths, University of London's VR lab, spans two days, including six 2 to 2.5-hour sessions each, mainly targeting Chinese female international students majoring or interested in video games, art, feminism or creative technologies. Primary activities include lectures, prototype experiences, group discussions, research documents and materials sharing, and the performative survey questionnaires.

The Nanjing workshop lasts one day, with two sessions of about 4 hours each at Espoir Gallery, primarily for Chinese women interested in video games, art, feminism or creative technologies. As Nanjing's public is less familiar with techno feminism and GameArt practice, background introductions and case sharing are added to the lectures, with more specific discussion outlines provided in group discussions. Moreover, there are also adjustments in duration and process because of the location difference.

The Beijing workshop, held over two days at Taikang Space, a non-profit art organisation, consists of two sessions of around 6 hours each, targeting Chinese women majoring or interested in video

games, art, feminism or creative technologies. Based on experiences from the London and Nanjing workshops, the Beijing workshop adds role-playing, exhibition visits, interactions with artists' creative props, and low-fidelity prototype creation.

Adjusting the workshops has a few reasons. First, each location has different resources and conditions that impact the workshop's format and execution. For example, the availability of venues and equipment significantly affects the number of participants and workshop activities. Designing workshops according to different conditions optimises resource use. Second, London, Nanjing, and Beijing's cultural and contextual distinctions influence participant demographics, requiring workshop content adjustments to align better with the participants. Third, modifications to each workshop are based on reflections on previous workshops, aiming to enrich interactions and benefits for both participants and the researcher. Therefore, adjusting workshop content is a practical and strategic requirement (see 5.3 for conducting the workshops).

4.7.4 Data Collection and Feedback Mechanisms in the Workshop

Data collected in the workshops provide crucial information for addressing the study's primary and sub-questions. The data types include group discussions, LFPs created by participants, and performative survey questionnaire results.

4.7.4.1 Group Discussions

Group discussions focus on the prototype, techno-feminism, GameArt practices, workshop experience, and community-building (see Appendix E for guiding questions).

In London, discussions involved ten guiding questions and started after participants experienced the prototype, allowing for relatively free discussion. The researcher also participated and provided feedback simultaneously.

Nanjing's discussions involved 21 detailed questions conducted in small groups of 3-4 people after experiencing the prototype, with partial participation and feedback from the researcher. Questions were refined to provide better guidance for participants, considering the general unfamiliarity with techno-feminism and GameArt practice in Nanjing.

Beijing workshops used Nanjing's question outlines but divided discussions into two parts: one focusing on prototype-related questions in pairs after experiencing the prototype and another on techno-feminism, GameArt, workshops, and communities in groups of 3-4 people after creating LFPs. The researcher did not participate in discussions directly but provided consolidated feedback afterwards.

All group discussions were audio-recorded for analysis.

4.7.4.2 Creating Low-Fidelity Prototypes (LFPs)

Participants in Beijing workshops made LFPs. After experiencing the prototype, participants formed groups of 3-4 to create LFPs. This process included brainstorming, interacting with props from the researcher's prototype files, making a group presentation, and providing feedback to each other, with technical and methodological support from the researcher during the whole process. Collected data included the LFPs themselves and participants' explanations of the LFPs, mainly through photos and transcripts of audio recordings, which are organised and analysed later.

4.7.4.3 Performative Survey Questionnaires

Performative survey questionnaires are conducted online, collecting answers from workshop participants and non-participants. The data included responses from both groups, aiding in establishing deeper connections and reflections in workshops and providing insights for the researcher to reflect on and observe the prototype and workshops.

4.7.5 Difference between Workshops and Art Therapy

This study's workshops differ from art therapy. First, the focus and goals differ: art therapy emphasises individual improvement, aiming to promote emotional, psychological, and social well-being using art as a therapeutic tool. In contrast, this study's workshops focus on forming a reflective dialogues of socially constructed gender roles among future professionals at the intersection of technology and art. Second, the roles and qualifications of facilitators differ: art therapists are usually specially trained and certified with in-depth knowledge of psychology, human development, and art therapy techniques, whereas the workshop facilitator in this study is the artist, providing references through her creative practices, guiding, showing tools and resources, and shaping techno-feminist GameArt practice in China with the participants together. Third, art therapy usually has a specific structure; the process is often open and exploratory, tailored to individual needs, where activities and exercises aim to promote emotional and psychological well-being. While this study's workshops have a predetermined agenda and structure, covering specific themes or skills, all are designed to deepen participants' understanding of techno-feminist GameArt practice and encourage the exploration of its new forms. Fourth, the settings and environments differ: art therapy usually occurs in clinical or counselling contexts like hospitals, rehabilitation centres, or private clinics. This study's workshops are conducted in the art school and institutions, which is a standard method for artists to interact with the public; for example, German artist Joseph Beuys often interacted with the public through lectures, discussions, and workshops, jointly exploring concepts of social change. Therefore, although this research's workshops and art therapy involve creative processes and participant interaction, they significantly differ in focus, purpose, process, and context.

4.8 Beta Stage: Sub-section 2: Data Analysis

4.8.1 Data Involved in This Research

Primary Data:

Interviews with industry professionals.

Participants' group discussions in the workshops.

LFPs made by workshops' participants.

Referential Data：

Performative survey questionnaries.

Video recordings of the workshops.

4.8.2 Data Involved in Each Sub-question and Analysis Methods

4.8.2.1 Data Involved in Sub-question 1 and Analysis Methods

To answer sub-question 1: What is GameArt practice? The study employs a combination of theory, practice, and feedback to address it. The theoretical aspect includes the literature review, case studies, and theoretical analysis. The practical aspect mainly involves the researcher's prototype creation, feedback from participants in the workshop's group discussions, participants' creation of LFPs, and performative survey questionnaires as reference materials for the researcher to reflect on the research process.

The reasons are: First, the theoretical part is essential for clarifying concepts and categories and ensuring the accuracy of the study's development. Second, through the researcher's prototype establishing, the practical aspect provides a concrete case for the theory. Third, feedback from group discussions in workshops about the prototype examines participants' understanding and acceptance of this medium. Fourth, LFPs created in workshops enrich the content and form of GameArt practice in China. Fifth, performative survey questionnaires promote participants' further interaction and reflection and deepen the researcher's reflection on the study's conducting.

In summary, the answer to sub-question 1 aims to define the core characteristics and scope of GameArt practice and guide subsequent practice. Then, subsequent practice and participants'

involvement and feedback enrich the content and form of GameArt practice and provide new references for its manifestation and methods.

4.8.2.2 Data Involved in Sub-question 2 and Analysis Methods

To answer sub-question 2: In which context could an artist-led GameArt practice informed by techno-feminist principles be effectively conducted in China? The study employs a combination of theory, practice, and feedback to address Sub-question 2. The theoretical aspect covers stages including literature review and theoretical analysis. The practical aspect includes interviews with industry professionals in the gaming and art field, collecting opinions and feedback from participants in workshop activities, and performative survey questionnaires as reference materials for the researcher to reflect on the research process.

Employing this approach is for several reasons: First, the theoretical analysis provides an understanding of China's culture, society, and their interplay with video games, art and feminism, offering background and direction for subsequent research practice. Second, interviews with professionals can provide insights into specific challenges and opportunities for conducting techno-feminist GameArt practice in China and valuable advice for prototype development. Third, feedback from the workshop participants can deliver an understanding of the potential for conducting feminist GameArt practice in the art context. Fourth, performative surveys can encourage further thinking among participants, providing multiple perspectives for the study.The answer to sub-question 2 would provide the specific context for conducting the study's GameArt practice, guiding the choice of context for later research practice.

4.8.2.3 Data Involved in Sub-question 3 and Analysis Methods

To answer Sub-question 3: Can this study's VR GameArt prototype, employing a female-focused narrative and the "mirror apparatus" as design strategies, facilitate reflection among participants on gender stereotypes in China? The study uses a combination of theory, practice, and feedback to address Sub-question 3, including literature review, prototype creation, inviting participants to experience the prototype and collect feedback, and performative survey questionnaires as reference materials for the researcher to reflect on the research process. The study explores one

possible form of techno-feminist GameArt in China and assesses its impact through participants' feedback on the prototype, which provides a concrete case reference for the main research question.

The rationale for this design strategy encompasses several key aspects: First, from a theoretical standpoint, the study offers a thorough examination of issues surrounding Chinese female identity and positioning, ensuring the research's accuracy and relevance. Simultaneously, it reviews and analyses studies on immersive technology and gaming language's potential effects on participants' cognition. Utilising the "mirror apparatus" as a conceptual framework aids in understanding self-perceptions, providing theoretical groundwork for the prototype's development. Second, the practical dimension of creating the prototype focuses on females and employing the "mirror apparatus" to facilitate participants' reflections on gender stereotypes in China. Third, involving participants in the prototype experience and gathering their feedback aims to gauge the prototype's effectiveness in promoting reflections on socially constructed gender roles in China. Fourth, conducting the performative survey questionnaires may further elucidate participants' responses and deepen the researcher's understanding of their feedback.

In summary, sub-question 3 examines how specific prototype designs prompt reflections on gender stereotypes in China. This inquiry covers both design exploration and methodological approaches, as well as evaluating the impact of these designs and methods through participant feedback.

4.8.2.4 Data Involved in Sub-question 4 and Analysis Methods

To address Sub-question 4: What is the potential of an artist-led GameArt practice informed by techno-feminist principles in China? The study integrates theory and practice through organising art workshops, instructing on GameArt practice methods, enabling participants to create LFPs, collecting feedback via group discussions, and performative survey questionnaires as reference materials for the researcher to reflect on the research process.

The rationale behind this approach is multifaceted: First, the workshops offer participants an example of artist-led techno-feminist GameArt, enhancing their grasp of its fundamental principles

and ideas. Second, imparting GameArt practice methods empowers participants to transition from passive observers to active creators, thereby deepening their engagement with these techniques and addressing the shortfall of female agency in Chinese feminist discourse. Third, the LFPs created by participants embody their understanding and application of techno-feminist principles, providing invaluable primary data for the study. This process encourages participants to innovate, broadening GameArt practice's conceptual and thematic scope in the social-cultural context of China. Fourth, group discussions and performative survey questionnaires yield a spectrum of feedback, facilitating the evaluation of the artist-led techno-feminist GameArt practice's viability in China.

In summary, sub-question 4 assesses the potential of artist-led techno-feminist GameArt practice in China. Its findings are associated with sub-questions 1, 2, and 3 outcomes, contribute to a comprehensive understanding of the primary research question.

4.9 Ethical Considerations

The study takes the following measures to protect participants' privacy and data:

Thoroughly communicated the research purpose and significance to participants, offered comprehensive information sheets, and ensured participants provided informed consent after fully understanding the project's scope.

Data was collected anonymously, except for interviews with professionals. All personal and institutional names mentioned in this thesis have been used with the consent of the individuals or the respective institutions' heads.

Explained the utilisation of photography and videography in the participant information sheets and secured participants' consent at the beginning of the workshops.
(See information sheet and participant consent form in Annex D).

4.10 Anticipated Challenges and Solutions in the Research

First, techno-feminism and Game Art practice may be relatively new concepts for Chinese audiences, and the complicated relationships between feminism, gaming, and art in China are challenging. Moreover, diverse public attitudes towards these fields may add extra difficulties.

Solutions: To address this, a tangible prototype was developed for participants to engage directly. Workshops introduced concepts and methods, enhancing participants' understanding and firsthand experience of techno-feminist GameArt practice. Additionally, lectures and exhibitions offered access to relevant research literature and materials, enriching participants' comprehension of GameArt practice and techno-feminism. Moreover, the targeted recruitment efforts aimed to attract the study's primary audience.

Second, the prototype's design and development presented obstacles due to limited resources and constraints associated with 3D and VR technology.

Solutions: The prototype design simplified fur textures and prioritised code-controlled motion to minimise reliance on animation, streamlining the development process.

Third, conducting workshops faced hurdles such as limited funding and personnel, the necessity of hosting workshops in various locations, and challenges related to insufficient VR equipment and participants' unfamiliarity with VR technology.

Solutions: Leveraged existing resources and secured external support from art institutions and educational facilities. Workshops included detailed explanations of the prototype's operations to accommodate participants' needs.

4.11 Expected Research Outcomes and Results

4.11.1 Expected Research Outcomes

The expected outcomes of this research encompass five aspects:

New Concepts:

GameArt practice, GameArt, and GameArt Apparatus.

Practical Works:

The researcher's VR GameArt prototype.

LFPs created by participants during workshops.

Research Documentation:

Transcripts of interviews with female professionals in gaming and art fields.

Prototype design details.

Visual and textual documentation of the workshop cunducting.

Performative survey questionaries report.

Research Data:

Interviews with professionals.

Participants' group discussions in the workshops.

LFPs made by workshops' participants.

4.11.2 Expected Research Results

The expected results of this study are: First, GameArt practice is a form of performative worlding activity. Second, the art field provides a better environment for conducting the artist-led techno-feminist GameArt practice in China, compared with the gaming field. Third, the prototype, designed

with a focus on female narratives and employing a "mirror apparatus", can effectively provoke participants' reflections on gender stereotypes in China. Fourth, using workshops within an art context as a component, the artist-led techno-feminist GameArt practice has significant potential to influence participants' perceptions of socially constructed gender roles. Consequently, these results may lead to the conclusion that the use of GameArt as a practice holds the potential to influence participants' perceptions of traditional gender roles in China.

4.12 The Artist Identity and This Study

In this research, the researcher’s artist identity and experiences are pivotal, influencing the research methodology and content and infusing the project with unique perspectives and innovative methodologies. By integrating art with cross-disciplinary knowledge to produce the prototype and conduct workshops, the researcher/artist acts as a conduit between theory and practice, providing rich, experiential insights and utilising her influence in the art world to draw attention to specific issues. The research process also significantly contributes to the artist’s personal and professional growth, enriching her understanding of her work, honing her skills and project management capabilities, unlocking new career paths, and expanding her creative horizons. Moreover, the artist can engage in societal discussions through research findings, enhancing art’s societal role.

4.13 Potential Research Limitations

The study's potential limitations include: The research is embedded within artistic practice, which might limit its applicability in more traditional or technologically focused settings. The study relies on a specific group of participants whose demographics might not reflect the broader population in China. The specific design of the GameArt practice used in the study may also limit the applicability of the findings. Moreover, since the study addresses gender stereotypes within China, a particular cultural and societal context, the findings might not translate directly to other cultural or national contexts where gender roles and the reception of techno-feminist ideas differ significantly.

Chapter 5: Practice

Chapter Introduction

The practice chapter primarily explains the research practice conducting process. It mainly includes interviews with professionals and prototype-making in the Alpha phase and the conduction of workshops in art institutions in the Beta stage. These practical activities form a crucial part of addressing the four sub-questions for this study. Therefore, the practice chapter details the specific execution of these activities. Then, at the end of the chapter, it elucidates the processes and methods utilised in addressing the four sub-questions.

5.1 Conducting Interviews with Industry Professionals

5.1.1 Interviewees

This study interviewed eight female industry professionals, seven from the gaming industry and one from the art field. All interviewees are passionate about video games and art and are experienced gamers themselves. The participants comprised an independent game developer who has published video games and won a Steam award, a founder and frontend developer of a small gaming company, two co-founders of a company specialising in FTGames, a technical artist from a leading Chinese gaming company, a renowned game streamer (who also worked for gaming company in position of game planning and marketing), a game media critic, and an art curator with a deep interest in the application of game language in creative practices.

5.1.2 Conducting Interviews

The interviews with industry professionals were conducted based on the design outlined in the methodology. From establishing connections and initial preparations to filming, organising raw

materials, and editing video content, the process spanned approximately six months intermittently. All eight respondents participated in rapid-response video interviews, seven additionally undergoing video interviews. Also, three respondents engaged in text-based interviews. Continuous interaction through video and text interviews provided vital information for the research and facilitated dialogue between the gaming and art fields, enhancing understanding.

5.1.3 Challenges and Solutions in the Interview Process

The main challenge with video interviews was the high time and energy cost of organisation, data collection, and conducting. To address this, the researcher chose typical scenarios and events in the interviewees' lives to film over 1-3 days, combining this with the same-day shooting of brief answer videos. Also, the video materials were used as data and artistic documentation in workshops and related exhibitions; thus, not only are the materials utilised to their fullest potential, but they also provides a more nuanced context and became a vital component of the research context for the workshop participants and a broader audience who are interested in this area to understand the situated conditions of these explorations.

5.1.4 Post-Interview Interactions with Participants

The researcher and interviewees engaged in continuous interaction, mutually immersing themselves in each other's lives and work and engaging in deep discussions on issues related to video games, art, and women. Post-interview interactions include some interviewees participating in internal testing of the research prototype, providing professional feedback, and attending workshops and exhibitions. Meanwhile, the researcher attended some interviewees' events, such as their talks or lectures.

5.1.5 Interview Experience and Suggestions

Interviews with industry professionals provide the research with ample and diverse data. These interviews' video and audio documentation better restore the context of knowledge production. However, it demands high requirements on the researcher's multiple skills such as planning, communication, equipment use, shooting, editing skills, and investment of time and energy. Therefore, special attention needs to be paid to these requirements when considering using a similar approach.

5.2 Developing the VR GameArt Prototype

5.2.1 Prototype Development Process

The prototype development was divided into three stages: Design, development, and internal testing and refinement. All three stages were conducted, and the final developed prototype is generally in line with this study's expectations of prototype design purpose. (see Appendix C for the prototype's design details)

Design stage:
The researcher designed the prototype's theme, worldview, background stories, gameplay, characters, dialogues, and scenes. In the design process, the researcher continually discussed and revised design details with her supervisors.

Development Phase: The researcher collaborated with a programmer who handled the prototype's systemic programming, such as the selfie function, and ensured the experiencer's choices impacted subsequent scenes. The researcher was responsible for the rest, including scenes, animations, models, dialogues, voice-overs, translations, and code for simple interactions. The prototype was ultimately developed as a bilingual (English and Chinese) VR application for

computers using Unity, compatible with the Oculus Quest2 VR headset, with an average experience duration of 35 to 45 minutes.

Internal Testing and Refinement Phase:

A small-scale internal test was conducted with eight professionals participating (including the researcher's supervisors and practitioners from the gaming and art industry). The test primarily invited participants to experience the prototype individually at the researcher's workplace or home. Essential feedback included VR-induced dizziness and difficulties in the ladder interaction. Based on the feedback, a teleport function was added to the prototype so that the participant could move from one location to another faster and reduce the uncomfortable feeling caused by walking in the VR for too long. In the moment of the out-of-body, camera movement with the participant's perspective was set to linear mode to reduce the dizziness; one ladder interaction was replaced with a portal, therefore reducing the difficulty of interaction and ensuring participants could access the third selfie-task location; another ladder was adjusted to trigger an automatic scene transition if participants cannot climb up to the ladder within two minutes, which is also to enable every participant can enter the next scene. Additionally, the prototype underwent overall resource optimisation to save computing resources and reduce runtime lags.

5.2.2 Final Functional Realisation and Adjustments

In the final version of the prototype, adjustments were made to the original design following internal testing, including a reduction in the use of fur texture due to technical constraints, while ensuring that the overall artistic expression of the work remained largely unaffected. The most significant modifications of the fur texture were made to the appearance of crowd NPCs and specific scene props, aimed at reducing the computational demands.

Due to technical and financial limitations, the crowd NPCs in the original design were simplified to only feature body animations without facial expressions when interacting with the participant in Scene01.

Additionally, the backstage avatars generated by the participant's acceptance of crowd NPCs' comments were streamlined into four distinct categories due to similar constraints, simplifying the original concept where each principal comment would affect a different aspect of a backstage avatar's appearance based on the participant's response.

Despite software optimisations aimed at reducing runtime energy consumption, the program still necessitated high computer specifications for optimal performance. As a result, high-performance computers equipped with Graphics Processing Unit (GPU) configurations of 3080 or higher were selected to run the prototype, ensuring an enhanced participants' experience.

5.3 Conducting the Workshops

5.3.1 Overview of Workshop Conducting

The workshops conducted across the three locations generally achieved their intended purpose of creating a space for participants to discuss and examine traditional female roles and societal gender expectations in China. (see Appendix D for more workshop conducting documentation; see Annex C for the workshop video)

A total of 10 workshops were held:

6 in London, 2 in Nanjing, and 2 in Beijing, with a total participation of 48 people (21 in London, 7 in Nanjing, 20 in Beijing).

Participation in main workshop activities:

Lectures: 21 in London, 7 in Nanjing, 20 in Beijing.

Prototype experience in the workshop: 21 in London, 7 in Nanjing, 20 in Beijing.

Group discussions: 21 in London, 7 in Nanjing, 18 in Beijing.

Low-fidelity prototype making: 18 participants in Beijing workshops.

Performative survey questionaries: 21 in London, 7 in Nanjing, 20 in Beijing.

5.3.2 London Workshops

5.3.2.1 London Workshop Activities, Interactions, and Participant Performances

Fig. 12. The composite photo of the London workshops illustrates two aspects: (left) a participant experiencing the prototype and taking a selfie and (right) a group discussion. Photos were taken by Liu Mingyang for research purposes.

Duration: Two days, with 1 workshop in the morning and 2 in the afternoon each day, totalling 6 workshops of around 2-2.5 hours each.

Participants: 2-5 people per workshop, totalling 21 participants (17 women, 2 LGBTQ, 2 men), mainly Chinese students, with 21 participating in group discussions.

Location: VR Lab at Goldsmiths, University of London, equipped with VR devices and classrooms.

Equipment and materials: 4 computers with VR devices, 2 additional computers for display research documents and materials, and participant usage, Wi-Fi, projector, printed information sheets, consent forms, pens and paper, workshop identifiers, souvenirs, etc.

Registration: Participants chose to write their preferred names from pink, blue, or black name tags. These colours sparked discussions on gender stereotypes among some participants.

Text materials: Printed and electronic versions of participant information sheets, consent forms, and VR risk explanations were provided. Participants exhibited a preference for printed versions.

Lectures: The lecture constitutes the first main activity in the workshop, conducted in a classroom connected to the VR Lab. The researcher uses a PowerPoint presentation with text, images, and videos projected onto a large screen in the classroom to introduce the background, objectives, methods, prototype technology of the study, the workshop's process, a brief introduction of techno-feminism, and contemporary GameArt practice. The lecture segment sparked considerable interest among the participants in this research, leading to ongoing discussions with the researcher after the workshop.

Prototype experience: Following the lecture, the prototype experience is a vital activity where the researcher first explains the use of VR, the functions of the controller buttons, and safety precautions in detail to the participants. Subsequently, participants are led into the adjacent VR Lab to experience the prototype simultaneously. The experience duration for different workshops ranged from 35 to 45 minutes.

Group discussions: Recorded by audio, participants showed high engagement and enjoyed the free discussion environment. They extended the preset topics to related issues based on participants ' responses and interactions.

The Performative survey questionnaire: This segment, arranged after the group discussions, aims to enhance participants' interaction with the study and foster deep reflection on the themes addressed in the research. The questionnaires were provided online, with most participants completing them on their smartphones and a few on computers, averaging 27 minutes.

Research documents and materials: These materials were made available on two other computers in the classroom and stored online, accessible to participants via links. These resources included previous interviews with industry professionals, links to contemporary GameArt practice creators, the researcher's website, and a reading list related to the research. Approximately one-fifth of the participants chose to stay after the workshop activities to check these materials, while others noted down the links for later access.

Souvenirs: Souvenirs are printed tote bags with "Unsupervised Avatar." It was given to participants at the end of the workshop. The attendees showed a high degree of likeness to these tote bags.

5.3.2.2 Preliminary Observations of the London Workshops

London workshop participants are generally highly engaged in the research theme and workshop activities.

Interests and Backgrounds of Participants:

Most participants at the London workshops were Chinese students in London. They are already familiar with the concept of techno-feminism and GameArt. Many of them are interested in feminist topics and mentioned it as their primary motivation for attending the workshop. Their familiarity likely stems from their educational backgrounds overseas, which may provide a more objective understanding and attitudes towards feminism. Additionally, their academic or professional involvement in fields related to technology and art has significantly contributed to their interest and understanding of this study.

Group Discussion Sessions:

The group discussion was characterised by spontaneity, with participants showing high engagement levels. This dynamic interaction led to a rich exchange of ideas and perspectives among the participants. The workshop in London facilitated a highly collaborative environment where individuals felt comfortable sharing personal experiences and viewpoints related to this

research's themes. During the discussions, the researcher assumed the role of a participant rather than just a facilitator, engaging in discussions and providing positive feedback.

Prototype Experience:

Participants showed a keen interest in the prototype and were eager for a comprehensive experience. Given the prototype's four routes, some initially explored just one path, but upon learning about the other options, nearly all expressed a desire to explore further. Their exploration within the prototype world was marked by significant initiative and engagement. Additionally, since the experiences occurred in a shared room, participants often communicated with those nearby, sharing insights from the prototype or seeking assistance with specific tasks. The majority navigated the experience independently, though a few required additional guidance from the researcher. A small number experienced mild dizziness, with a few pausing briefly before resuming. Overall, the VR equipment's potential for inducing dizziness did not prevent participants from completing the prototype experience but suggested the need for extra patience and time from both participants and the researcher.

The Performative survey questionnaire:

The Performative survey questionnaire segment is designed to enhance participants' interaction with the study and foster deep reflection on the themes addressed in the research. This section took longer than anticipated, partly due to some open-ended questions in the questionnaires and partly because participants were highly engaged and provided thoughtful responses.

Workshop Props and Gifts:

Participants responded positively to name tags and souvenir tote bag, suggesting such detail might encourage engagement.

5.3.2.3 Preliminary Evaluation and Reflections on London Workshops

The London workshop unfolded smoothly, with full and active participation from attendees. It formed a space that facilitates participants' discussions and examinations of traditional female roles and societal gender expectations in China. Moreover, the selection of participants interested

in video games, feminism, and art, especially students, laid the groundwork for the effective delivery of the workshop.

Nonetheless, the workshop revealed opportunities for enhancement. First, an extension of the workshop duration is necessary as activities like the prototype experience, discussions, and questionnaires exceeded expected timeframes. Post-workshop interactions, lasting upwards of around 30 minutes for some participants, suggest additional time per session or expanded intervals between workshops, reducing the researcher's workload and accommodating participants better. The compact schedule was primarily dictated by venue availability, necessitating a multifaceted compromise. Second, participants expressed significant interest in the prototype's technology and design, engaging in active dialogue with the researcher and inquiring about technical specifics for potential application in their project. This curiosity also extended to the researcher's creative process and fostered a reciprocal exchange enriched by the participants' learning and professional backgrounds with insights into technology and its applications. A more in-depth exploration of methods of using GameArt as a practice could thus enhance participant outcomes. Third, Interest in Research documents and materials was relatively high. However, actual post-workshop consultation was limited, likely due to the convenience of accessing provided links later. This points to the potential benefit of a more engaging presentation format for those materials. Improvements in these areas were incorporated in subsequent workshops in Nanjing and Beijing, addressing the identified needs for extended time, deeper technological insights, and enhanced document presentation.

5.3.3 Nanjing Workshops

5.3.3.1 Nanjing Workshop Activities, Interactions, and Participant Performances

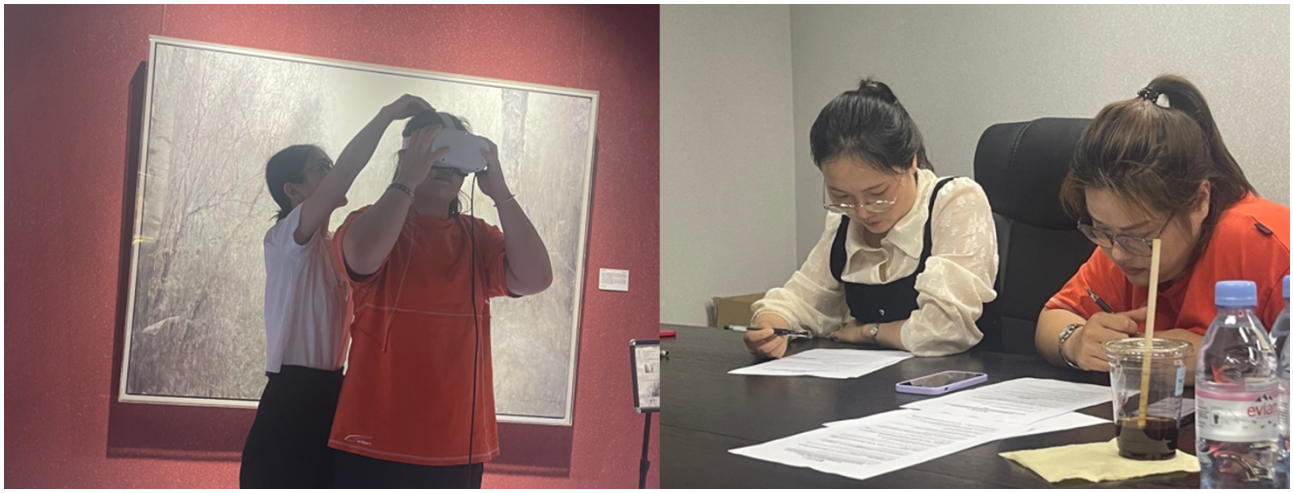

Fig. 13. The composite photo of the Nanjing workshops illustrates two aspects: (left) a participant experiencing the prototype and (right) a group discussion. Photos were taken by Ruan Xiaoyi for research purposes.

Duration: One day, 2 sessions of 4 hours each.

Participants: 7 women who are interested in art or games.

Location: Espoir Gallery in Nanjing, utilising their exhibition space and a meeting room.

Equipment and Materials: 2 VR setups, Wi-Fi, projector, paper and pens, printed participant information sheets, consent forms, workshop souvenirs, etc.

Process Adjustments:

Each workshop duration was extended to 4 hours.

A detailed introduction to the backgrounds of techno-feminism and GameArt practice and case studies were added to the lecture.

The detailed group discussion outlines were provided, increasing to 21 questions.

Group discussions were conducted in small groups of 2-3 people, with the researcher occasionally joining to offer help and feedback.

The performative survey questionnaire was modified, reducing open-ended and increasing multiple-choice questions.

Participants were invited to check research documents and materials while they waited to experience the prototype.

Text Materials: Printed and electronic versions of participant information sheets, consent forms, and VR risk explanations were provided, with a preference for printed versions.

Lectures: The Nanjing workshop's first main activity was lectures. It was delivered in the gallery's conference room via PowerPoint projections, these sessions provided a more detailed introduction to techno-feminism and GameArt practice case studies than the London workshop. Around half of the participants expressed interest in the discussed techno-feminist GameArt examples, seeking further information on the creators and their websites, which the researcher addressed promptly during the presentation.

Prototype Experience: The prototype exploration in the gallery's exhibition area utilised two VR setups for groups of one to two participants each. The researcher first explains the use of VR, the functions of the controller buttons, and safety precautions in detail to the participants. And then, as one group engaged with the prototype, the other reviewed research documentation and related materials while waiting. This segment captivated most attendees, although only a third independently navigated and operate the prototype. More than half needed additional direction and technical help from the researcher, with a notable few heavily reliant on guidance for subsequent steps. A small fraction felt mild dizziness, not detracting from the experience. On average, participants spent between 35 to 50 minutes interacting with the prototype, demonstrating varying levels of engagement and exploration.

Group Discussions: Group discussions took place in the conference room, with participants divided into groups of two to four to discuss independently while the researcher partially engaged, providing feedback to participants' inquiries. Each group's discussion was audio-recorded, and

from the data, it is evident that participants engaged in thorough discussions based on an outline for each topic, with each group's discussion time exceeding the planned duration.

The Performative survey questionnaire: Due to modifying the questionnaires to include more multiple-choice questions, the average time participants spent on this segment was around 12 minutes, which aligns closely with expectations.

Research documents and materials: Most participants reviewed the documents and materials while waiting for their prototype experience, with about one-third posing questions, especially regarding interview videos. They exhibited significant curiosity towards the interviewed game industry professionals, particularly female developers.

Souvenirs: The printed tote bags with "Unsupervised Avatar" were popular.

5.3.3.2 Preliminary Observations of Nanjing Workshops

First, most participants in the Nanjing workshops were unfamiliar with the concepts of techno-feminism and GameArt. They are predominantly employed professionals rather than student groups. They are interested in art, gaming, VR, or feminism but have little exposure to interdisciplinary research or creative practices. This lack of familiarity was evident from the numerous questions raised during lectures, particularly about techno-feminism and the need for further explanations during group discussions. This situation aligns with expectations for the Nanjing workshops, possibly due to Nanjing's status as a second-tier city in China, where familiarity with techno-feminism and GameArt is lower than in bigger cities like Beijing. Additionally, the participants' fields of work were not directly related to creative technologies. While they showed interest in video games, art, VR, and feminism, their engagement with these fields, especially in applying techno-feminist principles to the creative technology sector, was limited. Despite these challenges in understanding the research theme, their enthusiasm for discussing stereotypical women's roles in China remained undiminished.

Second, during the group discussion, participants showed high engagement and rigour. They strictly adhere to the guiding questions during the group discussion. The researcher is partially involved in their discussions. Compared to London workshop participants, discussions on traditional female roles and societal gender expectations in China among Nanjing participants were more radical. It is possibly, as one participant said, “due to limited opportunities for deep reflection on these issues in daily life,” with the workshop offering a chance and space for such discussions.

Third, most participants showed high interest in the prototype experience. However, in practice, besides a few familiar with gaming and VR mediums who completed the experience independently and exhibited strong exploratory drives, many required constant guidance from the researcher. Moreover, over half explored different prototype paths, while the rest completed only one main route. This outcome may be attributable to multiple factors: although they were curious about the prototype experience, they were unfamiliar with VR and required considerable assistance for first-time use. Some participants’ reliance on the researcher’s guidance might stem from expectations of unlocking tasks and quickly completing the video game, leading to task-oriented behaviour. A minority of participants experienced dizziness, which might have affected their willingness to explore other paths. The cause of dizziness is primarily due to individual differences.

5.3.3.3 Preliminary Evaluation and Reflections on Nanjing Workshops

The conduct of the Nanjing workshops was primarily met expectations. It formed a space that facilitates participants' discussions and examinations of traditional female roles and societal gender expectations in China. Reflections on the Nanjing workshops highlight several areas:

Adjustments to workshop contents:

Adjustments were made for the workshops because there are only two VR devices in Nanjing, which necessitated a rational arrangement of workshop activities and content to utilise resources better. Also, adjustments were based on expectations of regions and demographics. By enriching the lecture’s content with more background information, the lecture gives more detailed information about the context of this research. Moreover, the results of the group discussions show that the

detailed question outlines provided in group discussions effectively guided and stimulated deeper thinking and discussion among participants. Although the detailed guiding questions left less room for participants' free explorations, these questions successfully made participants' discussions focused on the research theme, making the discussions more targeted. These adjustments are also founded on reflecting on previous workshop experiences, such as workshop duration and presentation of documents and materials. These adjustments proved suitable for the Nanjing workshops.

Participant Background:

Although the participants had deep reflections on traditional female roles and societal gender expectations in China and brought new insights into techno-feminism and GameArt practices, their future engagement in applying techno-feminist principles in the creative technology sector might be limited, which could prevent maximising the workshop's value. Therefore, future workshops in Beijing may focus on targeting potential and actual users of creative technology, especially students entering creative technology fields like in London workshops.

Workshop Venue:

The choice of a gallery venue in Nanjing was strategic, aiming to leverage the generally positive reception of art contexts in China to enrich the study's diversity and resource access. The gallery setting not only encouraged participants to engage with the workshops more earnestly but also utilised the gallery's role as a bridge to the public, facilitating deeper discussions on women's issues. Additionally, the artist's identity was crucial in both organising and recruiting for the workshop, as artist-led workshops in galleries are a common practice that supports artists' projects. Galleries offered not just a space but also support in organisation and logistics. Nevertheless, the Nanjing gallery's physical conditions were less than ideal for the workshop's activities, and its artistic direction, particularly the ongoing exhibitions not related to the workshop, could have influenced the thematic exploration. To mitigate these issues, the Beijing workshops were conducted in a non-profit art organisation, where related exhibitions better aligned with the workshop themes, improving thematic cohesion.

Dedicated Time for Research Documents and Materials:

Setting aside specific time for participants to review research documents and materials resulted in more attention compared to the London workshops. However, the presentation remained simple; a more immersive context could enhance understanding of the research's theme and stimulate comprehensive reflection. This aspect was improved in the Beijing workshops.

5.3.4 Beijing Workshops

5.3.4.1 Beijing Workshop Activities, Interactions, and Participant Performances

Duration: Two days, two workshops, approximately 6 hours each.

Participants: 20 attendees (17 women, 3 men), with 18 (15 women, 3 men) participating in all workshop activities. 2 female participants did not join the group discussions and LFPs making. The participant group mainly comprised students related to art, design, and digital technology. The first workshop primarily attracted those interested in VR, while the second workshop saw more participants interested in feminist issues.

Location: Taikang Space, a non-profit art institution, in Beijing. The workshop used the exhibition space (for the prototype experience), a meeting room (for lectures), and a public activity space (for LFP making).

Equipment and Materials: 5 computers with VR setups (1 as a backup), Wi-Fi, a projector, a monitor, paper, pens, craft tools, 2 shared computers, complimentary lunch, printed participant information sheets, consent forms, souvenirs, etc.

Process Adjustments:

The workshop added the LFP-making section.

The workshop was extended to 6 hours, with lectures and prototype experiences in the morning and the LFP-making section in the afternoon.

Split group discussions into two sessions: Morning group discussions focused on prototype experiences with participants forming pairs; afternoon discussions on techno-feminist GameArt practices and community-building, with participants in the same groups as for LFP making (3-4 people per group).

Questions and Answers (Q&A) sessions were added after each group discussion.

Enriched activities with role-playing, selfie props, exhibition visiting, and specialised navigation and explanations for the exhibition.

Role-Playing:

In the recruitment, participants were encouraged to cosplay as characters of their choice to attend the workshop. Moreover, many selfie props were prepared in the workshop to enhance performative interactions. This approach received positive responses from some participants. For example, a participant dressed up as Snow White and utilised the character during workshop activities. Some participants discussed the relationship between role-playing and the workshop's theme. Additionally, the selfie props prepared for the workshop were well-received, with participants actively interacting with them.

Text Materials:

The workshop provided printed and electronic versions of participant information sheets, consent forms, and VR risk explanations, with a preference for printed versions.

Lectures:

The lecture segment, as shown in Fig. 14, took place in the meeting room on the third floor of the Taikang Space. It extended the in-depth introduction to the research background and presentation method seen in the Nanjing workshops. The methodology of this study and the technical details of

prototype production sparked interest among participants, leading to further discussions with the researcher about the workshop's artistic props in subsequent interactions.

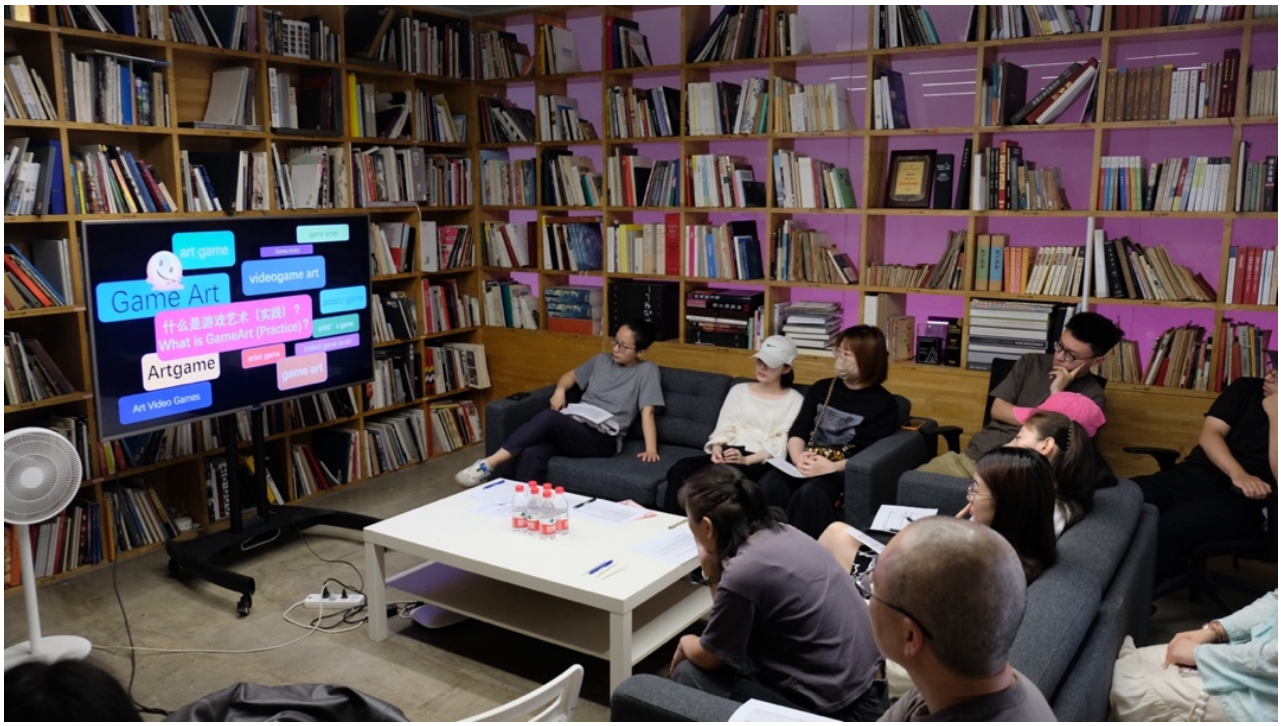

Fig. 14. The photo shows the Lecture section in the Beijing workshop. The photo was taken by You Jiadi for research purposes.

Exhibition Visits:

The exhibition, as shown in Fig.15, was set up in the exhibition space on the first floor in Taikang Space. Surrounding the theme and prototype of the research, the researcher presented related literature and materials in the form of artworks in the exhibition hall, offering a fully immersive context for the workshop. After completing the lecture, participants were guided to the first-floor exhibition hall, where some visited the exhibition while others experienced the prototype, later swapping roles. Participants generally reported that the exhibition enhanced their comprehensive understanding of the research theme.

Fig. 15. The composite photo of the Beijing workshops illustrates two aspects: (left) participants visiting the exhibition and (right) video interviews with industry professionals displayed during the exhibition. The photos were taken by You Jiadi for research purposes.

Prototype Experience:

The prototype experience, as shown in Fig. 16, was set up in the exhibition area's primary space, serving as the focal interactive zone of the exhibition with 5 computers with VR setups (1 as a backup). Most participants showed high interest in this segment and were able to complete operations and exploration independently. Many participants enjoy interacting and communicating with others nearby during the experience. At the same time, the groups visiting exhibition also liked to come over occasionally to watch those who were experiencing the prototype. Some participants experienced mild dizziness, but it did not affect the overall experience. The average duration of the experience was approximately 35 to 45 minutes.

Fig. 16. The photo shows participants experiencing the prototype in the Beijing workshop. The photo was taken by You Jiadi for research purposes.

LFPs-Making:

The making LFPs section, as shown in Fig. 17, took place in the public activity room on the second floor in Taikang Space in the afternoon. The researcher first provided a detailed introduction and explanation of methods and tools and a reference list (see Appendix F for LFPs making Toolkit). Participants were then divided into groups (3-4people) freely to work on prototype creation in different work areas. The researcher circulated among groups to discuss and offer assistance during this process. After completion, groups took turns presenting and explaining their LFPs, as shown in Fig. 18, exchanging feedback with other groups and the researcher. Furthermore, participants' LFPs were displayed in the exhibition hall alongside the researcher's works for dialogue after the workshop concluded.

Fig. 17. The photo shows participants making LFPs in the Beijing workshop. The photo was taken by You Jiadi for research purposes.

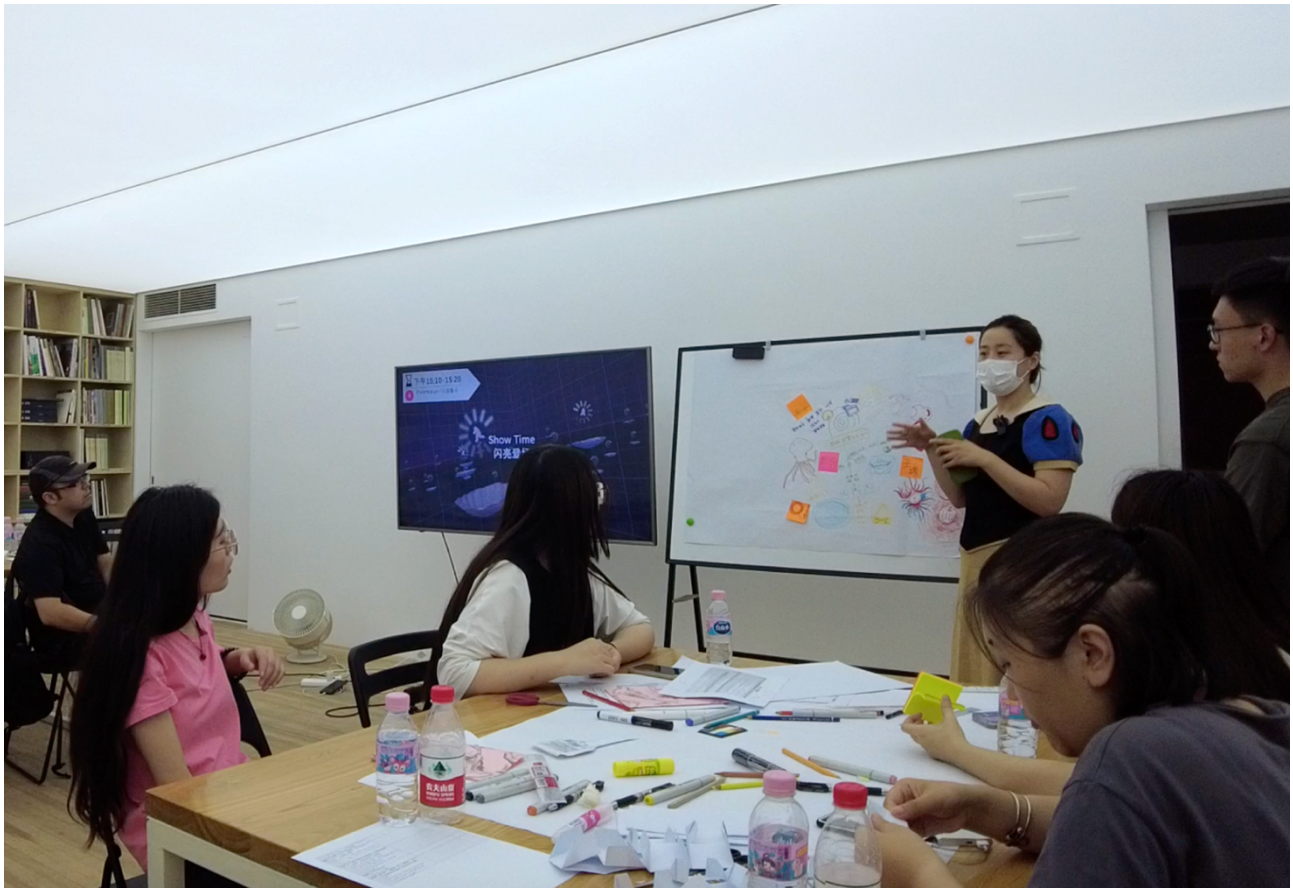

Fig. 18. The photo shows participants presenting and explaining their LFPs in the Beijing workshop. The photo was taken by You Jiadi for research purposes.

Interacte with the Researcher's/Artsist's Props:

During the LFPs creation process, the researcher also provided participants with the prototype's program files, as shown in Fig. 19. This allowed them to interact with them to understand the underlying technological principles, gaining a deeper material understanding of the relationship between video game technology and the application of techno-feminist principles. The segment of interacting with the researcher/artist's props sparked significant interest, inspiring participants to look forward to learning more about technology and exploring expressive possibilities, with some even attempting to modify the researcher's program functions.

Fig. 19. The photo shows participants interacting with the artist's prototype program files during the Beijing workshop.The photo was taken by You Jiadi for research purposes.

Group Discussions:

The group discussions followed the question outline used in the Nanjing workshop. Participants were divided into pairs freely in the first discussion session, while the second discussion was conducted by groups working together on the LFPs, as shown in Fig. 20. Participants were free to choose their preferred locations within the art institution's space for both discussions and audio recordings were made. The researcher did not participate in the discussions but set up a Q&A session after each discussion for feedback exchange. Participants showed high engagement in this segment, with some even taking severe notes and drafts in preparation for their answers. From the recorded data, participants' discussions followed the outline closely, exploring and reflecting deeply on each question.

Fig. 20. The composite photo of the Beijing workshops illustrates two aspects: (left) participants divided into pairs during the first group discussion and (right) the second group discussion, with groups working together on LFPs. The photos were taken by You Jiadi for research purposes.

The Performative Survey Questionarie:

The Beijing workshop used the same questionnaire as in Nanjing, with an average completion time of 12 minutes, consistent with the anticipated duration.

Souvenirs and Selfie Props: The tote bages and selfie props were highly appreciated by participants.

5.3.4.2 Preliminary Observations of Beijing Workshops

The Beijing workshops were more comprehensive, and enriching compared to previous ones, yielding substantial research data and proving to be a valuable experience for both participants and the researcher. Key observations and impressions include:

First, the Beijing workshop predominantly attracted the core demographic this research aims to engage, poised to apply creative technologies in their future academic and professional endeavours, which not only fulfils the research's foundational goals but also ensures that participants derive meaningful insights from their workshop involvement, thus enhancing the overall value of the workshop experience.

Second, some Beijing participants demonstrated a limited understanding of techno-feminism, as seen through numerous questions during lectures and difficulties encountered in group discussions. The lack of familiarity can be attributed to the limited exposure among the participants, with techno-feminism still being an emerging concept in China's academic and practical fields.

Third, the prototype experience, integrated within an exhibition closely tied to the workshop's thematic exploration, captivated participants as in previous workshops. The majority managed to navigate and delve into the prototype independently, which may be because of their academic backgrounds linked to creative technologies. Also, the immersive GameArt experience, such as the engaging setup of the lecture and exhibition in the workshop, enhances the participants' engagement with the study's themes. Some participants reported the dizziness caused by VR.

Fourth, the LFP creation segment showcased remarkable engagement and outcomes. Stemming from reflections on the London workshop, this segment enabled participants to explore applying techno-feminist principles to creative practice. The variety and richness of participants' creations showcased and enriched the application of techno-feminist principles in GameArt practice.

Fifth, the exhibition reimagined the gallery as an interactive GameArt space, closely intertwining exhibited works with the prototype to weave a narrative between the virtual and the tangible. The exhibition deepened the understanding of the workshop's themes, offering an immersive exploration of the prototype. This strategic presentation, rooted in prior workshop reflections, underscored GameArt's role in contextualising research within tangible experiences, enhancing participants' comprehension and the applicability of findings.

Sixth, introducing role-playing and selfie props, as shown in Fig. 21, emerged as a novel approach in the Beijing workshop. The art institution is transformed into a performative GameArt fostered a direct engagement, where installations and props invited participants to merge their experiences with the exhibition's narrative. This initiative bridged the prototype's themes with real-world

reflections and invigorated participant interaction, amplifying the workshop's immersive and reflective dimensions.

Fig. 21. The composite photo of the Beijing workshops shows participants role-playing and interacting with selfie props. The photos were taken by You Jiadi for research purposes.

5.3.4.3 Preliminary Evaluation and Reflections on Beijing Workshops

The Beijing workshop surpassed expectations. It not only formed a space that facilitates participants' discussions and examinations of traditional female roles and societal gender expectations in China but also allowed participants to explore applying techno-feminist principles to GameArt practice by making LFPs. Moreover, group discussions ignited profound and insightful debates on socially constructed stereotypes of gender roles in China, offering a wealth of data for research. Critical reflections on the Beijing workshop are as follows:

First, hosting the workshop within an art non-profit institution was crucial to its structure and effectiveness. Offering more than just the artistic environment found in galleries, non-profit art spaces provided distinct advantages, particularly in fostering educational and community involvement. This venue encouraged broader public interaction and a deeper understanding of the workshop's themes, laying a robust foundation for the project's success by offering ample hands-on practice and support opportunities.

Second, the immersive exhibition of research themes and the prototype, using interactive displays, seamlessly merged the real with the virtual, intertwining theory with tangible experience. This strategy enhanced participants' comprehension and reflection on the prototype's focus on gender stereotypes in China and connected reflection on the virtual experience to tangible world contexts.

Third, engaging participants directly in creating LFPs was a creative challenge. This activity requires participants to apply theoretical knowledge from lectures, exhibitions, and prototype experiences to explore adopting techno-feminist principles in GameArt practice. Thus, this reinforces their understanding of techno-feminist GameArt practice. Their LFPs show that this section promotes team collaboration and community building. Also, it facilitated the transfer of knowledge and encouraged critical thinking and innovation.

Fourth, the Beijing workshops' success relies on focusing on the research's target groups. This focus not only promoted engagement and satisfaction among participants but also made the workshop's outcomes more meaningful and impactful, forging strong bonds between the researcher and participants through mutual exploration and learning.

5.4 Approach to Sub-questions

5.4.1 Approach to Sub-question 1

The study initially investigates emerging practices in the hybrid area of video games and art, combining observations of current practices with the researcher's artistic endeavours in this hybrid zone. This step reveals that GameArt practices have developed characteristics that differ from previous practices of game art. However, a literature review indicates that there is still a gap between the widespread practical application of GameArt as a practice and the relative absence of rigorous academic scaffolding and terminology around the practice itself. Therefore, this study analyses and relocates GameArt practices through a new materialist lens and proposes new terms. Subsequently, the practical components involved in the study's artist-led techno-feminist

GameArt practice, such as prototype making and workshops, further demonstrate and examine the proposed terms and scope of GameArt practice from a practical perspective. Finally, workshop participants' creation of LFPs enriches the forms and content of techno-feminist GameArt practice in China. After a series of steps above, this study may infer that GameArt is a form of performative worlding activity.

5.4.2 Approach to Sub-question 2

To address Sub-question 2, this study identified a lack of application of techno-feminist theory in the art and gaming sectors through a literature review, noting the relative lag in developing practices at the intersection of video games and art. The application of techno-feminist principles in GameArt practices within this hybrid space is almost nonexistent. Additionally, a review of the current state of video games and the industry, coupled with in-depth interviews with professionals in both the gaming and art fields, suggests that the gaming industry may not currently offer a conducive environment for conducting GameArt practices that draw on techno-feminist principles. In contrast, the art sector appears to offer more possibilities. Subsequently, this study explores the potential advantages of conducting the GameArt practice in the art sector. Through these steps, the study infers that artist-led GameArt practices that draw on techno-feminist principles could be most effectively conducted in the art field in China. This inference guides the contextual setup of the research, particularly the decision to host workshops within art institutions in China. Ultimately, the successful conduct of the artist-led techno-feminist GameArt practice within an art context in China and the feedback collected from the workshop participants validate the efficacy of this inference for guiding the choice to conduct research practices in an art context in China.

5.4.3 Approach to Sub-question 3

To address Sub-question 3, the study first reviewed literature on immersive technology and gaming language related to cognition impacts and perception changes. These studies indicate that various elements in IVEs, such as avatars, agents, perspective settings, and voices, can influence the

experiencer's cognition and perceptions, providing theoretical support for specific design elements in the prototype. The study then reviewed mirror stage and Apparatus theories, analysing the potential of VR GameArt environments as "mirror apparatus." Next, the study examined elements and behaviours related to women stereotypes with social-cultural significance, integrating them into the prototype's design. Subsequently, feedback was collected from workshop participants who experienced the prototype to assess whether the design provoked reflection on gender stereotypes in China.

5.4.4 Approach to Sub-question 4

To answer Sub-question 4, this study initially explore artists using workshop as a practice to arouse social changes. This review provided valuable references for the conduct of workshops in this research. Then, the study facilitated an immersive context for techno-feminist GameArt practice by organising workshops and accompanying exhibitions in art institutions, inviting and engaging participants in workshop activities. Finally, group discussions and LFPs made by workshop participants were used to assess the potential of artist-led techno-feminist GameArt practice in China.

Chapter 6: Results

Chapter Introduction

The main research question unfolds through four lines of inquiry. Therefore, the result chapter presents the results centred around the answers to these four sub-questions through both theoretical inferences and practical discoveries. The theoretical results primarily refer to the findings from literature reviews, theoretical analysis, and case studies. The practical outcomes are mainly drawn from interviews with industry professionals, prototype development, and workshops (including group discussions, LFPs making, and the performative survey questionnaire). The result

chapter only presents a summarised overview of feedback from the workshops (for detailed discussion excerpts, see Appendix G).

6.1 Results for Sub-question 1

Sub-question 1: What is GameArt practice?

6.1.1 Theoretical Findings

GameArt practice is a form of performative worlding activity in which creators and participants, along with various materials, collaboratively engage in world-building and knowledge-making. It emerges in the hybrid field of video games and art, integrating video game technologies and fine art expressions to engage in virtual world-building. GameArt practice demonstrates a hybrid relationship between video games and art. GameArt practice can be considered an ongoing creative “practice of inquiry”, where “worlding” serves both as the goal and as the method through which GameArt practices achieve their objectives. Moreover, GameArt practice occurs within and is materialised through the GameArt Apparatus, a dynamic systemic environment. The worlds established in GameArt practice are generally speculative but can potentially become a new “reality” through the GameArt practice process. The role of creators in GameArt practice is similar to a “superposition state,” bearing moral responsibilities.

6.1.2 VR GameArt Prototype Application

(See the prototype Application in Annex A; see the prototype walkthrough video link in Appendix A: AA.2)

6.1.3 Summary of Group Discussions

(See excerpts from group discussions in Appendix G; summaries of each question for this section are provided below.)

In the workshops' group discussions, feedback related to sub-question 1 includes examining participants' attitudes and understanding of Game Art, assessing participants' perceptions of Game Art after experiencing the prototype in this study, and comparing the prototype experience with their previous game art experiences.

Summary of Feedback on Attitudes and Understanding of GameArt Practice

The findings show that most participants had not had similar experiences before and had a limited understanding of GameArt. Their experiences with the prototype in this study aligned with their expectations regarding VR immersion and anticipation for an artwork. The differences primarily emerged in comparison with previous gaming experiences. They perceived the prototype as more focused on artistic expression and exploring profound themes, necessitating self-exploration and interpretation from the experiencers. Formally, it was seen as more open and multi-layered, offering a rich visual experience and a strong sense of immersion. Some even stated that the prototype exceeded their expectations, particularly in its comprehensive use of video game language within artistic creation. Moreover, the prototype's feminised design, positioning, and visual effects were also positively acknowledged. Overall, the prototype left a profound impression on the participants, providing a novel, diverse, and profound experience. (see Appendix G: AG.1).

6.1.4 Summary of Performative Survey Questionnaires

The results from 70 samples from the Performative Survey Questionnaires show that over 75% of the respondents liked or very much liked the prototype. Among them, participants who attended the workshop showed a higher affinity towards the prototype (see Appendix I: AI.01). Regarding

the prototype's effectiveness in triggering reflection on women-related issues the majority of the 70 samples rated it 4 or 5, accounting for 64.3%. Among them, participants who attended the workshop showed a higher affinity towards the prototype (see Appendix I: AI.02).

6.2 Results for Sub-question 2

Sub-question 2: In which context could an artist-led GameArt practice informed by techno-feminist principles be effectively conducted in China?

6.2.1 Theoretical Findings

An artist-led GameArt practice informed by techno-feminist principles can effectively be conducted in the art field in China.

6.2.2 Interview Results with Professionals

(See the link to the interview videos in Appendix A: AA.1; see the video transcripts and text-based interviews in Annex B).

The results encompass three aspects:
Interviewees agree that directly conducting techno-feminist GameArt practice in China's gaming industry is challenging. However, they also express a general willingness to see attempts at feminist expression using game language, irrespective of the gaming field or any other field.

Interviews show that several factors contribute to the rarity of adoption of techno-feminist principles in video games, including but not limited to policies related to the gaming industry, the development of feminism in China, public negative attitudes towards feminism, the current state of the gaming industry, and the education system.

Gained valuable suggestions for prototype design and development.

6.2.3 Summary of Group Discussions

(See excerpts from group discussions in Appendix G; summaries of each question for this section are provided below.)

This section presents feeback from workshop's group discussions on various topics:

Summary of Feedback on Attitudes and Understanding of Techno-feminism in China:
Feedback shows that participants generally perceive Chinese feminism and women's rights as complex and more "implicit" compared to Western radical feminism, even considered a sensitive topic. Many believe Chinese feminism lacks localisation and practical application, leading to conceptual confusion and cultural disconnection. Compared to the West, the history of the feminist movement in China is relatively short, with a longstanding lack of female narratives and organisational and categorical structures. Currently, discussions about women's rights are often conducted through social media, where they tend to evolve into debates of male versus female opposition rather than true feminism. Participants generally had limited understanding of techno-feminism, with some perceiving it as women's participation and elevation in the tech field, while others associated it as a method to link artistic creation and multimedia, viewing it as a platform for forming new subjectivities in work and creation. Overall, feminism in China is characterised by complexity, with public perceptions varying widely and often being subject to controversy (see Appendix G: AG.2).

Summary of Feedback on the Value of Workshops in Art Institutions for Creating Spaces to discuss and examine traditional female roles and societal gender expectations:
Workshops in art institutions are seen as effective platforms for discussing feminism and women related issues, providing broader perspectives, introducing new ideas, and prompting personal and

collective reflections. Some discussants also emphasised the importance of the quality of GameArt works and organisation for successfully conducting such workshops (see Appendix G: AG.3).

Summary of Feedback on the Role of the Art Context in Facilitating GameArt practices:
Participants believe that art institutions can play a vital role in facilitating GameArt practices to formulate a spaces for women to discuss and examine traditional female roles and societal gender expectations in China. Because art institutions not only attract the right audience and expand viewership but also increase acceptance and foster deep thinking due to the distance and ritualistic aspect of art. Moreover, some highlighted the ceremonial aspect of workshops in art institutions and their impact on trust, encouraging participation in discussions. Overall, participants generally see the art context positively influencing GameArt practices and establishing spaces for discourse (see Appendix G: AG.4).

Summary of Feedback on the Workshop's Supporting Exhibition:
Feedback shows that the workshop's accompanying exhibition, employing VR experiences, installations, and related research documents, provided a multi-faceted and in-depth understanding of GameArt practice and this study. The exhibition, closely themed on the main research question and immersive, presented the elements and topics of the prototype in both virtual and real worlds, allowing attendees to deeply understand the theme visually and emotionally (see Appendix G: AG.5).

6.2.4 Summary of Performative Survey Questionnaires

About 96% of the 27 participants in the Nanjing and Beijing workshops (7 "yes," 19 "definitely yes") felt that workshops in an art context provided a space for free discussion of women's issues (see Appendix I: AI.22). Approximately 85% believed art institutions played a significant role in providing such spaces (13 "significant role," 10 "very significant role") (see Appendix I: AI.23).

6.3 Results for Sub-question 3:

Sub-question 3: Can this study's VR GameArt prototype, employing a female-focused narrative and the "mirror apparatus" as design strategies, facilitate reflection among participants on gender stereotypes in China?

Results Overview:

Participants generally think the prototype could provoke reflections on gender stereotypes and societal gender expectations in China, influencing their perceptions of Chinese women's traditional roles to varying degrees.

6.3.1 Theoretical Speculations

The VR GameArt prototype, a multidisciplinary medium that combines elements from various fields, can significantly impact participants' perceptions through immersive multisensory experiences, interactive gameplay, narrative, and visual aesthetics. This study employs the VR GameArt prototype with design strategies focused on women's narratives and the "mirror apparatus", which could effectively provoke participants to reflect on gender stereotypes in China.

6.3.2 VR Game Art Prototype Application

(see Annex A for Prototype Application)

6.3.3 Summary of Group Discussions

(See excerpts from group discussions in Appendix G; summaries of each question for this section are provided below.)

6.3.3.1 Summary of Feedback on Designs Related to Female-focused Narrative.

Feedback on prototype's design focusing on women's narratives encompassed discussions from seven aspects: background story, ultimate goal, scenes and tasks, situated narrative, illusions of owning agency, "mimesis," and numerous female NPCs.

6A.1) Feedback on Background Story and Ultimate Goal

This feedback assesses participants' perceptions of the story they think they experienced and elements in the prototype that led them to contemplate women's issues deeply. Most participants said they felt like experiencing a story about women's constraints and social conditioning, which led them to reflect on stereotypes and group pressures presented in the prototype and discuss how to break these limits. (see Appendix G: AG.6).

6A.2) Feedback on Scenes and Tasks

Feedback indicates that the "clock-in" and selfie tasks were the most engaging sections, capturing significant interest and attention as they reflected expected female behaviour in contemporary society. Participants noted that these tasks enhanced the prototype's appeal, sparking their reflections on selfie behaviours as a social phenomenon relevant to many Chinese women. Moreover, participants also indicated that these tasks encouraged them to reflect further on the relationship between herd mentality, consumer psychology, and selfie behaviours (see Appendix G: AG.7).

6A.3) Feedback on Situated Narrative

Designs related to Situated Narrative include three nested timelines and non-linear storytelling, multiple paths, the unreliable narrator, and specific mirror stages. Feedback from group discussions shows that three situated narratives and non-linear storytelling prompt participants to seek narrative connections within the jumping scenes and voyage. Some participants drew parallels of this design with the concepts of id and superego, while others associated the design with a non-binary and fluid gender perspectives. Feedback on the multiple story paths shows that participants were aware of the prototype's openness and realized the need to actively explore to experience different outcomes. Some participants also drew parallels between the choices within

the paths and the choices made in their own lives. Regarding the unreliable narrator, some participants believed it offered an alternative worldview, while others expressed that it induced a sense of contradiction. Participants thought the first and third specific mirror stages strongly impacted them (see 6B.3 below). (see Appendix G: AG.8).

6A.4) Feedback on the Illusion of Owning Agency

The illusion of owning agency was examined through participants' feedback on decision-making at critical points, particularly when responding to comments from the "Other" in scene01 and during the selfie task. Feedback indicates strong resonance with this theme. Participants described internal and external conflicts when deciding whether to accept the crowd NPCs' comments on them, with these comments related to female stereotypes. Some linked these feelings to emotions of powerlessness against systemic settings in real life. Moreover, this illusion of owning agency was mentioned during the discussion of the selfie task, where some participants felt they lost their agency due to herd behaviour (see Appendix G: AG.9; also refer to Appendix G: AG.15 and AG.16).

6A.5) Feedback on "Mimesis"

"Mimesis" in the prototype is manifested in the immersive techno-pink space, the feather as a weapon, and exaggerated symbols associated with women.

6A.5.1) Feedback on Techno-pink

Feedback indicates that the immersive techno-pink space sparked intense discussion and reflection among participants. Many participants liked the pink colour used in the prototype and exhibition and were immediately aware of the association between pink and women. They noted that while pink might perpetuate female stereotypes, its use in the prototype and exhibition had a strong visual impact, being thematically fitting and ironically practical, aligning well with the expression of combining technology and femininity. Some participants initially resisted the colour pink, but after engaging in discussions, the majority came to view it as a satirical tool against gender stereotypes, symbolising both bravery and gentleness as facets of femininity. Moreover, some indicated that the intensive use of pink, without complementary colours, paradoxically

highlighted elements beyond the colour itself. Some participants mentioned that the immersive pink experience, beyond what they encounter in everyday life, pushed them to step out of their comfort zones (see Appendix G: AG.10).

6A.5.2) Feedback on Exaggerated Symbols Associated with Women.

Some participants thought symbols associated with femininity, such as furry textures, caught their attention and gained their fondness. Some felt these furry textures were visually pleasant, and hairy bodies created a conflict with cyber metallic plants, generating a feeling combining softness and coldness. Some associated these hairy entities with an abstract sense of “self.” A few participants had different opinions regarding these exaggerated elements, leading to a discussion on the symbolic nature of these exaggerated feminine objects and the metaphor meaning of their placement in the Temple (see Appendix G: AG.11).

6A.5.3) Feedback on the Feather Weapon

Participants thought that employing the feather as a weapon to break glass cabinets creates deep impressions, generating intense interest and strong resonance. They think it is an astonishing design, vividly demonstrating the potential strength in seemingly weak entities or groups. Their feeling and reflections stemmed from their direct participation in breaking glass cabinets with feathers in the prototype, triggering genuine empathy. The design of the feather weapon sparked broad discussions; some saw it as representing unique female strength and resilience, while others linked it to the philosophy of overcoming hardness with softness, suggesting that breaking gender stereotypes and constraints in women’s lives can be achieved in different, even effortless approaches, sometimes needing just a momentary shift in perspective. Others explored the potential of creating counterintuitive effects in game design and the absurdity it brings; some felt empowered and courageous through this action (see Appendix G: AG.13).

6A.5.4) Feedback on Ironic Code of Conduct

Participants’ responses to the ironic Code of Conduct are varied. Some people agree with this form of irony, believing it aligns with their approach when facing similar issues. Others emphasised the irritation caused by the continuous indoctrination of audio, even inspiring a counterplay attitude.

There also are participants who reported not hearing or paying attention to it. The ironic content led to varying degrees of reflection and emotional response (see Appendix G: AG.12).

6A.6) Feedback on Numerous Female NPCs

Another female-focused narrative design is employing numerous Female NPCs in the prototype, including their appearance and behaviours, and positioning them as "Others" (for further details see 6B.1). Participants believed the digital world could more extremely and exaggeratedly represent feminine traits. Some admitted that they were influenced because they were drawn to the female NPCs' beauty; others related the NPCs' superficially attractive but emotionally hollow personas to societal phenomena; some affirmed the thematic effectiveness and fittingness of the female NPCs' design elements, like voxelisation (see Appendix G: AG.14).

6.3.3.2 Summary of Feedback on the "Mirrors Apparatus"

The prototype's IVE is designed as a "mirror apparatus" to influence participants' perceptions through various "reflective" elements. Participants' responses to elements like the "Other," the "Big Other," avatars, and the specific mirror stage design are collected to evaluate the impact on participants' reflections on gender stereotypes in China. Overall, participants showed deeper thinking about female self-perceptions. They related these reflections to real-life scenarios. Key details are as follows:

6B.1) Feedback on the "Other"

The "Other" mainly refers to the prototype's crowd NPCs and the Forsaken NPC. Evaluating participant feedback on these agents determined if their reflections as "Other" influenced thoughts on gender stereotypes. The feedback collected about crowd NPCs as "Other" mainly from the "choosing comment" moment in Scene01[99] and the selfie task, while The Forsaken was examined separately.

[99] The "choosing comment" moment in the Scene01: Assembly Lab/ Outlying Island scene occurs when the participant selects their language in the prototype's main menu. Here, they must decide whether to accept or reject comments from others, influencing the platform's movement and progressing to the next scene.

6B.1.1) Feedback on the Crowd NPCs as “Others” in Scene01

Feedback shows that the “choosing comment” moment in scene01 profoundly provoked participants by experiencing crowd NPCs’ “gaze” and interacting with their comments, leading to internal struggles and reflections. This impact on participants was achieved through echoing personal experiences in real society and magnified by “forced” choices against their will. Many expressed that they felt genuine enlightenment, delving into the societal moulding of women, herd mentality, and the male gaze. They also contemplated the internal conflicts during personal identity construction. This process involved understanding the influence of the “Other” and exploring the relationships between self and role-playing. Moreover, some particularly compared the decision-making process in the prototype with real life, emphasising the high cost of making similar choices in reality. Ultimately, participants extended their thoughts to resisting and constructing their own real-life rules (see Appendix G: AG.15).

6B.1.2) Feedback on the Crowd NPCs as “Others” in Scene02

The selfie task gained numerous participants’ attention (see 6A.2 and Appendix G: AG.7). Feedback related to crowd NPCs as “Others” during the selfie task shows that participants’ reflections on this design are mainly related to real-life herd behaviour. Moreover, some participants described adopting the NPC’s perspective during the selfie interaction, offering a different view of themselves (see Appendix G: AG.16).

6B.1.3) Feedback on the Forsaken NPC as “Other”

Due to the Forsaken NPC’s peripheral location in Scene02, few participants encountered it. Those who encountered it reported that questions the Forsaken NPC asked guided them to reflect on their identity. The Forsaken NPC gained more attention in Scene06, where it uses a feather weapon to break glass containers and release Xiao Mei (participant’s avatar); however, participants paid more attention to its actions, breaking the container with the feather weapon and did not mention any further thoughts about the Forsaken NPC itself. Moreover, some noted its gender-neutral appearance (see Appendix G: AG.17).

6B.2) Feedback on the “Big Other”

The “Big Other” in the prototype is represented through various aspects such as the tasks, gameplay, rules, and the symbolic representation of authority like NR1, which embodies the system value and is embedded in the participants’ whole prototype experience.

6B.2.1) Feedback on the System ‘s Value and its associated Gameplay and Tasks as the “Big Other”

Participants strongly felt the influence of the “Big Other” in their experience related to the in-prototype value system related to gameplay, tasks, and rules, which is reflected in their overall perception of experiencing the prototype. Feedback shows that most participants felt they were navigating a narrative about societal and external impositions of stereotypes and expectations of women. They thought the impact was also associated with interactive details, for example, the platform descending when a “wrong” choice was made, darkening the scene as a form of “punishment,” and instilling panic and a sense of oppression. These experiences led to their deep reflections on real-world issues of female self-perceptions and breaking free from societal constraints, leading to discussions on how women might autonomously define their identities (see Appendix G: AG.18).

6B.2.2) Feedback on the NR1 as the “Big Other”

Participants had complex reactions to the NR1 as the “Big Other.” Some reflect on habitual compliance. Some participants perceived the repetitive voice as an incantation. Some associated it with the undertone of social conditioning. The NR1’s non-stop talking exerts immense pressure and even triggers them to want to escape or counterplay. Others noted the dual role of the NR1 as both guidance and intrusion, leading to ironic (see 6A.5.4) and conflicting experiences. Meanwhile, some participants focused more on interaction with the surrounding environment, paying less attention to the NR1 or not clearly hearing what it said. The discussions and thoughts provoked by the NR1 as the “Big Other” primarily involved considerations of societal conditioning on individuals and subconscious adherence to systemic values, with some mentioning it spurred their reflections on human-technology relationships (see Appendix G: AG.19).

6B.3) Feedback on the Specific Mirror Stages

The first and third specific mirror stages - filtered selfies (see 6A.2 and 6B.1.2) and the virtual mirror – obtained significant attention and sparked heated discussions. Some participants emphasised the effectiveness of these designs in expressing the prototype's theme in challenging gender stereotypes in China. Some detailed and compared the psychological contrasts experienced when seeing different "selves" in these stages, attempting to interpret the associations between these different images of avatars. Others mentioned the impact and shock they experienced when seeing their own image (avatar) through selfies in a VR because they could not see their body from the 1PP. Feedback related to "reflections" shows that participants thought these two mirror stages displayed multiple facets of self-image, blurring lines between virtual and real identities. Some viewed selfies as an objectification of self-image, while reflections from the virtual mirror were seen as a more authentic self. Others reported that the "image of an image" in the virtual world increased the distance between self and reality. Some highlighted the "faceless contours" (refers to the Backstage avatar) in the virtual mirror, reflecting discrepancies between self-perception and others' views on them, implying inconsistencies in real-life self-perception. Overall, discussions and reflections on these two specific mirror stages primarily focused on avatar-self relationships, selfies and its relation to real-life self-identity construction, the fissure behind the default sameness between self and avatar(the potential multiplicity of possibilities of the agency), as well as analysing the effectiveness of the artist's design on the expression of the work. (see Appendix G: AG.20).

The second specific mirror stage, the Forsaken NPC, was less encountered due to its more hidden placement for design purpose, resulting in fewer comments (also see 6B.1.3 and see Appendix G: AG.17).

The fourth specific mirror stage in the prototype, perspective changes in out-of-body experiences, left a profound impression on some participants. Some associated it with the diversity and fluidity of identity, discussed avatars' role in blurring bodily boundaries and emphasised a multi-layered understanding of self-perceptions. Others enjoyed this experience but found it indescribable (see Appendix G: AG.21).

6.3.3.3 Summary of Feedback on Using VR

Participants acknowledged that VR's intense immersive experience enhanced their engagement with the work. However, they also mentioned occasional discomfort or dizziness associated with VR technology. Some expressed hope for future VR technical improvements (see Appendix G: AG.22).

6.3.4 Summary of Performative Survey Questionnaires

Among 60 answers, participants identified the prototype as most effective in prompting profound reflection on cultural and traditional values (about 60%), followed by self-perception (26.7%) and societal structures and power systems (21.7%) (see Appendix I: AI.03).

In 48 responses, elements most effective in evoking thoughts on women's issues are the main task of becoming "perfect," avatars visible only in specific ways, and exaggerated female accessories like giant handbags and high heels (see Appendix I: AI.04). About 56% of participants were motivated by the prototype to adopt counterplay attitudes(see Appendix I: AI.09), with the top three elements being first-person perspective, visual aesthetic, and the value system of the world depicted in the work and the prototype's humorous and ironic expressing style(see Appendix I: AI.10). About 63% of participants expressed that they understand how to use GameArt to explore women's issues through experiencing the prototype(see Appendix I: AI.11), with over 56% seeing think there is a significant potential for this techno-feminist GameArt practice in China(see Appendix I: AI.13).

Among the 70 responses, over half indicated that they could relate the experience gained from the prototype to real life (see Appendix I: AI.05). Furthermore, 74% of respondents expressed interest in exploring other similar works (see Appendix I: AI.12), 73% would create GameArt if unrestricted (see Appendix I: AI.14), and 74% would recommend the prototype to others (see Appendix I: AI.15).

Overall, participants who attended workshops generally scored higher across all areas.

6.4 Results for Sub-question 4

Sub-question 4: What is the potential of an artist-led GameArt practice informed by techno-feminist principles in China?

6.4.1 LFPs Created by Workshop Participants

(See Appendix H for more details of LFPs made by workshop participants; see Appendix A: AA.3 for Audio recordings when participants present LFPs).

Five groups participated in creating LFPs in the workshops. The outcomes demonstrate participants' understanding and application of techno-feminit principles to GameArt practices to create content and forms that explore various gender-related issues in China.

Group 01's LFP, as shown in Fig. 22, focused on the use of symbolism and visual language in its design. The medium they plan to use is VR. They employed black and white cocoon elements to represent women striving for freedom and independence. These black and white cocoons are drawn and placed separately on a small piece of paper outside a large and colourful paper that symbolises society. They indicated that this placement suggests these women's alienation from societal labels. The cocoon's thick walls also imply the fact that these black and white women must adopt society's colourful labels to integrate themselves into society. However, in the area representing society, Group 01 also painted many hollow cocoons, symbolising women after they have integrated into society, hinting at their emptiness following assimilation. Group 01's LFP aims to invite participants in VR to interact with a virtual "societal chessboard" and explore a space for cocooned women existing outside standard societal norms.

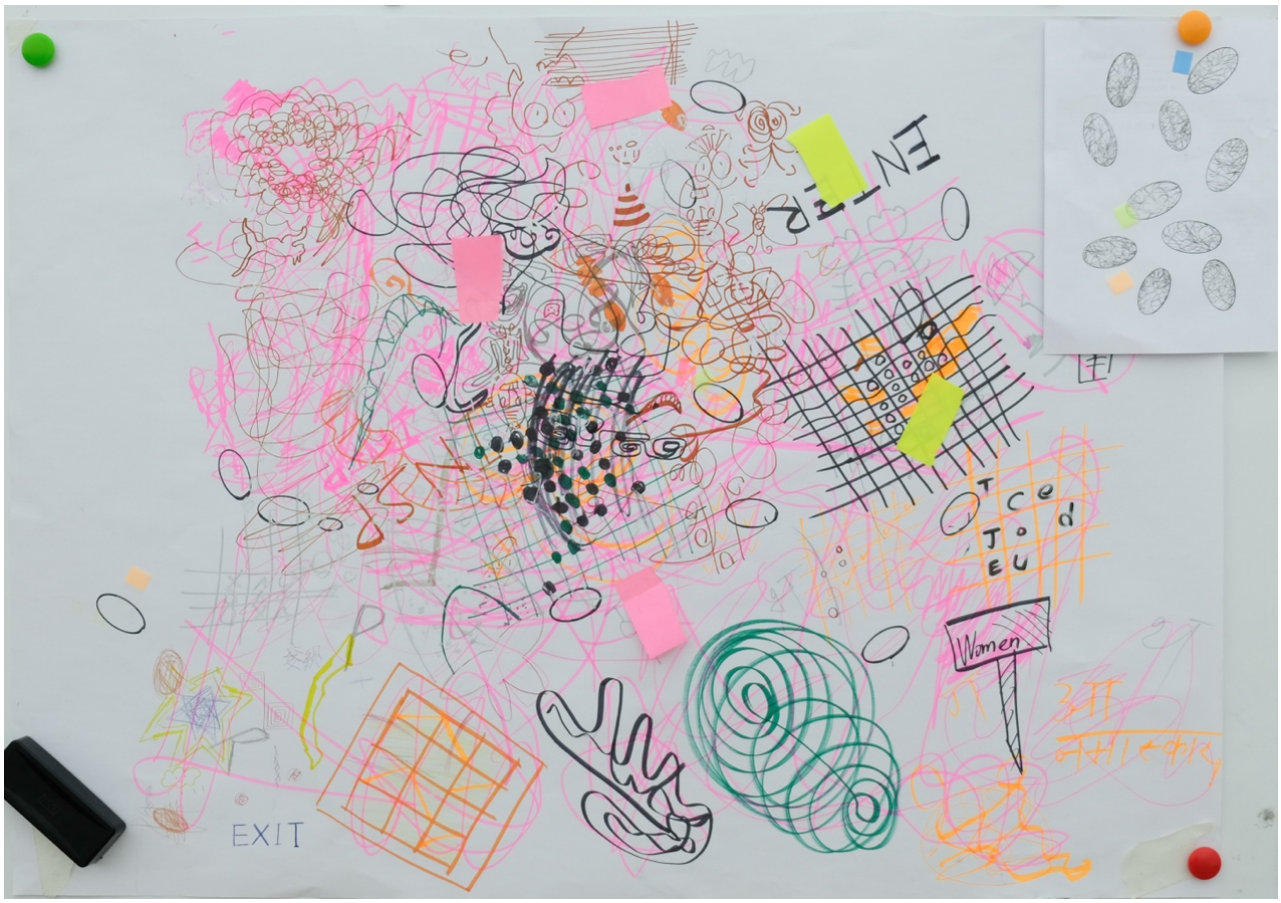

Fig. 22. The photo shows Group 01's LFPs in the Beijing workshop. The photo was taken by You Jiadi for research purposes.

Group 02's LFP, as shown in Fig. 23, emphasised the gameplay and mechanisms, centering on female's appearance anxiety in real society. Their LFP uses Vtuber-style live streaming to explore appearance anxiety. They plan to divide participants into audiences and streamers. The streamer group will be randomly assigned avatars of varying appearances; some avatars are attractive, while others are less attractive. However, the streamer will not be able to see what these random avatars look like. (Group 02 also designed an alternative where the avatar for a streamer is generated based on the actual appearance of the person playing the streamer.) Group 02 incorporated Vtuber interaction mechanisms into their design. In this setup, the streamer's task is to act as a virtual person with a pleasant personality, while the audience's task is to provide feedback on these virtual characters. This feedback will manifest through "live donations" from the audiences. The information from these donations will be relayed to the "live streaming platform," which then refreshes the appearance of the streamer's avatar every ten minutes based on the

popularity of the stream, causing the streamer's avatar to switch between attractive and unattractive looks. Group 02 also included other reward mechanisms, such as activating modes where the audience can comment and timely modify the avatar if the popularity in the live room is too high or too low. Overall, Group 02 has effectively used gameplay and tasks to create a scenario where individuals and groups strategise to explore issues related to women's appearance anxiety.

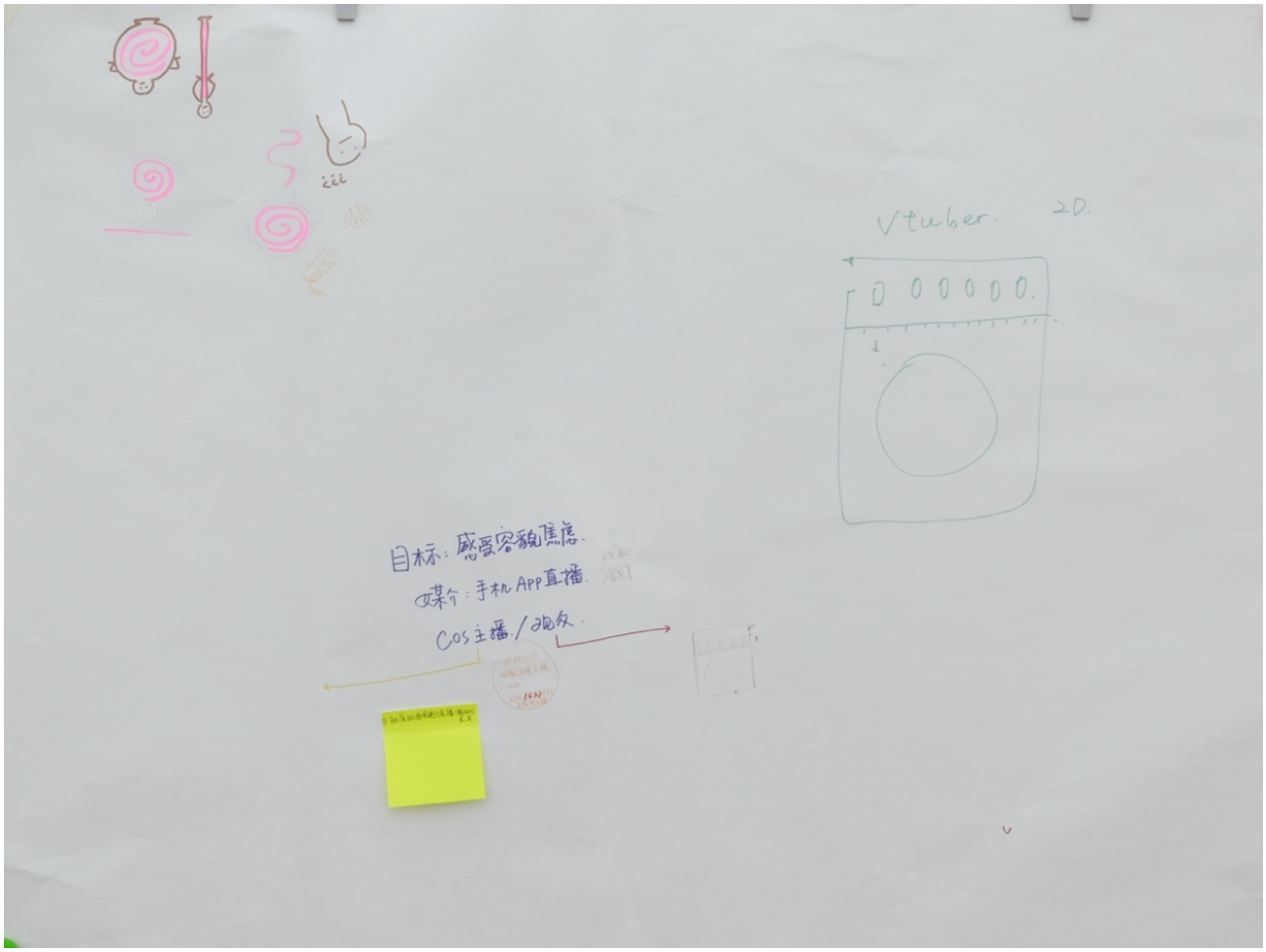

Fig. 23. The photo shows Group 02’s LFPs in the Beijing workshop. The photo was taken by You Jiadi for research purposes.

Group 03’s prototype, as shown in Fig. 24, focused on physical interaction and symbolic representation. They employed origami to convey issues surrounding women’s reproductive abilities. They focused on the influence of the societal group’s values on women and the reaction of women to the societal collective values. They aimed to depict the complexity of this universal

issue's fertility through the symbolic meanings of each origami fold. Each fold represents different choices and possibilities that can only be known once unfolded, symbolising life's uncertainties and possibilities. They highlighted the importance of accessibility and planned to make their project as simple as possible, allowing users to understand the concept with even just a piece of paper.

Fig. 24. The photo shows Group 03's LFPs in the Beijing workshop. The photo was taken by You Jiadi for research purposes.

Group 04's "Princess 3.0," as shown in Fig. 25. The Group 04 aimed to explore the social pressures and gender stereotypes women face through a role-playing text and Q&A GameArt experience. The main character is Snow White. The LFP designed three different eras, each depicting the specific problems and challenges Snow White encounters. The team particularly emphasised challenging society's expectations of "slim beauty" to encourage every woman to bravely realise and accept herself and her body. Also, they planned to introduce a gender-neutral AI that avoids a prince character's saving role in traditional narratives, emphasising women's self-liberation. They wanted their LFP to provide a platform for exploring gender roles and encouraging personal empowerment beyond societal expectations.

Fig. 25. The photo shows Group 05’s LFPs in the Beijing workshop. The photo was taken by You Jiadi for research purposes.

Group 05’s prototype, as they highlighted, is a “gender-neutral GameArt design,” as shown in Fig. 26. The LFP highlights Group 05's utilisation of VR technology and features, while also incorporating strong elements of video game interactivity. It explores bodily experiences and identity in immersive virtual spaces. In the LFP, participants can obtain body parts with unique functions through limb exchange. These specialised functional limbs not only change the physical characteristics of the participants’ avatars but also serve as a means to access different scenes and game levels. For instance, when participants continuously do specific tasks, their avatar’s arm will magically elongate, allowing the participant to reach distant places or targets in the environment with the long arm, triggering specific events. Additionally, Group 05 planned to incorporate economic incentives for limb replacement to enhance narrative depth and interactivity. They aimed to promote strategic interaction and self-exploration by transcending traditional human body limitations through innovative game mechanics and VR technology.

Fig. 26. The photo shows Group 05's LFPs in the Beijing workshop. The photo was taken by You Jiadi for research purposes.

6.4.2 Summary of Group Discussions

(See excerpts from group discussions in Appendix G; summaries of each question for this section are provided below.)

Feedback related to the potential of an artist-led techno-feminist GameArt practice in China was examined through three aspects: Participants' understanding of techno-feminist GameArt practice before and after the workshop, the advantages and challenges of GameArt practice in China, and discussions related to community-building.

6.4.2.1 Changes in Understanding Techno-feminist GameArt Practice Before and After the Workshop

Participants experienced a shift in their understanding of techno-feminist GameArt practice, moving from unfamiliar with the concept of techno-feminism or GameArt practice to recognising techno-feminist GameArt practice as a novel integration of techno-feminist principle to GameArt practice. They acknowledged its role in facilitating them to reconsider their perceptions of socially constructed gender roles. Some expressed heightened expectations, recognising the importance of women's agency in practice. Some indicate that they realised that GameArt practice was seen not just as an approach to feature women as main characters in video games but as a practice for reflecting on female roles and societal norms through technological involvement. Others were inspired to adopt technology to build new worlds, calling for more diversity and women's participation in tech sector. Discussions also extended to practical methods of promoting or conducting techno-feminist creative practice, such as utilising emerging technologies like VR to appeal to younger audiences, breaking gender biases through action, and stressing the importance of broader participation. (see Appendix G: AG.23).

6.4.2.2 Feedback on Advantages and Challenges of Techno-feminist Approach GameArt Practice in China

Most participants thought there was great potential in techno-feminist GameArt practice in China. Some participants highlighted the unique traits and advantages of game language in attracting the general public, suggesting that GameArt, with this component, could broaden the audience base. This expansion has the potential to attract more Chinese women, particularly from younger generations, thereby increasing participation in techno-feminist GameArt practices. Some believed the diverse expression and wide media malleability of GameArt practice were seen as offering new ways for women to convey their perspectives. Some highlighted the subversive potential of GameArt practice in popularising feminism, enabling self-exploration, and challenging conventional interactions. Meanwhile, challenges noted included the technical barriers of GameArt practice, VR limitations, traditional norms, ethical constraints, mainstream acceptance, and interpretation issues surrounding techno-feminism. Overall, participants saw GameArt practice as promising, expecting its potential to grow with technological advancements, increased female involvement, and better

understanding. They viewed the concept of techno-feminist GameArt practice as a seed planted in their minds, inspiring them to think and challenge existing societal norms. (see Appendix G: AG.24).

6.4.2.3 Feedback on Community-Building

The sense of community is assessed through discussions on workshop elements that fostered community, the most valuable outcomes they gained from the workshop, and ideas for promoting women's creative technology practices and community building. Feedback indicates that participants gained a strong sense of community in the workshop and acknowledged the positive impact and value brought by the workshops and the artist.

Activities that Make Participants Felt a Sense of Community during the Workshop:
Participants generally felt that group discussions and creating LFPs most effectively fostered a sense of community. They highlighted the importance of communication, shared activities and goals, and even debates in building this sense. Participants also reported gaining new insights and perspectives, deepening their understanding of themselves and women's values, and bringing new inspirations and thoughts to their daily lives. Moreover, some emphasised the need for a private and trustworthy environment for discussing and exploring meaningful topics and the workshop's role in building trust in terms of community-building. (see Appendix G: AG.25).

Feedback on Most Valuable Takeaways from the Workshop:
Participants' feedback on the workshop's benefits was overwhelmingly positive. They appreciated the process and experienced more than the final products. Some highlighted a deeper understanding of techno-feminism and GameArt practice, particularly through creating LFPs and engaging in group discussions, which enhanced their knowledge of applying techno-feminist principles in GameArt practice. Participants expressed pride in the artworks collaboratively created during the workshop. Moreover, they valued the workshop not only for providing a space to explore feminism and GameArt practice but also for the spiritual fulfilment derived from the process, which offered them varied perspectives on feminism and self-awareness, enhancing their understanding of themselves. They recognised the use of GameArt as a medium for spiritual inspiration and

reflection, viewing their experience in the workshop as a seed that will influence their future thinking and creativity. (See Appendix G: AG.26).

Ideas for Promoting Women's Creative Technology Practices and Community Building:
Participants proposed various ideas for promoting women's creative technology practice and community development. Some emphasised the crucial role of artists and workshops in spreading and advancing techno-feminist practice, hoping for guidance from experienced female creators and technicians in the hybrid area of art and tech and being role models to provide guidance and courage. Others suggested developing a feminist art theory system integrated with Chinese cultural characteristics to support the theoretical basis of creative practice. Also, there were calls for societal efforts to raise public awareness of the importance of techno-feminism, advocating for more opportunities and growth spaces for women in the tech field. Moreover, lowering the technological threshold was essential to encouraging broader participation in creative tech practices. Some focused on empowering women from the internal side, advocating for building self-confidence first and then influencing workplaces and society through action to promote gender equality. (see Appendix G: AG.27).

6.4.3 Summary of Performative Survey Questionnaires

In 27 responses, the most popular workshop activities are experiencing the prototype, the workshop's theme, and interacting with the artist, followed by team collaboration and group discussions (see Appendix I: AI.17). Approximately 89% reported increased interest and understanding of GameArt and techno-feminist practice after attending the workshop(see Appendix I: AI.19). About 93% believed the workshops helped attract women to the creative tech field and facilitate community-building (see Appendix I: AI.24 and AI.25). Approximately 88% were willing to maintain contact with other participants(see Appendix I: AI.26).

Chapter 7: Discussion

Chapter Introduction

This study employs an artist-led GameArt practice guided by techno-feminist principles to examine and challenge gender stereotypes in China critically. The central question explores how such a practice can provoke women participants to reconsider these stereotypes in China. Through four lines of inquiry, the research establishes a clear understanding of what constitutes GameArt practice and reveals GameArt practice's role as a platform for critical reflection and engagement. Initial exploration confirms the suitability of the art field over the gaming industry for hosting the practice in China, highlighting the influence of environmental factors on their effectiveness. Further examination of the VR GameArt prototype, designed with female-focused narratives and "mirror apparatus," shows its effectiveness in prompting more profound participant reflections on gender roles. Finally, the study assesses the broader applicability and impact of the techno-feminist GameArt practices in China. These findings answer the main research question from different perspectives. Therefore, the discussion chapter will address the results of these sub-questions in detail, providing a comprehensive response to the main research question.

7.1 Discussion of Sub-question 1

7.1.1 Overview

Sub-question 1: What is GameArt practice? Its answers stem mainly from theoretical findings, prototype creation, workshop activities such as group discussions, and participants' creation of LFPs. The outcome is that GameArt practice is a form of performative worlding activity in which creators, participants, and various materials collaboratively engage in world-building and knowledge-making. Exploration of the first sub-question establishes a clear understanding of what constitutes GameArt practice. This foundational insight underscores GameArt's capacity as a medium for critical engagement and reflection, setting the stage for its application in addressing gender stereotypes in the study.

7.1.2 Explanation and Analysis of Sub-question 1 Results

7.1.2.1 Theoretical Aspect

GameArt practice, as explored in this study, represents a compelling integration of video game technologies and fine art expressions, situated uniquely at the intersection of technology and art realms. This practice is fundamentally performative, relying on the collaborative efforts of creators and participants who engage with various materials to construct and navigate virtual worlds. Such an approach facilitates world-building and promotes the active generation and reconfiguration of knowledge, characterising GameArt as a creative practice of inquiry. In GameArt practice, worlding embodies a dual function as both the mechanism and the objective, pivotal for creating and understanding new realities. This approach allows practitioners to not only create virtual environments but also to actively engage with and reshape these spaces, thus challenging existing perceptions and norms. Through the dynamic process of building and interacting within these worlds, GameArt practice explores and expands the boundaries of artistic and technological realms, enabling a deeper understanding and reimagining of realities. This dual aspect of world-building as both the aim and the method enriches the practice's potential to influence cultural and gender narratives profoundly.

Within the framework of GameArt practice, the concept of the GameArt Apparatus is pivotal. This Apparatus is not merely a backdrop but a vital, systemic environment that encapsulates the physical, conceptual, and virtual elements involved in the creative practice of the inquiry process. It highlights how every aspect of GameArt practice—ranging from the technology and methods used to the creators' personal identities and cultural contexts—contributes to how knowledge is shaped and understood. This dynamic system reflects Donna Haraway's concept of situated knowledge by highlighting that understanding and interpretations in GameArt practice are deeply embedded in specific cultural, material, and interpersonal contexts. Therefore, GameArt practice is not just a creation of art. It facilitates the materialisation of worlds that, while initially speculative, have the potential to manifest as new realities through the practice of GameArt. Moreover, the role of creators within GameArt practice is notably complex and akin to a "superposition state." This suggests that creators possess multiple potential identities and responsibilities simultaneously,

reflecting the quantum theory concept where particles exist in multiple states at once until observed. In GameArt practice, creators oscillate between being artists, technologists, facilitators, and participants, each role imbued with its ethical and moral dimensions. This multiplicity is crucial for the ethical consideration of how virtual worlds impact real-world perceptions and interactions.

By relocating the GameArt practice, this study examines the potential of GameArt practices to shift perceptions and encourage critical engagement with socio-cultural issues, including gender stereotypes. GameArt emerges as a continual creative practice of inquiry, where the creation and exploration of virtual worlds are not only artistic endeavours but also methods for perpetually redefining reality and expanding epistemological boundaries.

7.1.2.2 Discussion of the Prototype

Establishing the prototype provided practical case references and creative methods for integrating techno-feminist principles into GameArt to facilitate women participants' reflection on gender stereotypes in China. Its focus on women's narratives enriches female expression in creative technology in China, while the "mirror apparatus" design offers new insights into the interplay between women participants and video game technologies. Additionally, the prototype served as an interface for workshop participants to engage with the researcher's practice, creating a space for dialogues. It also serves as a solid GameArt example, providing references and methods for participants to explore their LFPs.

7.1.2.3 Discussion of Participants' Feedback from Group Discussions

The feedback from the workshop group discussions provides crucial insights into the participants' perceptions and understanding of GameArt as a practice. The findings suggest that the prototype presented in the workshops was many participants' first in-depth engagement with GameArt, which significantly shaped their understanding and appreciation of this medium. Unlike traditional video games, the prototype was recognised for its artistic expression and the exploration of profound themes, requiring participants to engage in self-exploration and interpretation. This shift from conventional gaming experiences to a more open, multi-layered artistic engagement highlights GameArt's unique position at the intersection of video games and art. The prototype's success in

exceeding participants' expectations by effectively incorporating video game language into an artistic framework illustrates GameArt's potential to offer enriching, immersive, and multifaceted experiences. Such responses underscore the transformative potential of GameArt to expand beyond entertainment, fostering deeper cultural and thematic engagement.

7.1.2.4 Discussion of Participants' LFPs (also see 7.5.2.2)

LFPs created by participants attempted to challenge and deconstruct traditional roles and societal expectations of Chinese women using various creative technological methods, encouraging female self-awareness and expression. These LFPs reflect participants' understanding and engagement in adopting techno-feminist principles into GameArt practice, revealing the various potential forms of techno-feminist GameArt practice in China. Moreover, by creatively employing technology, their LFPs also echo the diversity, performativity, and hybridity of GameArt practice, enriching the scope of GameArt practice.

7.1.3 Significance of Sub-question 1 Results

The results from Sub-question 1 are fundamental in addressing the main research question regarding how an artist-led GameArt practice can provoke participants' reflections on gender stereotypes among women in China. By relocating GameArt practice as a performative worlding activity that integrates video game technologies with fine art to create interactive experiences, this study highlights its nature as a creative practice of inquiry and its potential as a medium for critical engagement and social commentary.

Understanding GameArt practice as a dynamic, ongoing practice where creators, participants, and various materials collaboratively construct and navigate virtual worlds provides insight into how techno-feminist principles can be integrated to challenge and reshape gender perceptions. This redefinition aligns GameArt pratcie closely with techno-feminist goals of questioning gender norms and promoting equality, positioning it as a platform that not only supports artistic expression but also serves as an interactive tool for societal critique.

Moreover, by establishing the foundational scope of GameArt practice, the study demonstrates how it can be employed strategically to engage women in reflective discussions about gender roles, thus addressing the main research question. The identification of GameArt practice as a form of performative worlding activity that encourages deep interaction and offers a new lens through which to view and challenge gender stereotypes underscores its capacity to influence broader cultural and technological discourses. Therefore, the significance of Sub-question 1 lies in providing a conceptual foundation that enhances the understanding of GameArt practice's role in socio-cultural discourse, particularly in the context of gender and technology.

7.2 Discussion of Sub-question 2

7.2.1 Overview

Sub-question 2: In which context could an artist-led GameArt practice informed by techno-feminist principles be effectively conducted in China? The results, derived from theoretical analysis, interviews with industry professionals, and group discussions in workshops, indicate that the artist-led GameArt practice informed by techno-feminist principles can effectively be conducted in the art field in China. Exploration of the second sub-question identifies the specific context for addressing and challenging gender stereotypes in China and guides the choice of context for unfolding research practice.

7.2.2 Explanation and Analysis of Sub-question 2 Results

7.2.2.1 Theoretical Aspect

Through the literature review, the study speculates that in China, the art field provides a feasible environment for conducting artist-led techno-feminist GameArt practice. This implies that GameArt practices possess unique characteristics and forms because of cultural and social differences, likely unfolding primarily within the art domain rather than the gaming industry.

7.2.2.2 Discussion of Interviews with Professionals

Interview feedback supports the speculation drawn from the literature review that the mainstream gaming industry in China currently faces significant challenges in adopting techno-feminist GameArt practices due to historical and cultural reasons. However, the art field, less constrained by commercial pressures and more open to diverse and critical explorations, is identified as a more viable environment for these practices. This insight reinforces the theoretical findings, suggesting that the art field offers more potential for integrating techno-feminist principles into GameArt practice.

7.2.2.3 Discussion of Participants' Feedback from Group Discussions

The workshop group discussions revealed nuanced views on adopting techno-feminist principles in artist-led GameArt practices in China. Feedback indicated that feminism in China is perceived as complex and more subtle, lacking practical localisation. This perception contributes to the conceptual confusion and disconnects from cultural narratives, which suggests that the adoption of techno-feminist in GameArt practice needs a more tailored approach in China. Participants also highlighted the influential role of art institutions in fostering discussions around techno-feminism and GameArt practice. They valued these workshops as platforms that offer new perspectives and promote critical reflections on traditional female roles and societal gender expectations. The ceremonial nature of these institutions was seen to enhance engagement and foster a conducive environment for profound, reflective discourse. Moreover, feedback on the workshop's supporting exhibition showed that integrating VR and immersive installations provided a comprehensive and impactful experience. These findings underscore the importance of the art field in conducting artist-led GameArt practices informed by techno-feminist principles in China, revealing that art institutions with their ability to draw the right audience and create a reflective atmosphere are particularly suited for such GameArt practice in China.

7.2.3 Significance of Sub-question 2 Results

The findings from Sub-question 2 reveal significant insights into the appropriate context for conducting the artist-led GameArt practice informed by techno-feminist principles in China, underlining the essential role of the art field as a conducive environment for such endeavours. This discovery is crucial for addressing the main research question because it identifies the art field, rather than the gaming industry, as the optimal setting for facilitating reflections on gender stereotypes through techno-feminist GameArt practice in China. Art institutions, with their capacity to foster more open discussions and critical engagement, provide the necessary creative and reflective space for women to challenge and reconsider societal gender norms in China. The feedback from participants and industry professionals underscores the effectiveness of these settings in promoting a more profound understanding and engagement with the themes explored in GameArt practices. By situating artist-led techno-feminist GameArt within art contexts, this study leverages the inherent qualities of these environments—such as their openness to diverse expressions and pursuit of spirituality—to enhance the impact of techno-feminist principles. This positioning amplifies the potential of the GameArt practice to provoke significant reflections among women participants, thereby directly supporting the overarching aim of influencing perceptions of gender roles in China. Thus, the results from sub-question 2 not only guide the conducting of the research practice but also ensure that it is rooted in an environment that maximizes its potential.

7.3 Discussion of Sub-question 3

7.3.1 Overview

Sub-question 3: Can this study's VR GameArt prototype, employing a female-focused narrative and the "mirror apparatus" as design strategies, facilitate reflection among participants on gender stereotypes in China? The results are derived from various aspects, including theoretical studies and feedback on specific prototype design elements from participants' group discussions in workshops. The findings indicate that the prototype not only incites reflection on gender

stereotypes but also influences their perceptions of Chinese women's traditional roles to varying degrees among participants. Moreover, participants' feedback delivers many insights regarding understanding the interplay between the GameArt design and participants. These outcomes provide an empirical case validating the efficacy of applying techno-feminist principles in GameArt and reveal specific designs' significance in influencing participants' perceptions of gender roles in China.

7.3.2 Explanation and Analysis of Sub-question 3 Results

7.3.2.1 Theoretical Aspects

The VR GameArt prototype serves as a critical component in this study, aiming to create an immersive interactive experience that influences participants' perceptions of socially constructed gender roles. The theoretical speculations from sub-question 3 guide the design of the prototype, closely focusing on provoking reflections on prevailing gender stereotypes in China. The use of VR technology enhances the prototype's ability to immerse participants in scenarios that challenge traditional gender roles. This strategic integration of thematic content and technological medium ensures that the prototype effectively facilitates a deeper understanding and questioning of gender stereotypes among its participants, aligning closely with the study's objectives.

7.3.2.2 Discussion of Participants' Feedback from Group Discussions

Participants' feedback on the prototype indicates that it not only effectively facilitated their reflection on gender stereotypes in China but also aroused participants' further exploration of associating their in-prototype reflections with real-life circumstances. Therefore, the prototype generally met its design expectations and aligned with the research aims.

7A) Discussion of Feedback on Female-Focused Narrative

7A.1) Discussion of Feedback on Background Stories and Ultimate Goal

Feedback on the prototype's background story and ultimate goal illustrates that this design aspect effectively exposed participants to themes of women's constraints and societal conditioning. By

unfolding the challenges of gender stereotypes faced by women in reality in the narrative through a science fiction approach, it not only effectively triggers participants' reflection on the game between the perception of their own female self-perception but also leads to further discussions on resolving these real-world issues faced by women. Therefore, feedback supports the substantiation of the prototype design's effectiveness.

7A.2) Discussion of Feedback on Scene and Task Design

The feedback concerning specific scenes and tasks within the VR GameArt prototype, particularly the "clock-in" and selfie tasks, highlights their effectiveness in engaging participants. Feedback suggests that mapping the real-life behaviour of selfies associated with gender stereotypes into the prototype's tasks can not only effectively advance the narrative in the prototype but also prompt continuous reflection on this behaviour in reality during participants' interaction. This reflection is crucial, as it not only deepens participants' understanding of the constructed nature of these gender stereotypes but also stimulates critical thinking about their personal and collective roles in perpetuating or challenging these societal gender expectations in China. This dynamic interaction within the prototype thus contributes to the objective of provoking a thoughtful examination of gender stereotypes.

7A.3) Discussion of Feedback on Situated Narrative

The VR GameArt prototype's utilisation of situated narrative and non-linear storytelling enhanced participants' engagement with the content, as evidenced by feedback emphasising the need to piece together narrative elements actively. Incorporating three nested timelines and multiple story paths effectively implied the complexity of identity and gender roles, allowing participants to interpret and participate in the narrative from multiple dimensions. This approach, combined with the use of the unreliable narrator, introduced ambiguity and multiple perspectives into the narrative, compelling participants to question and critically evaluate the information presented. This narrative responds to the complexity of gender stereotypes and challenges participants to reconsider their preconceived notions. The specific mirror stages within the prototype deepened this reflection, making the participants confront and reassess their self-perceptions and societal roles. These narrative strategies were pivotal in fostering a profound engagement with the themes of gender

stereotypes, demonstrating the prototype’s capacity to provoke thoughtful reflection and dialogue among participants.

7A.4) Discussion of Feedback on Illusions of Owning Agency

The design of "illusions of owning agency" received a significant response. It provoked numerous discussions and reflections among participants, highlighting the complex dynamics of autonomy and conformity within the context of gender stereotypes. Feedback suggests that these moments of women stereotypes not only mirrored the societal group pressures and gender stereotypes that shape women’s experiences in China but also prompted a deeper reflection on how such pressures influence individual choices and self-perception. This reflection is potent during tasks that simulated peer pressure, leading participants to confront the tension between personal identity and societal expectations. These insights are crucial for understanding the prototype’s impact on fostering critical reflection on the constraints and constructs of gender roles.

7A.5) Discussion of Feedback on “Mimesis”

The VR GameArt prototype employed "mimesis" as a design strategy to provoke critical reflection on gender stereotypes. Feedback shows that some design elements effectively engaged participants through its varied elements, fostering a distinct form of engagement with the theme of gender norms.

First, The immersive techno-pink in the prototype successfully triggered deep reflection and discussion among participants about gender stereotypes. The feedback illustrates how the colour pink, traditionally associated with femininity, served dual purposes in the context of the GameArt experience. Initially, some participants resisted the stereotypical implications of pink, viewing it as only a representation of females for thematic relevance. However, through interactive and critical discussions with workshop participants, they began perceiving it as a satirical tool, effectively using irony to challenge and critique these stereotypes. Moreover, because pink is uncommon in the technological realm, its integration with GameArt challenges traditional images of pink and femininity as soft and passive. It also subverts a male-dominated future imagination, usually using a blueish colour and cold tone. These reasons may be why some participants mentioned that they

found pink particularly appropriate for communicating the theme of technology and gender. This recontextualisation of pink not only challenged participants' preconceived notions but also emphasised the prototype's role in fostering a critical evaluation of cultural symbols associated with gender. The strategic absence of complementary colours made the pink more pronounced, pushing participants to consider its impact more critically and encouraging them to walk out of their comfort zones. Participants' feedback highlights the prototype's effectiveness in provoking reflection on gender representation and stereotypes, aligning with the prototype's design objectives.

Second, other exaggerated feminine elements, such as fur textures, garnered attention from some participants. However, it did not arouse ample concentration, possibly because, compared with pink, their designs in the prototype lacked sensory dominance and directness in terms of visual impact and represented meaning. While showing potential, they require more targeted further investigation to evaluate its effectiveness.

Third, the design of using the feather as a weapon to break glass cabinets elicited a profound resonance and emotional response from participants, which may be because, on the one hand, this design's counterintuitive nature: Defying real-world physical laws, it leveraged virtual technology and game language to achieve in the prototype. Therefore, it creates an incredible sensation when participants perform the action. On the other hand, the gentle quality of the feather-shattering sturdy glass cabinets embodied overcoming strength with softness, evoking associations with female power in participants. Experiencing this action in the immersive environment allowed participants to feel empowered and courageous, with some even relating it to female liberation. Feedback demonstrates that the adoption of video game technology and language to create this counterintuitive experience in IVEs effectively conveys the message: Seemingly fragile entities possess immense strength, which not only caused a more substantial emotional and reflective impact among participants but also sparked in-depth discussions about breaking stereotypes and real-life challenges through unconventional means. By engaging with this feature, participants explored themes of subtlety and force, reflecting on how unconventional

approaches—symbolised by the softness of a feather—can effectively confront and dismantle rigid gender stereotypes, aligning with the prototype's design objectives.

Fourth, the feedback on the ironic Code of Conduct was varied, which could stem from various factors, such as social-cultural background, previous gaming experiences, participants' expectations, goals, and cognitive load. Some participants resonated with the ironic content in the Code of Conduct, possibly because of the ubiquity of the women's issues it covers in society. Others perceived the continuous vocal delivery of the Code of Conduct as brainwashing, provoking a counterplay attitude, which aligns with the design's intention. However, some participants ignored the Code of Conduct; this could be attributed to the ironic content of the Code of Conduct delivered by audio, which might be a less attention-grabbing element than gameplay, tasks, or visuals when they experience and interact with the prototype. Moreover, it might relate to participants' habitual gaming experiences and perceptions, such as a tendency to skip narrators or believe them unimportant. These findings indicate that while the prototype's usage of the narrator to convey the ironic content in the Code of Conduct did trigger a degree of counterplay attitude in participants, the complexity of technological, cultural, and individual differences suggests a need for more targeted design and research to evaluate its effectiveness.

7A.6) Discussion of Feedback on Numerous Female NPCs

Discussion of Feedback on Numerous Female NPCs

The feedback on the design of Numerous Female NPCs (the crowd NPCs) indicates that many participants' interpretations of the visual elements of NPCs are largely related to their inherent impression of the cyber style. Some had emotions towards NPCs' standard beauty but hollow appearances, which may have stemmed from empathy and understanding for women in society who pursue outer perfection and standardised images. Others reflect on the herd behaviour exhibited by NPCs effectively and directly associate them with real-world situations. Feedback suggests that this design can promote reflection on gender stereotypes among participants to some degree. However, there is a need for a more targeted design and research to evaluate its effectiveness.

7B) Discussion of Feedback on the "Mirror Apparatus"

7B.1) Discussion of Feedback on the "Other"

The feedback on the "Other" within the VR GameArt prototype, specifically the crowd NPCs, provides valuable insights into how participants' interactions with these elements facilitated reflections on gender stereotypes. The "choosing comment" moment and the selfie task involving crowd NPCs effectively served as critical reflection points. Participants experienced a societal "gaze" that mirrored pressures in real life, particularly around conformity and female gender expectations. This setup allowed participants to confront internal conflicts and societal conditioning directly, which many described as enlightening. They explored the dynamic between personal willingness and societal expectations of women's roles, recognising the difficulty and implications of resisting socially constructed gender roles in real life compared to the virtual setting. Using NPCs to embody societal expectations and pressures facilitates a critical examination of gender stereotypes. It also encourages participants to reflect on and challenge these constructs in both virtual and real contexts.

The Forsaken NPC is encountered only by a couple of participants due to the character's role design requirements in Scene02. Some participants considered it a "rescue" symbol in Scene06, which aligns with its design's intention—however, the Forsaken NPC as Other needs more targeted design and research to evaluate its effectiveness.

7B.2) Discussion of Feedback on the "Big Other"

The "Big Other" in the VR GameArt prototype, as manifested through gameplay elements, rules, and the authoritative figure NR1, is crucial in stimulating participants' reflections on gender stereotypes in China. Participants' interactions with this "Big Other" served as a metaphor for the external pressures and societal expectations imposed on women, effectively communicated through the prototype's design. However, NR1's effectiveness as a "Big Other" still needs more research.

Feedback shows that the design of systemic values emerged as the most influential structural design. It may be because the system's values are embedded within the game's mechanics and

regulate the participants' experience and decisions. For example, the design of descending platforms and darkening scenes as forms of "punishment" for "wrong" choices created a visceral experience of oppression and panic. This design engaged participants in the dynamics of societal constraints and expectations, provoking them to consider real-world parallels in how women are often socially conditioned and judged. Such design choices made the experience more than just a virtual gaming experience; they transformed it into a reflective space for participants to contemplate the profound impact of societal expectations on female roles and the pressures to conform.

The NR1 character as the "Big Other" encapsulated the pervasive and often intrusive nature of societal expectations. Participants varied reactions to NR1—from feeling overwhelmed by its continuous dictates to experiencing it as a form of subconscious conditioning, leading to their response to NR1 either with a counterplay attitude or neglecting it (see 7A.4). Although NR1's function as the "Big Other" sparked counterplay attitudes in some participants, this response was often triggered more by the constant vocal output or a general tendency among participants to ignore narrators in video games, rather than due to disagreement with the content or values being expressed. Therefore, the design of NR1 as the "Big Other" requires more targeted design and research to assess its impact and effectiveness.

7B.3) Discussion of Feedback on Specific Mirror Stages

The specific mirror stages, particularly the filtered selfies and the virtual mirror (the first and third specific mirror stages), played a critical role in provoking deep reflections on gender stereotypes among participants. These stages effectively used technological interfaces to confront participants with varied representations of their selves, leading to substantial emotional and cognitive engagement.

These mirror stages allowed participants to explore the multiplicity of their self-images. They felt that these indirect methods of seeing their avatars in the prototype offered an experience similar to, yet slightly distinct from, self-identification, which sparked further discussions about the relationship between the avatar, identity, and self-perception. The filtered selfies led some to view the digital

representations as an objectification of the self. At the same time, some participants thought reflections in the virtual mirror were perceived as revealing a more authentic self. This gap between the avatar images and real self-perception sparked participants' discussions about the authenticity of self-representation in digital contexts. Moreover, the impact of seeing one's avatar from a 3PP, especially in a VR setting where the direct view of one's body is absent, intensified the dissonance between participants' perceived and projected identities. Also, the design elements like "faceless contours" in the virtual mirror effectively arouse some participants' reflections on the discrepancies between how individuals perceive themselves and how others perceive them.

Participants' feedback indicates that, on the one hand, the filtered selfie and virtual mirror, as mirror stages in the prototype, effectively provoked participants to explore the connection between themselves and their avatars. On the other hand, the design approach of the prototype, which involved reflecting different avatar images through various specific mirror stages, successfully disrupted participants' experiences and perceptions. This disruption prompted participants to explore and question their self-identity further, validating the intended effect of the prototype's design. Overall, participants' discussions and reflections underscore the potential of designing the first and third specific mirror stages in facilitating a critical examination of self-perception in the context of societal gender expectations, aligning with the prototype's design objectives.

The second specific mirror stage, the NPC Forsaken, was less encountered by experiencers (see 7B.1) because it is placed in the peripheral area of scene02 for narrative and artistic purposes. Feedback shows that most participants followed the prototype's main narrative route. Therefore, they did not encounter the NPC Forsaken. Only a few who encountered it mentioned what the NPC Forsaken said, which aroused their further thinking. However, this was due to the content spoken by the NPC Forsaken rather than the initial design intention to synchronise the NPC Forsaken's actions with the participants' motions in reverse, creating a reverse mirror effect that impacts the experiencers' self-perception. Consequently, the design of the second specific mirror stage requires more targeted design and research to assess its impact and effectiveness.

Feedback on the fourth specific mirror stage, out-of-body experience, varied in interpretation. Some delved deeper into discussions on the boundaries of the avatar, body and the constructed nature of the self; others expressed fondness and detailed descriptions of the experience but could not articulate specific reasons. This might be because the incredible sensory and visual responses from the out-of-body experience can overpower other feelings and leave a profound impression on participants. However, understanding the design's purpose behind it varies with individual differences. Therefore, the design of the fourth specific mirror stage requires more targeted design and research to assess its impact and effectiveness.

7C) Discussion of Feedback on the Use of VR

Feedback on the usage of VR reveals that, on the one hand, VR provides unprecedented opportunities for immersive experiences, demonstrating its potential for helping various prototype design elements to enhance or influence participants' perceptions. On the other hand, it also poses technical and physiological challenges, creating barriers to the experience. Despite several drawbacks of VR, its adoption in the prototype offers more intuitive and profound experiences for the participant to examine traditional female roles and societal gender expectations in China.

In summary, as discussed in sections 7A-7C, the prototype's design in focusing on women's narratives and "mirror apparatus" largely satisfied its intended design objectives. It not only provoking participants critically reflect on traditional female roles and societal gender expectations in China, but also aroused participants' further exploration of associating their in-prototype reflections with real-life circumstances. Specific aspects of the design, such as the use of techno-pink, selfie tasks, the feather weapon, the crowd NPCs as "Other," systemic values, and specific mirror stages 1 and 3, are particularly outstanding, sometimes even exceeding participants' expectations and generating new thoughts in discussions among participants. Others, like the ironic Code of Conduct delivered by the NR1, hairy texture and other exaggerated feminine elements, the Forsaken NPC, and specific mirror stages 2 and 4, showed some potential but were constrained either by the prototype's thematic requirements or technical limitations, requiring more targeted design and research to assess its impact and effectiveness.

7.3.3 Significance of Sub-question 3 Results

The findings from Sub-question 3, examining the effectiveness of the prototype in facilitating reflection on gender stereotypes among women in China, hold significant implications for the main research question. This sub-question focused on the prototype's design strategies, particularly incorporating a female-focused narrative and the "mirror apparatus." Many of the prototype's designs effectively engaged participants, prompting them to reconsider and reflect on socially constructed gender roles in China. Feedback indicates that the prototype's interactive elements and narrative techniques effectively provoked deep reflection on traditional female roles and societal gender expectations in China. This feedback suggests that an artist-led GameArt practice, when informed by techno-feminist principles and strategically designed, can provoke critical reflection among women participants. The prototype is also a catalyst for dialogue and self-examination, which influence participants' perceptions and align directly with the main research question's inquiry into the potential of artist-led techno-feminist GameArt pratice to challenge and reshape gender perceptions.

7.4 Discussion of Sub-question 4

7.4.1 Overview

Sub-question 4: What is the potential of an artist-led GameArt practice informed by techno-feminist principles in China? Its findings are derived from LFPs created by workshop participants and group discussions. The findings from Sub-question 4 highlight the effectiveness of techno-feminist GameArt practices in China in fostering critical dialogue on gender stereotypes and enhancing participant engagement and understanding. These practices, through workshops, build community, foster personal growth, and encourage women's active participation in the creative technological sector, aligning with the main research question.

7.4.2 Explanation and Analysis of Sub-question 4 Results

7.4.2.1 Discussion of Participants' LFPs

The outcomes of the LFPs created by workshop participants illustrate the potential of artist-led techno-feminist GameArt practice not only in facilitating the creation of a space for participants to examine traditional female roles and societal gender expectations in China but also in fostering learning and support. Each group's LFP explores different dimensions of gender stereotypes and societal expectations, using innovative GameArt methods to provoke reflection and dialogue.

Group 01 used VR and symbolic visual elements like cocoons to explore themes of societal integration and women's resulting loss of individuality. Their LFP represents a direct engagement with the broader societal labels that often confine and define women, using interactive technology to question and subvert these norms.

Group 02 utilised a Vtuber-style interaction to highlight appearance anxieties prevalent among women, directly addressing the impact of societal beauty standards on self-perception. Their use of live feedback and avatar modifications based on audience reactions cleverly mirrors the real-life dynamics of social media and public scrutiny, offering a unique perspective on the pressure to conform to aesthetic norms on women.

Group 03 focused on symbolic interaction through origami, emphasising the complexities surrounding women's reproductive choices and societal expectations. This tactile approach allowed participants to physically manipulate representations of these issues, making the abstract concerns tangible and thus fostering a deeper understanding and engagement.

Group 04's "Princess 3.0" used role-playing to confront and subvert traditional gender narratives, encouraging self-realisation and challenging the stereotypical roles assigned to women. By redesigning Snow White's story across different eras, this group promotes a narrative of self-empowerment and critical reflection on societal pressures regarding beauty and roles.

Group 05’s gender-neutral GameArt design leverages VR to explore identity and bodily experience, pushing the boundaries of traditional gender roles through avatars’ physical transformation. This approach enhances the narrative depth and promotes a broader understanding of identity beyond physical appearance.

These LFPs not only reflect participants’ deep understanding of GameArt practice but also showcase the potential of GameArt to serve as a powerful medium for exploring and addressing complex gender issues in innovative and impactful ways. Participants’ LFPs underscore the significant potential of artist-led GameArt practices to facilitate reshaping societal narratives about gender and empower individuals to reflect critically on their roles within these constructs.

7.4.2.2 Discussion of Feedback on Group Discussion

Discussion of Feedback on Understanding Techno-feminist GameArt Practice Before and After the Workshop

The group discussions revealed a significant shift in participants' understanding of techno-feminist GameArt practice. Initially unfamiliar with techno-feminism or GameArt practice, participants came to recognise its innovative integration of techno-feminist principles into GameArt practice. They acknowledged its utility in prompting them to rethink socially constructed gender roles. This transformation highlights the potential of techno-feminist GameArt practice to challenge traditional narratives in gaming and foster broader participation and diversity in the tech sector.

Discussion of Feedback on Advantages and Challenges of Techno-feminist Approach GameArt Practice in China

The group discussions on the potential of techno-feminist GameArt practice in China revealed a relatively optimistic outlook. Participants recognised the unique advantages of game language and media versatility, noting that these traits could significantly expand the audience base and enhance female participation, especially among the younger demographic. This expanded audience could facilitate more profound engagement with techno-feminist themes, enabling GameArt to serve as a medium for self-exploration and subverting traditional gender norms. Despite the enthusiasm, participants also acknowledged several challenges, including technical barriers, the need for

mainstream acceptance, and the nuanced interpretation of techno-feminism within Chinese cultural contexts. Overall, the feedback suggests that while there are hurdles to overcome, the transformative potential of techno-feminist GameArt in China is promising, with technological progress and cultural adaptation key to its success.

Discussion of Feedback on the Community-building

The group discussions during the workshops underscore the significant potential of artist-led techno-feminist GameArt practices in fostering a sense of community among participants and promoting women's engagement in the creative technology sector in China. Feedback from the workshops indicates that activities such as group discussions and the creation of LFPs were particularly effective in building a communal environment. These activities facilitated shared experiences and allowed participants to delve into meaningful dialogues about women's roles and gender stereotypes.

Participants appreciated the workshops' role in enhancing their understanding of techno-feminism and GameArt practices. Creating LFPs and engaging in reflective discussions provided them with practical insights into integrating techno-feminist principles into GameArt practice, which was seen as an enriching educational experience that extended beyond traditional artistic engagement. The collaborative nature of these activities not only contributed to a deeper personal understanding but also fostered a supportive network. Moreover, the feedback highlights the broader implications of promoting women's involvement in the technology and art fields. Participants suggested that more guidance from experienced practitioners in these hybrid areas could aid in nurturing future women professionals in China. Developing a feminist art theory that resonates with Chinese cultural contexts was also seen as crucial for providing a solid theoretical foundation for such practices. Additionally, increasing public awareness and creating more opportunities for women in the technology sector were identified as necessary steps towards broader societal change. These discussions underscore the need for supportive structures that encourage participation, lower technological barriers, and foster environments where women can confidently contribute to the creative technology sector in China.

These discussions reflect the potential of artist-led techno-feminist GameArt practices to not only challenge existing gender norms but also provide them with the tools and community support to explore and express their identities creatively and technically. This aligns with the broader goals of the study, showing that such practices can significantly impact participants' perspectives and contribute to cultural shifts in the perception of gender roles in China.

7.4.3 Significance of Sub-question 4 Results

The results from Sub-question 4 affirm the potential of artist-led techno-feminist GameArt practices in China. These practices not only serve as platforms for critically discussing entrenched gender stereotypes but also enhance participants' engagement and understanding of applying techno-feminist principles in creative practices. By incorporating workshops into the GameArt practice, participants' engagement with creation and other workshop activities demonstrates that such practices effectively cultivate a supportive environment for exchanging and learning, fostering a sense of agency among participants. This sense of community and the personal growth experienced by participants align with the main research question by illustrating how techno-feminist GameArt practices can catalyse critical reflection and inspire women to reconceptualise their roles within the technological and broader social contexts. This signifies a substantial impact on shifting perceptions and encouraging active participation of Chinese women in the creative technological sector, driving the integration of techno-feminist principles in GameArt practises and broader societal change.

7.5 Comprehensive Analysis of the Main Research Question

This research comprehensively explores how an artist-led GameArt practice, informed by techno-feminist principles, can provoke reflective thinking among Chinese women regarding prevailing gender stereotypes. Through a structured inquiry of four sub-questions, the study evaluates different dimensions of the artist-led techno-feminist GameArt practice and its effectiveness in fostering critical dialogues on gender roles.

Sub-question 1 relocates the GameArt practice, defining it as a form of performative worlding activity that integrates video game technology with artistic expression. This foundational understanding clarifies that GameArt practice is a creative practice of inquiry, where creators and participants, along with various materials, collaboratively engage in world-building and knowledge-making to shape or reshape reality. By establishing what constitutes GameArt practice, this sub-question sets the stage for understanding how such practices can serve as a medium for critical engagement and reflection on gender stereotypes. Sub-question 2 identifies the art field as a more conducive context for conducting a techno-feminist GameArt practice in China compared to the gaming industry. This sub-question underscores the potential of artist-led workshops at art institutions as spaces where challenging discussions and the questioning of gender norms can occur more freely and profoundly in China. The art context, known for its openness to diverse interpretations and its critical audience, offers an effective platform for these practices, facilitating more profound engagement with the themes of gender and techno-feminism.

Sub-question 3 assesses the impact of the VR GameArt prototype used in the study, which incorporates the female-focused narrative and "mirror apparatus" design strategies. The findings indicate that the prototype effectively engages participants in reflecting on gender stereotypes, utilising interactive and immersive elements to highlight and question socially constructed gender roles. This sub-question directly addresses how such technological and artistic integrations can provoke thought and encourage participants to reconsider their roles within societal gender frameworks. Sub-question 4 explores the broader potential of techno-feminist GameArt practices within China, revealing how these practices can extend beyond individual experiences to influence community perceptions. Participants' creation of LFPs and discussions around these prototypes illustrate the potential for GameArt to serve as a tool for broader societal engagement and transformation regarding gender roles.

In conclusion, these findings articulate that GameArt as a practice holds significant potential to influence participants' perceptions of traditional gender roles in China. Although it may take considerable time for artist-led techno-feminist GameArt practices to impact society broadly, these

practices can enhance engagement among Chinese women in the creative technological sector. They cultivate a space for critical discourse and facilitate the adoption of techno-feminist principles into creative practices, contributing to broader societal change.

7.6 Comparing Results with Expected Results

The actual results of this study align closely with the expected outcomes, confirming the effectiveness and transformative potential of GameArt practice. As anticipated, GameArt was indeed practised as a form of performative worlding activity, engaging participants deeply. The art field proved to be a conducive environment for conducting the artist-led techno-feminist GameArt practice, validating the context selection for the research practice. With its female-focused narrative and "mirror apparatus," the prototype successfully provoked reflections on gender stereotypes among participants, as predicted. Workshops within the art context effectively promoted participants' understanding and challenged their perceptions of socially constructed gender roles, confirming the significant potential of the artist-led techno-feminist GameArt practice. Overall, the results demonstrate that GameArt as a practice can influence participants' perceptions of traditional gender roles in China, supporting the initial expectations of the study's impact.

7.7 Comparing Research Results with Existing Studies

Compared to previous studies on video games and art, this research relocates GameArt practices as a form of performative worlding activity through a new materialist lens. The study reveals the "hybrid" relationship between video games and art manifested in these practices, analyses GameArt practices's characteristics and attributes, and proposes new terminologies. Existing research typically underscores the potential of the video game as a medium for social critique and gender discourse, often in European or American social and cultural contexts. This study contributes unique insights by examining the integration of techno-feminist principles in GameArt practice in China, highlighting cultural and social dynamics that influence the efficacy and reception of these practices. Moreover, most existing studies focus on the theoretical potential of using

feminist principles to critique video games or feminist video games’s potential to challenge gender norms and promote feminist ideologies. In contrast, this study provides empirical evidence of how GameArt practices informed by techno-feminist principles can provoke reflection on gender stereotypes among Chinese women specifically.

7.8 Research Contributions

This research contributes significantly to three main areas: First, this research contributes to three main apects: First, the research contributes to the fields of digital art and time-based media. GameArt practice, as a creative practice of inquiry, integrates video game technologies and fine art expression. It has often been celebrated for its innovative interdisciplinarity approach and transformative potential but lacks a structured academic foundation that adequately defines and supports its complexities. By relocating and critically defining GameArt practice, the research bridges the gap between the widespread practical application of GameArt as practice and the relative absence of rigorous academic scaffolding and terminology around the practice itself. Second, this research plays a pivotal role in advancing women's engagement in the creative technology sector by integrating and promoting techno-feminist principles within artistic practices in China. The study's exploration of how to apply techno-feminist principles in GameArt practice is crucial, as techno-feminist discourse is still developing in China, and its adoption is relatively underexplored. By focusing on techno-feminism, the study not only challenges prevailing gender stereotypes but also encourages the active participation of women in the creative technology sector, a field where they are traditionally underrepresented. Third, this research enriches the intersection of digital art, video games, and gender studies. Guided by new materialist theories, the prototype's design provides new insights into how these domains can interact to effectively promote gender perspectives and influence participants' perceptions within the creative process. The prototype emphasises the materiality and agency of technological and artistic elements, encouraging a deeper exploration of how technology mutually shapes women. Integrating techno-feminist principles further enhances this approach, challenging conventional gender roles and promoting inclusivity.

7.9 Research Impact and Significance

This research has implications across multiple domains. First, by defining and critically situating GameArt within academic discourse, the study enriches the theoretical landscape of digital art and time-based media. This endeavour provides a much-needed academic framework that supports the intricate nature of GameArt practice, facilitating further scholarly investigation and development within this innovative field. Second, the research impacts the creative technology sector by actively promoting the involvement of women, who are traditionally underrepresented in this area. Through the application of techno-feminist principles in artistic practice, this study not only challenges existing gender stereotypes but also fosters a conducive environment for women to engage and innovate in China. Third, integrating new materialist theories in the prototype design innovatively combines digital art, video game technology, and gender studies, enriching the method for examining the interaction between technology and gender. This synthesis promotes a nuanced understanding of how gender perspectives can be effectively incorporated into the design process, influencing broader societal views and contributing to the transformative potential of GameArt practices.

7.10 Research Limitations

The limitations of this study encompass a few aspects: First, this study is profoundly rooted in the artistic context. Although this approach provides a unique perspective and depth in the research, it implies that the study outcomes might carry a specific interpretive framework of the art domain, necessitating re-interpretation or adjustment when applied to non-artistic fields. Moreover, the uniqueness of the art context lies in its emphasis on subjectivity, emotion, and diversity of expression, differing from the scientific pursuit of objectivity, universality, and repeatability. Therefore, when translating the findings to other domains, it is crucial to consider the essential differences between art and non-art to ensure their effectiveness and applicability.

Second, the study's sample mainly consists of Chinese women with knowledge or interests in art, video games, and feminism. This selection enables an in-depth exploration of the experiences and opinions of this specific group. However, it also means that the research findings might reflect the perspectives of this specific group, not necessarily representing a broader population. Especially when discussing the potential of techno-feminist GameArt practice, this sample selection may limit the generalisability of the conclusions. Third, the study explores GameArt practices using VR, which, despite certain advantages in influencing participant perception, might alienate or exclude some participants, especially those unfamiliar with or who have problems experiencing VR, thereby influencing the research outcomes.

Fourth, although this study primarily focuses on the potential of techno-feminist GameArt practice to influence Chinese women's perceptions of traditional gender roles, the vast and diverse cultural regions and social class differences in China may limit the generalisability of the conclusions. This diversity requires considering different regions' cultural characteristics and social backgrounds when interpreting and disseminating its findings. Fifth, this study employs autoethnographic methodology, focusing on exploration through individual experiences, which can provide rich and in-depth insights. However, it may lead to subjectivity, which can make generalising the outcomes difficult.

In summary, this study provides situated knowledge within a specific context, and the research methodology, sample selection, and choice of specific technology influence its results. Considering the limitations carefully when applying these findings to related studies is crucial.

7.11 Suggestions for Future Research

Suggestions for future research based on this study's findings and the initial research framework are: First, future research could explore broader applications of techno-feminist principles in GameArt practices across different cultural contexts beyond China. It would provide a comparative analysis of how different societal norms impact the acceptance and effectiveness of techno-

feminist GameArt practices. Second, considering the evolving vitality of techno-feminism within GameArt practice, future research should involve a broader audience from diverse regional cultures and social strata. This expansion can enhance the understanding and application of techno-feminist principles across different cultural settings, promoting broader societal recognition and integration. Third, conducting longitudinal and comparative studies across different contexts to track changes in perceptions and the long-term impact of GameArt interventions could provide deeper insights into the enduring effects of these techno-feminist practices. Fourth, the advent of technologies such as AI offers new opportunities for innovation in GameArt. Future research could focus on how these technologies reshape GameArt practices, particularly their role in altering perceptions of female identity and addressing gender bias, thereby enhancing GameArt practices' transformative potential. Fifth, regarding the current prototype's success in provoking reflections on gender stereotypes, future research could explore the effectiveness of specific design elements and methods that have shown potential to impact participants' perceptions. This approach could help refine techniques that effectively integrate game language with female narratives, expanding the methods and impacts of techno-feminist GameArt. Sixth, future studies might investigate how GameArt can be effectively displayed and experienced in physical environments, going beyond digital realms to blend tangible and virtual experiences. This approach includes exploring innovative display formats and understanding the dual impact of GameArt in real and virtual contexts, enriching participants' experiences and the perceptual impacts of these artworks.

7.12 Self-reflections on Personal Practice

My journey through this autoethnographic practice-based research has combined deep self-reflection and working closely with my supervisors, Rachel Falconer and Professor William Latham, to ensure the direction and details of this study are proper. I have also carefully reviewed participants' feedback and undergone continuous self-reflection to grasp the technological engagements shaping this study and the participant involvement. My background, biases, experiences, and especially my dual role as an artist and researcher have significantly influenced

the research's design, conduct, and interpretation. Acknowledging this, I have strived to be critically aware of my influence on the research process.

The interviews with professionals mark a collaborative journey of exploration, revealing the importance of embracing diverse perspectives to foster dialogue and the necessity of openness to broaden and deepen the study's scope and impact. The prototype development made me aware of the potential of GameArt as a medium for feminist expression, as well as its limitations for shaping design choices and the barriers to accessibility that can arise in China. Moreover, as Karen Barad emphasises the ethical responsibility while worlding, I acknowledge the virtual worlds and rules that participants navigate are under a decision of mine. Therefore, I attempt to balance technical skill, creative vision, and feminist sensibility and an environment with careful considerations of ethics delicately.

Engagement with participants through workshops has been a source of invaluable insights and reflections. Observing participants' interactions with the prototype, their engagement with the workshop activities, responses to the themes presented, their desire to create and their emotions for empathy has provided a window into the impact of my work. This engagement has underscored the importance of creating spaces for dialogue and exploration around gender and technology in China. It has also challenged me to consider how my work can further foster a sense of community and support among women in the creative tech and art fields at a broad level.

I have also appreciated the iterative nature of practice-based research. From conceptualisation to execution and participant feedback and interactions, every step offered opportunities for learning and growth. This reflective journey has been a transformative process for evaluating the research outcomes. It has deepened my understanding of the complexities of advancing techno-feminism through GameArt practices in China and has reinforced my commitment to this field of inquiry.

Chapter 8: Conclusions

8.1 Recapitulation

This study explores the potential of integrating techno-feminist theories with GameArt practices to influence women's perceptions of gender roles within a Chinese socio-cultural context. The research is framed around the central question: How can an artist-led GameArt practice, informed by techno-feminist principles, provoke its women participants to reflect on gender stereotypes in China? Through a structured inquiry involving four sub-questions, the study evaluates various dimensions of the GameArt practice and its effectiveness in fostering critical dialogues on socially constructed gender roles in China. By relocating and defining GameArt practice, the study establishes a clear understanding of what constitutes GameArt practice. Then, the study identifies the art field as the specific context for utilising the artist-led techno-feminist GameArt practice to address and challenge gender stereotypes in China. Following by providing an empirical VR GameArt prototype to validate the efficacy of applying techno-feminist principles in GameArt, the study explores the broader potential of the artist-led techno-feminist GameArt practice by conducting a series of workshops within China. Methodologically, the study employed an autoethnographic approach, establishing a framework that integrates theory and practice. The theoretical underpinnings include techno-feminism and new materialism, guiding research and analysis.

The practical aspect of the research involved developing a VR GameArt prototype and conducting workshops in art institutions. The prototype focuses on female narratives and innovatively adopts a "mirror apparatus" design strategy to provoke participants to explore and reflect on their personal and societal experiences of gender stereotypes in China. Employing workshops as a practice allows for the immersive experience of the GameArt prototype, facilitating discussions and reflections on traditional female roles and societal gender expectations in China. Moreover, these workshops serve as crucial components for data collection and participant engagement, revealing insights into how participants perceive and interact with gender narratives within GameArt contexts. The aim of this study is to facilitate reflective dialogues of socially constructed gender

roles among future professionals at the intersection of technology and art by demonstrating the transformative potential of collaborations between video games and art that embody gender awareness. Ultimately, the research seeks to promote the active engagement of Chinese women in the creative technological sector.

8.2 Main Findings

The study relocates GameArt practice as a form of performative worlding activity, where creators and participants collaboratively engage in world-building and knowledge-making with various materials. The research demonstrates that an artist-led GameArt practice, informed by techno-feminist principles, effectively provokes reflections on gender stereotypes among Chinese women. The key finding indicates that the use of GameArt as a practice has the potential to influence perceptions of traditional gender roles in China. Although it may take time for artist-led techno-feminist GameArt practices to impact society broadly, these practices can enhance the engagement of Chinese women in the creative technological sector, cultivate spaces for critical discourse, and facilitate the integration of techno-feminist principles into creative practices.

8.3 Contributions and Significance

This research contributes to three main aspects: First, the study contributes to the fields of digital art and time-based media by creating, relocating, and applying the practice of GameArt. The study establishes a scope and precise term for GameArt practice, thereby bridging the gap between the widespread practical application of GameArt as practice and the relative absence of rigorous academic scaffolding and terminology around the practice itself. Secondly, this study is instrumental in promoting the involvement of women in China’s creative technology sector. By integrating techno-feminist principles in an artist-led GameArt practice, the study not only fosters critical reflections on prevailing gender stereotypes but also encourages the active participation of Chinese women in the creative technology sector, where women are traditionally underrepresented. This endeavour is significant as techno-feminist discourse is still developing,

and its adoption is relatively underexplored in China. Third, this research enriches the intersection of digital art, video games, and gender studies by bringing new understandings of the interplay between technology and women. Guided by new materialist theories, the prototype of this study highlights the agency and materiality of technological and artistic elements, facilitating a deeper investigation of how technology mutually shapes women. This approach is enhanced by integrating techno-feminist principles to challenge conventional gender stereotypes and promote inclusivity.

This research enriches the theoretical landscape of digital art and time-based media by providing an academic framework of GameArt practice that facilitates further exploration within these fields. It also promotes women's participation in the creative technology sector by applying techno-feminist principles, challenging gender stereotypes, and fostering inclusivity in China. Moreover, integrating new materialist theories in the prototype design merges digital art, video game technology, and gender studies, advancing the understanding of how technology and gender can interact creatively to influence societal perceptions.

8.4 Limitations

This study is deeply embedded in an artistic context, providing unique insights but necessitating careful reinterpretation when applied outside the art domain due to its emphasis on subjectivity and diversity. The participant sample, mainly Chinese women interested in art, video games, and feminism, offers depth but limits the findings' generalisability across broader populations. Moreover, the use of VR technology may exclude unfamiliar users, potentially biasing the results. The cultural and social diversity of the populations within China also challenges the broader applicability of the findings. The autoethnographic methodology enriches the study with detailed personal insights but introduces subjectivity that may affect the generalization of the results. These limitations suggest that the findings are context-specific and should be applied cautiously in other settings.

8.5 Future Research Directions

Suggestions for future research based on this study include exploring the application of techno-feminist principles in GameArt practices across various cultural contexts to analyse how societal norms affect their acceptance and effectiveness. Future studies could also target a broader audience to expand the understanding and integration of techno-feminist principles in GameArt practices. Moreover, longitudinal studies could track the long-term impacts of GameArt on perceptions of gender roles. Research into how emerging technologies like AI can enrich GameArt practices and their role in addressing gender bias could further enhance their transformative potential. Investigating the effectiveness of specific GameArt design elements that provoke reflection on gender stereotypes may refine approaches for integrating video game language with female narratives. Studying how GameArt can be displayed in physical environments would explore blending tangible and virtual experiences to enrich participant engagement and the impact of GameArt practice.

8.6 Conclusions

This research systematically explores the integration of techno-feminist principles within artist-led GameArt practices in China, revealing its potential to provoke critical reflection on gender stereotypes among Chinese women. The main research question—how can an artist-led GameArt practice, informed by techno-feminist principles, facilitate participants' reflection on gender stereotypes in China?—is dissected through four lines of inquiry. These address the scope and characteristics of GameArt practice, its optimal contexts in China, the practical impact of the VR GameArt prototype, and the broader potential of such practices.

Through a practice-based approach using mixed methods and guided by techno-feminism and new materialism theories, the research developed and evaluated a VR GameArt prototype that employed female-focused narratives and “mirror apparatus” design strategies. Moreover, by conducting workshops in art institutions, the study successfully creates a space for participants to

discuss and examine traditional female roles and societal gender expectations in China. Key findings of the study indicate that the use of GameArt as a practice has the potential to influence perceptions of traditional gender roles in China. Although it may take time for artist-led techno-feminist GameArt practices to impact society broadly, these practices can enhance the engagement of Chinese women in the creative technological sector, cultivate spaces for critical discourse, and facilitate the integration of techno-feminist principles into creative practices. The research contributes to academic discourse in digital art and time-based media by defining and critically relocating GameArt practice from a non-dualism perspective, bridging the gap between the widespread practical application of GameArt as practice and the relative absence of rigorous academic scaffolding and terminology around the practice itself. The study also plays a pivotal role in advancing women's engagement in the creative technology sector, highlighting the significance of expanding techno-feminist GameArt practices to broader audiences and emphasising the need for ongoing research to explore these intersections further.

In conclusion, this study highlights the transformative potential of GameArt practices in challenging perceptions of gender roles within China and promotes the active involvement of Chinese women in the creative technology sector by integrating techno-feminist principles. The insights gained in the study open multiple avenues for future research to explore the hybrid area of art and technology as catalysts for social change.

Bibliography

[1] W. Latham, “History of Computer Games, Art and Animation”, Goldsmiths, University of London, 2022.

[2] M. Krueger, “Videoplace,” Myron Krueger, https://aboutmyronkrueger.weebly.com/videoplace.html [Accessed 27 April 2023].

[3] "William Latham History", *Latham-mutator.com*. [Online]. Available: http://latham-mutator.com/. [Accessed: 27- Apr- 2022].

[4] G. Lai, F. Leymarie, W. Latham, T. Arita and R. Suzuki, "Virtual Creature Morphology - A Review", *State of the Art Reports*, vol. 40, no. 2, pp. 659-681, 2021. Available: https://onlinelibrary-wiley-com.gold.idm.oclc.org/doi/10.1111/cgf.142661. [Accessed 27 April 2022].

[5] J. Wajcman, *TechnoFeminism*. Cambridge : Polity. 2004, 2004.

[6] J. Wajcman, "Feminist theories of technology", *Cambridge Journal of Economics*, vol. 34, no. 1, pp. 143–152, 2009. Available: https://academic.oup.com/cje/article/34/1/143/1689542. [Accessed 15 March 2022].

[7] D. Haraway, *Manifestly Haraway*, 1st ed. Minneapolis: University of Minnesota Press, 2016, pp. 3-90.

[8] R. Pohl, *Donna Haraway’s A Cyborg Manifesto*, 1st ed. London: Macat International Ltd, 2018, pp. 9-67.

[9] S. Plant, *Zeros + ones : digital women + the new technoculture.* London: Fourth Estate, 1998.

[10] L. Elizabeth, "What can the digital humanities learn from feminist game studies?", *Digital Humanities Quarterly*, vol. 9, no. 2, 2015. Available: https://www.proquest.com/docview/2555207862?accountid=11149&parentSessionId=xuDY5J%2B823SYu76RF5A2e9nYvA%2BPZ0y8xu6UBjMSWEU%3D&pq-origsite=primo. [Accessed 15 March 2022].

[11] K. Jackson, "From Barbie to Mortal Kombat: Gender and Computer Games", *Journal of American and Comparative Cultures*, vol. 23, no. 3, pp. 125-126, 2000. Available: https://www-proquest-com.gold.idm.oclc.org/docview/200590034?pq-origsite=primo&accountid=11149. [Accessed 28 March 2022].

[12] J. Jenson and S. Castell, "Gender, Simulation, and Gaming: Research Review and Redirections", *Simulation & Gaming*, vol. 41, no. 1, pp. 51-71, 2010. Available: https://journals.sagepub.com/doi/10.1177/1046878109353473. [Accessed 28 March 2022].

[13] S. Humphreys, "On Being a Feminist in Games Studies", *Games and Culture*, vol. 14, no. 7-8, pp. 825-842, 2017. Available: https://doi-org.gold.idm.oclc.org/10.1177/1555412017737637. [Accessed 7 February 2022].

[14] A. Harvey and S. Fisher, ""Everyone Can Make Games!": The post-feminist context of women in digital game production", *Feminist Media Studies*, vol. 15, no. 4, pp. 576-592, 2015. Available: https://www.tandfonline.com/doi/full/10.1080/14680777.2014.958867. [Accessed 7 February 2022].

[15] N. Dahya, J. Jenson and K. Fong, "(En)gendering videogame development: A feminist approach to gender, education, and game studies", *Review of Education, Pedagogy, and Cultural Studies*, vol. 39, no. 4, pp. 367-390, 2017. Available: https://www.tandfonline.com/doi/full/10.1080/10714413.2017.1344508. [Accessed 7 February 2022].

[16] E. MacCallum-Stewart, "'Take That, Bitches!': Refiguring Lara Croft in Feminist Game Narratives", *Game Studies*, vol. 14, no. 2, 2014. Available: http://gamestudies.org/1402/articles/maccallumstewart. [Accessed 15 March 2022].

[17] H. Kennedy, "Game Jam as Feminist Methodology: The Affective Labors of Intervention in the Ludic Economy", *Games and Culture*, vol. 13, no. 7, pp. 708-727, 2018. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/1555412018764992. [Accessed 15 March 2022].

[18] T. Liu and Z. Lai, "From non-player characters to othered participants: Chinese women's gaming experience in the 'free' digital market", *Information, Communication & Society*, vol. 25, no. 3, pp. 376-394, 2022. Available: https://www.tandfonline.com/doi/full/10.1080/1369118X.2020.1791217. [Accessed 7 April 2022].

[19] W. Song and J. Fox, "Playing for Love in a Romantic Video Game: Avatar Identification, Parasocial Relationships, and Chinese Women's Romantic Beliefs", *Mass communication & society*, vol. 19, no. 2, pp. 197-215, 2016. Available: https://www.tandfonline.com/doi/full/10.1080/15205436.2015.1077972. [Accessed 7 April 2022].

[20] C. Kent, "Dismantling the Patriarchy, Bit by Bit: Art, Feminism, and Digital Technology," *Woman's Art Journal*, vol. 44, no. 1. Woman's Art, Inc, Philadelphia, p. 52, 2023.

[21] J. K. Brodsky, "Feminist Artists and the Gaming Industry," in *Dismantling the Patriarchy, Bit by Bit: Art, Feminism, and Digital Technology*, Bloomsbury Publishing, pp. 143–160

[22] J. Way, "Digital Art at the interface of Technology and feminism," *A Companion to Digital Art*, pp. 181–202, Mar. 2016. doi:10.1002/9781118475249.ch6

[23] Y. Han, “GameArtPractice< Worlding>.Performativity(1),” *Art Monthly* , no. 4, pp. 81–85, 2023.

[24] Y. Han, “GameArtPractice< Worlding>.Performativity(2),” *Art Monthly* , no. 5, pp. 70–73, 2023.

[25] D. Min, "DUIHUA (DIALOGUE) IN-BETWEEN A Process of Translating the Term ‘Feminism’ in China", *Interventions-International Journal of Postcolonial Studies*, vol. 9, no. 2, pp. 174-193, 2007. Available: https://doi.org/10.1080/13698010701409111. [Accessed 29 January 2022].

[26] X. Lu, "中国女性主义的发展与思辨/The Development and Speculation of Feminism in China ", *Prosecutorial View*, vol. 2019, no. 5, pp. 16-17, 2019. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2019&filename=SPMF201905014&uniplatform=NZKPT&v=OqiGwMIog4dgpy5T-20UIc67BHiM-g-X2K4aCpPx2Zpv4NGe-tP_PoAJ-ui_9LVW. [Accessed 3 February 2022].

[27] K. Wei, "女性主义理论在中国的发展——以人大复印报刊《妇女研究》(2003.1—2004.3)转载文献为基础/The Development of Feminism Theory in China - Based on the Literature Reprinted in the NPC Reprographic Journal Women's Studies (2003.1-2004.3) ", *Journal of Henan Normal University(Philosophy and Social Sciences Edition)*, vol. 2004, no. 03, pp. 104-108, 2004. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2004&filename=HNSK200403026&uniplatform=NZKPT&v=BjJYmrhEqsKK3klbuKkVKtlc-kuZpa4alHgwb3NQSR3GAWl6dz5Ib2lZYbSeBljw. [Accessed 3 February 2022].

[28] Y. Li, "西方女权运动的发展与中国女性主义的发端/The Development of the Feminist Movement in the West and the Beginnings of Feminism in China ", *Journal of Anshun University*, vol. 12, no. 5, pp. 20-22, 2010. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2010&filename=ASSZ201005009&uniplatform=NZKPT&v=u6qWa2ycfX50WKgZi4wd7KaEw8G9TURL7AT15dfgHHZ0FquU8-LcZMmSu8KZXr0m. [Accessed 3 February 2022].

[29] X. Dong, "中西方女性主义的比较分析及对我国高校性别教育的启示/A Comparative Analysis of Feminism in China and the West and Implications for Gender Education in Chinese Universities ", *Heilongjiang Researches on Higher Education*, vol. 2007, no. 7, pp. 44-46, 2007. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2007&filename=HLJG200707015&uniplatform=NZKPT&v=smvmSZEsIOont29hQwZp7eWAmADKtPDoP2l5FeDDw8iPV6UCMVR5iCsig2WeyDY_. [Accessed 3 February 2022].

[30] E. Elisabeth, "The Question of Women in Chinese Feminism", *Contemporary political theory*, vol. 5, no. 3, pp. 360-362, 2006. Available: https://www.proquest.com/docview/237043453?accountid=11149&parentSessionId=96hAD7Y3M7

wWv4yRFQ1hrCqnG5b0JXj4mRY%2FHJrn1O0%3D&pq-origsite=primo. [Accessed 4 February 2022].

[31] T. Barlow, *The question of women in Chinese feminism*. Duke University Press, 2004.

[32] E. DuBois, "How Tani Barlow Answers The Question of Women in Chinese Feminism", *Journal of Women's History*, vol. 20, no. 1, pp. 227-230, 2008. Available: https://muse-jhu-edu.gold.idm.oclc.org/article/233226. [Accessed 4 February 2022].

[33] G. Yang and Z. Liu, "浅析西方女权主义对中国女性发展的启示/An Analysis of the Implications of Western Feminism for the Development of Chinese Women", *Sinogram Culture*, vol. 2019, no. 07, pp. 131-132, 2019. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2019&filename=HZWZ201907066&uniplatform=NZKPT&v=C8Cyt6DkYPsBsQ64Tz6I99mkSMg0F3AFxs1Sdd10_AxGbcFwCiIT2uDf2o1dZwhI. [Accessed 4 February 2022].

[34] A. Peng, "A techno-feminist analysis of beauty app development in China's high-tech industry", *Journal of Gender Studies*, vol. 30, no. 5, pp. 596-608, 2021. Available: https://doi.org/10.1080/09589236.2021.1929091. [Accessed 29 January 2022].

[35] J. Chang, H. Ren and Q. Yang, "A virtual gender asylum? The social media profile picture, young Chinese women's self-empowerment, and the emergence of a Chinese digital feminism", *International Journal of Cultural Studies*, vol. 21, no. 3, pp. 325-340, 2018. Available: https://doi-org.gold.idm.oclc.org/10.1177/1367877916682085. [Accessed 29 January 2022].

[36] S. Liao, "Wang Hong Fashion Culture and the Postfeminist Time in China", *Fashion Theory*, vol. 25, no. 5, pp. 663-685, 2021. Available: https://doi.org/10.1080/1362704X.2019.1638158. [Accessed 29 January 2022].

[37] C. Wallis and Y. Shen, "The SK-II #changedestiny campaign and the limits of commodity activism for women's equality in neo/non-liberal China", *Critical Studies in Media Communication*, vol. 35, no. 4, pp. 376-389, 2018. Available: https://www-tandfonline-com.gold.idm.oclc.org/doi/full/10.1080/15295036.2018.1475745. [Accessed 11 May 2022].

[38] B. Meng and Y. Huang, "Patriarchal capitalism with Chinese characteristics: gendered discourse of 'Double Eleven' shopping festival", *Cultural Studies*, vol. 31, no. 5, pp. 659-684, 2017. Available: https://www.tandfonline.com/doi/full/10.1080/09502386.2017.1328517. [Accessed 7 February 2022].

[39] P. Ngai, "Subsumption or Consumption? The Phantom of Consumer Revolution in 'Globalizing' China", *Cultural Anthropology*, vol. 18, no. 4, pp. 469-492, 2003. Available: https://www.proquest.com/docview/213149390?accountid=11149&parentSessionId=okpQ%2BV%2BETKIq60mHZnX9WJ%2BFq1hSiuAMFwgURnNn9Eg%3D&pq-origsite=primo. [Accessed 7 February 2022].

[40] A. Anagnost, "The Corporeal Politics of Quality (Suzhi)", *Public Culture*, vol. 16, no. 2, pp. 189-208, 2004. Available: https://muse-jhu-edu.gold.idm.oclc.org/article/169125. [Accessed 7 February 2022].

[41] L. Hou, "Rewriting “the personal is political”: young women's digital activism and new feminist politics in China", *Inter-Asia Cultural Studies*, vol. 21, no. 3, pp. 337-355, 2020. Available: https://doi.org/10.1080/14649373.2020.1796352. [Accessed 7 February 2022].

[42] X. Li, "How powerful is the female gaze? The implication of using male celebrities for promoting female cosmetics in China", *Global Media and China*, vol. 5, no. 1, pp. 55-68, 2020. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/2059436419899166. [Accessed 11 March 2022].

[43] J. Yang, "Nennu and Shunu: Gender, Body Politics, and the Beauty Economy in China", *Signs: Journal of Women in Culture and Society*, vol. 36, no. 2, pp. 333-357, 2011. Available: https://www-journals-uchicago-edu.gold.idm.oclc.org/doi/full/10.1086/655913. [Accessed 6 May 2022].

[44] G. Xu and S. Feiner, "Meinü Jingji/China's beauty economy: Buying looks, shifting value, and changing place", *Feminist economics*, vol. 13, no. 3-4, pp. 307-323, 2007. Available: https://www.tandfonline.com/doi/full/10.1080/13545700701439499. [Accessed 6 May 2022].

[45] W. Qi, "Young Feminist Activists in Present-Day China: A New Feminist Generation?", *China Perspectives*, no. 3, pp. 59-68, 2018. Available: https://www.proquest.com/docview/2126796728?accountid=11149&parentSessionId=AZOhTrKXLDqwu1qqnCVLLgvyNk7rskpsk1nnLnlBRx8%3D&parentSessionId=temd8j3dSSEfheIWEoolFLxWcqKiHJnW4Hw0qabLYgk%3D&pq-origsite=primo. [Accessed 12 March 2022].

[46] W. He, "游戏角色、玩家体验与性别化代码: 游戏研究的性别想象/Game Characters, Player Experience, and Gendered Code: A Gendered Imaginary for Game Studies", *Journal of China Women's University*, vol. 32, no. 3, pp. 99-105, 2020. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2020&filename=ZNXY202003015&uniplatform=NZKPT&v=Ihb23bmr8nebiG2r3TgefZFj6mds9PDaZ8DePy6rxXtTHQZGzLiQn_u4Ma7GdcfT. [Accessed 15 March 2022].

[47] W. Liang, H. Yang and W. Liang, "数字游戏亚文化实践中的女性青年——从女性游戏角色、女玩家到游戏女主播/Young Female’s Practices in digital gaming subcultural - From Female Game Characters, Female Gamers to Female Game Streamers", *China Youth Study*, vol. 2017, no. 3, pp. 13-18,61, 2017. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2017&filename=ZGQL201703002&uniplatform=NZKPT&v=qu0SaX7g_8oyqaHVq3zQe06s01MFRLDm0VaKsdJ6Or4CnPlVPmTH3h1boAUcVEo2. [Accessed 15 March 2022].

[48] Y. Huang, "计算机游戏与性别关系——性别研究的新领域/Computer games and Gender Relations - A New Field of Gender Studies", *Social Sciences Abroad*, vol. 2001, no. 5, pp. 44-50, 2001. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2001&filename=GWSH200105006&uniplatform=NZKPT&v=DS04zt9th7xPjg5Q_dMdGA3BXGpLBhNhaRAVgBEkpzJe3Il1EmBW62nEr3FyC-br. [Accessed 15 March 2022].

[49] S. Wu, "网络游戏中女性意识缺失的反思/Reflections on the Lack of Feminine Consciousness in Online Games ", *Zhejiang Social Sciences*, vol. 2008, no. 4, pp. 72-77,128, 2008. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2008&filename=ZJSH200804014&uniplatform=NZKPT&v=llzP3enNAgs74KwCvNdxte-Qt1tNT4mblhrU5MjHHoZTiFG_fI3ROlW7_3GziG5N. [Accessed 15 March 2022].

[50] X. Yang and J. Chen, "错位的角色肯定:网络游戏中的青年女性身份认同:一次个案的观察与分析/Dislocated Role Affirmation: Young Women's Identity in Online Games: An Case Study and Analysis ", *Lanzhou Academic Journal*, vol. 2009, no. 10, pp. 146-150, 2009. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2009&filename=LZXK200910040&uniplatform=NZKPT&v=PdN_qnjQpXz0TbWq-YyrF_84qRdorJXSYKyGkKKvz5ct1n6U1vsRvq1Xldnefz60. [Accessed 15 March 2022].

[51] S. Kuang and M. Mei, "网络游戏中的青年女性互动行为与身份认同——基于《阴阳师》用户的实证研究/Young Women's Interaction Behavior and Identity in Online Games - An Empirical Study Based on Onmyoji Users ", *Southeast Communication*, vol. 2018, no. 1, pp. 63-66, 2018. Available: https://t.cnki.net/kcms/detail?v=Fbtljxa2noagpN38YE2_NRr11E5ADfE2gXHzIua1WUfIBeA75Z4nZMv5WgsxnJy0GrkIGMaYdwBNhdVuyb9ktHlW6wOY4jZGqjV2sBzYmL00v1H-B8Bt7d-AofUA0kvc&uniplatform=NZKPT. [Accessed 15 March 2022].

[52] W. Li, "电子游戏的女性角色与女性玩家研究:回顾与展望/Research on Female Characters and Female Players in Video Games: A Review and Prospects", *Journal of Yangtze Normal University*, vol. 37, no. 2021, pp. 35-46, 2021. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2021&filename=FLSZ202102005&v=jWLUMqLvfmkoOEJclopRH8I%25mmd2Ff4IcyneeIZw8TDq5SE7m4mFzkAEnObco6LtBnhps. [Accessed 18 July 2021].

[53] Y. Liu and H. Chen, "乙女向手游社群中的女性身份与空间建构——以《恋与制作人》手游为例/The Construction of Women's Identity and Space in Otome-oriented Video Game Communities: A Case Study of Video game " Mr Love: Queen's Choice" / ", *Home Drama*, vol. 2019, no. 29, pp. 227, 229, 2019. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2019&filename=XJZT201929150&uniplatform=NZKPT&v=r1qMIiYDEojoKhCpts9vgu6Ps3DXuZF0eg-E4fNjaBwD0ws9FLzhbGRVnmcyO7it. [Accessed 15 March 2022].

[54] W. Ye, "货不对板的女性主义题材游戏研究——以《最后生还者 2》为切入点/A Study of Feminist Titles in Goods - The Last Survivor 2 as an Entry Point", *Beijing Culture Creativity*, vol. 2021, no. 3, pp. 80-89, 2021. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2021&filename=BJWH202103012&uniplatform=NZKPT&v=7cxP_WbXmd9J9vkUxSMJwWp5s7VsWng7HNVTXY7zr5t-tSjbuK_ni0PBIOdXa0DW. [Accessed 15 March 2022].

[55] L. Huang, "幻想与认同:女性向游戏中玩家的心理分析/Fantasy and Identity: An Psychological Analysis of Players in Female-oriented Games", *Today's Massmedia*, vol. 27, no. 5, pp. 70-72, 2019. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2019&filename=BKZY201905022&v=wvbvF9rJGcpeAulUUYWExwW6zUPqngU3MGMe8AVSH5fKDLH5QL4hsTVq1NrEz7Yu. [Accessed 18 July 2021].

[56] Y. Xie, "对中国女性向手机游戏发展历程中女性用户群体的解读/An Interpretation of Female User Groups in the Development of Female-oriented mobile Games in China", *Radio & TV Journal*, vol. 2018, no. 5, pp. 151-152, 2018. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2018&filename=SHIT201805082&v=36yxDOEm1AB5UdAGYu%25mmd2Ffnrj0nQ4EVK8ngHb43pVM47hqo%25mmd2BmZUXG3FeGQeoI%25mmd2FOoGI. [Accessed 18 July 2021].

[57] Y. Chen, "融媒体时代--乙女游戏中的女性主义和沉浸式传播研究/Age of Integrated Media: Research on the Feminism and Immersive Communication in the Otome Game", *China Digital Cable TV*, vol. 2020, no. 5, pp. 541-544, 2020. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2020&filename=YXDS202005030&v=AYZ4XtE1B4Bw7otuOfUTTLUnBev%25mmd2BFRfGbjgsBf8nDxvzS8uxDBMRcXtL2As1Fksl. [Accessed 18 July 2021].

[58] Y. Li and W. Wang, "手游《恋与制作人》社群营销模式分析/Analysis of the Community Marketing Model of the Video Game Mr Love: Queen's Choice", *Market Weekly*, vol. 2018, no. 4, pp. 72-74, 2018. Available: https://t.cnki.net/kcms/detail?v=Fbtljxa2noagpN38YE2_NRr11E5ADfE2gXHzIua1WUdKCQnnBfCljDFGFqj1NSDk2CkClMuhgx0miT_pHOfvJ1G6Pxnsv-5jo8GkmPD28iZ5exOLaxRckpnPZh6gW_Bw&uniplatform=NZKPT. [Accessed 15 March 2022].

[59] S. Cao and D. Dong, "傲慢与偏见——对女游戏玩家性别刻板印象的研究/Pride and Prejudice - A Study of Gender Stereotypes of Female Gamers ", *Arts Criticism*, vol. 2018, no. 11, pp. 38-49, 2018. Available: https://t.cnki.net/kcms/detail?v=Fbtljxa2noagpN38YE2_NRr11E5ADfE2gXHzIua1WUepmWY95Qr1YIPn-QbzKf_M3hXlUurjI704vPuAwBIh8zyqtTNxnUuu_i0IEfymOvRTaHiT6yzDCZGueuTWFKDj&uniplatform=NZKPT. [Accessed 15 March 2022].

[60] D. Wang and M. Fan, "网络游戏中的女性形象探析/An Exploration of the Female Portrayal in Online Games", *Journal of Central South University(Social Sciences)*, vol. 12, no. 2, pp. 247-250,254, 2006. Available: https://t.cnki.net/kcms/detail?v=Fbtljxa2noagpN38YE2_NRr11E5ADfE2gXHzIua1WUf6k7hkG41CtwnH6TYNv8XYoRTsgIv9FDJGLvoA_XWGuzauSJIr5g3waY0MsDaiK4_CuvGjAb8vdg==&uniplatform=NZKPT. [Accessed 15 March 2022].

[61] C. Wen and X. Zhou, "恋爱·游戏·白日梦:女性向恋爱类游戏的心理作用机制分析/Love-Game-Daydreams: An Analysis of the Psychological Mechanisms of Female-targeted Love Games", *Arts Criticism*, vol. 2018, no. 8, pp. 41-50, 2018. Available: https://t.cnki.net/kcms/detail?v=Fbtljxa2noagpN38YE2_NRr11E5ADfE2gXHzIua1WUepmWY95Qr1YLR_Uv7C6d2_WBglOQEQA8RAM2Kkzaho7vSfM8t_2Jz6ZZpPHgp1y4KZTxXZ6Q4TehhQtdmcIV-0&uniplatform=NZKPT. [Accessed 15 March 2022].

[62] Y. Xie, "对中国女性向手机游戏发展历程中女性用户群体的解读/An Interpretation of Female Users in the Development of Female-targeted Mobile Games in China", *Radio & TV Journal*, vol. 2018, no. 5, pp. 151-152, 2018. Available: https://t.cnki.net/kcms/detail?v=Fbtljxa2noagpN38YE2_NRr11E5ADfE2gXHzIua1WUegILp-Na0kx0jCxmTViLTFl2ReGl27831uyzU3L5UnecY7SOkix0YWAdvhwRca1F5iVZysGb8RriH_MqkSCUI3&uniplatform=NZKPT. [Accessed 15 March 2022].

[63] Y. Sun, "针对女性玩家的游戏界面设计研究/A Study of Game Interface Design for Female Players", *The Science Education Article Collects*, vol. 2015, no. 1, pp. 185-186, 2015. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2015&filename=KJWH201511088&uniplatform=NZKPT&v=FdCBeqQRnAqlQAtncU9n-enRgEBE0dYmaRoNpL1_wWvPH5aXdjPxTTqRCJNcFFew. [Accessed 15 March 2022].

[64] Y. Wu, Y. Sun, N. Zhu and X. Shi, "乙女类电子游戏对女性玩家理想恋爱观的影响/The Impact of Otome Video Games on Female Players' Ideal View of Relationships", *Youth Studies*, vol. 2020, no. 4, pp. 56-70,96, 2020. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2020&filename=QNYJ202004006&uniplatform=NZKPT&v=6Q8kOY8hsNg9iVKwJsqJZNpsTsi7Z_jMhArDS5h4Ms9qE2pITdR4Iku04m7pP9xV. [Accessed 15 March 2022].

[65] L. Chan, "Liberating or Disciplining? A Technofeminist Analysis of the use of Dating Apps Among Women in Urban China", *Communication, Culture and Critique*, vol. 11, no. 2, pp. 298–314, 2018. Available: https://academic.oup.com/ccc/article/11/2/298/4956846. [Accessed 20 March 2022].

[66] Y. Han, “Interview with Miaoyi Wang,” Beijing, China, 2022.

[67] Y. Han, "Interview with Die Gui", Beijing, China, 2022.

[68] Y. Han, "Interview with Jue Baiyu", Beijing China, 2022.

[69] Y. Han, "Interview with CWY", Beijing China, 2022.

[70] Y. Cao and J. Downing, "The realities of virtual play: video games and their industry in China", *Media, Culture & Society*, vol. 30, no. 4, pp. 515-529, 2008. Available: https://doi-org.gold.idm.oclc.org/10.1177/0163443708091180 [Accessed 20 July 2021].

[71] J. Deng, "中国电子游戏文化的源流与考辨/The Origin and Identification of Chinese Video Game Culture ", *Shanghai Culture*, vol. 2020, no. 12, pp. 45-51+125, 2020. [Online]. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2021&filename=PSHW202012006&v=sEa%25mmd2FZ7wmR7ySokX6GQ9Jg5zjtQdjS1EaydOc3Cy%25mmd2BGw%25mmd2ByfULfm0QDFqIzmvfM%25mmd2FRL0 [Accessed 26 July 2021].

[72] "中国游戏发展历程与现状分析/Analysis of The History and current Situation of Game Development in China", *Wenku.baidu.com*. [Online]. Available: https://wenku.baidu.com/view/fabf9d869cc3d5bbfd0a79563c1ec5da50e2d6ab.html [Accessed: 21- Jul- 2021].

[73] General Office, CPC Central Committee，General Office of the State Council of the People's Republic of China, "国家'十二五'时期文化改革发展规划纲要/Outline of the National Cultural Reform and Development Plan for the 12th Five-Year Plan", www.gov.cn, 2012. [Online]. Available: http://www.gov.cn/jrzg/2012-02/15/content_2067781.htm[Accessed 6 August 2021].

[74] State Council of the People's Republic of China, “国务院关于推进文化创意和设计服务与相关产业融合发展的若干意见/Several Opinions of the State Council on Promoting the Integrated Development of Cultural, Creative and Design Services and Related Industries", State Council of the People's Republic of China, 2014. [Online]. Available: http://www.gov.cn/zhengce/content/2014-03/14/content_8713.htm[Accessed 6 August 2021].

[75] Ministry of Culture of the People's Republic of China, "文化部关于贯彻落实《国务院关于推进文化创意和设计服务与相关产业融合发展 的若干意见》的实施意见/The Ministry of Culture on the Implementation of the State Council’s Several Opinions of the State Council on Promoting the Integrated Development of Cultural, Creative and Design Services and Related Industries", http://www.gov.cn, 2014. [Online]. Available: http://www.gov.cn/gongbao/content/2014/content_2723639.htm [Accessed 6 August 2021].

[76] CGIGC, "中国游戏产业报告 2020/China Gaming Industry Report 2020", CGIGC, 2020. [Online]. Available: http://www.cgigc.com.cn/gamedata/22132.html [Accessed 16 August 2021].

[77] "游戏工委发布《2021 年 1-6 月中国游戏产业报告》/CGIGC Releases China Games Industry Report January - June 2021", *CGIGC*, 2021. [Online]. Available: http://www.cgigc.com.cn/info/22277.html [Accessed: 13- Aug- 2021].

[78] R. Liu, "2021 年中国游戏行业市场监管现状与发展趋势分析:行业监管将趋于严格/Analysis of The Current Situation and Development Trend of China's Game Industry Market Regulation in 2021: The Industry Regulation Will Tend to Be Stricter. ", *FORWARD-THE ECONOMIST*, 2021. [Online]. Available: https://www.qianzhan.com/analyst/detail/220/210720-99bf5baa.html [Accessed: 13- Aug- 2021].

[79] CGIGC, "中国游戏产业报告 2018/China Gaming Industry Report 2018", CGIGC, 2018. [Online]. Available: http://www.cgigc.com.cn/gamedata/20752.html [Accessed 16 August 2021].

[80] N. Kshetri, "The Evolution of the Chinese Online Gaming Industry", *Journal of Technology Management in China*, vol. 4, no. 2, pp. 158-179, 2009. [Online]. Available: https://libres.uncg.edu/ir/uncg/f/N_Kshetri_Evolution_2009.pdf [Accessed 27 July 2021].

[81] L. Zhang, "Productive vs. Pathological: The Contested Space of Video Games in Post-Reform China (1980s–2012)", *International Journal of Communication*, vol. 7, no. 2013, pp. 2391-2411, 2013. [Online]. Available: https://ijoc.org/index.php/ijoc/article/view/2066 [Accessed 27 July 2021].

[82] Central Committee of the Communist Party of China State Council, "关于进一步加强和改进未成年人思想道德建设的若干意见/Several Opinions on Further Strengthening and Improving the Ethical and Moral Development of Minors", www.gov.cn, 2004. [Online]. Available: http://www.gov.cn/gongbao/content/2004/content_62719.htm [Accessed: 25- Jul- 2021].

[83] "中国青少年网络协会绿色游戏推荐标准草案/Draft of China Youth Network Association Green Game Recommendation Standard", *Tech.sina.com.cn*, 2004. [Online]. Available: https://tech.sina.com.cn/i/2004-11-10/1209456958.shtml [Accessed: 26- Jul- 2021].

[84] National Press and Publication Administration, "国家新闻出版广电总局关于移动游戏出版服务管理的通知/the National Press and Publication Administration’s Notice on the Management of Mobile Games Publishing and Services", http://www.nppa.gov.cn/, 2016. [Online]. Available: http://www.nppa.gov.cn/nppa/contents/312/23602.shtml [Accessed: 13- Aug- 2021].

[85] The State Council Information Office of the People’s Republic of China, "中宣部等多部门联合印发《关于严格规范网络游戏市场管理的意见》/Opinions on Regulating the Management of Online Game Market ", www.scio.gov.cn, 2018.

[86] "八部门部署实名验证工作实施网游防沉迷系统/Eight Departments Deploy Real Name Verification Work Implementing Anti-addiction System for Online Games", *Tech.qq.com*, 2011. [Online]. Available: https://tech.qq.com/a/20110729/000304.htm [Accessed: 14- Aug- 2021].

[87] Ministry of Culture, "文化部关于规范网络游戏运营加强事中事后监管工作的通知/Notice of the Ministry of Culture on Regulating the Operation of Online Games and Strengthening the Supervision Work in the Matter Afterwards", Ministry of Culture, 2016. [Online]. Available: http://www.gov.cn/xinwen/2016-12/07/content_5143968.htm [Accessed: 14- Aug- 2021].

[88] National Press and Publication Administration, "图表:《关于防止未成年人沉迷网络游戏的通知》提出的六方面举措/Chart: The Six Initiatives Proposed in the Notice on Preventing Minors from Being Addicted to Online Games", http://www.gov.cn/, 2019.

[89] Y. Han and X. Wang, "女性向游戏的溯源、类型及模式解析/An Analysis of the Origin, Genres and Models of Female-oriented Games", *Modern Communication(Journal of Communication University of China)*, vol. 42, no. 6, pp. 141-146, 2020. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2020&filename=XDCB202006026&uniplatform=NZKPT&v=hXjNjcrf3oclo6sBwtTbHKd3AuNRkvBG2y01SxqBBaiRF_NAoz50Nrl6Nw07Nokg. [Accessed 15 March 2022].

[90] L. Huo and D. Mi, "替代性满足:亲密关系视角下手游 《恋与制作人》的用户研究/Alternative Satisfaction: User Research of Mobile Games Mr Love: Queen's Choice" from the Perspective of Intimate Relationship", *Southeast Communication*, vol. 2018, no. 6, pp. 112-115, 2018. [Online]. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2018&filename=DNCB201806038&uniplatform=NZKPT&v=xlGYR60hTjEhbfecJ59Z3myt67JYvyVQQ1kQ822o1gHkYONcMtLHPpNlOa-cV_fR. [Accessed 16 March 2022].

[91] Y. Han, "Interview with ZY", Shanghai, China, 2022.

[92] Y. Han, "Interview with GZM, and LYF", Beijing China, 2022.

[93] CGIGC, "中国游戏产业报告 2019/China Gaming Industry Report 2019", CGIGC, 2019. [Online]. Available: https://www.cgigc.com.cn/details.html?id=5c15ccff-ffc8-11eb-ae89-000c29a9423b&tp=report [Accessed 9 March 2022].

[94] "《2021 年中国游戏产业报告》正式发布/China Game Industry Report 2021 was Officially Released ", *CGIGC.com.cn*, 2021. [Online]. Available: https://www.cgigc.com.cn/details.html?id=08d9c37e-e046-495c-8348-3dd4185ab794&tp=report. [Accessed: 09- Mar- 2022].

[95] Y. Han, "Interview with Yan", Beijing, China, 2022.

[96] The State Council of the People's Republic of China, "互联网信息服务管理办法/State Council Decree No. 292: Internet Information Service Management Measures", the State Council of the People's Republic of China, Beijing, 2000. [Online]. Available: http://www.gov.cn/gongbao/content/2000/content_60531.htm [Accessed 24 July 2021].

[97] "新闻出版总署关于实施"中国民族网络游戏出版工程"的通知/Notice of the General Administration Press and Publication "Chinese National Online Game Publishing Project ", *Wenku.baidu.com*. [Online]. Available: https://wenku.baidu.com/view/3596b7a253d380eb6294dd88d0d233d4b04e3ffc.html?re=view [Accessed: 25- Jul- 2021].

[98] the State Council of the People’s Republic of China, "国务院机构改革方案/Institutional Reform Programme of the State Council", http://www.gov.cn/, 2018. [Online]. Available: http://www.gov.cn/guowuyuan/2018-03/17/content_5275116.htm [Accessed 6 August 2021].

[99] U.S.-China Economic and Security Review Commission, "China’s Digital Game Sector", U.S.-China Economic and Security Review Commission, 2018. [Online]. Available: https://www.uscc.gov/sites/default/files/Research/China's%20Digital%20Game%20Sector.pdf[Accessed 6 August 2021].

[100] National People's Congress, "中华人民共和国国民经济和社会发展第十四个五年规划和 2035 年远景目标纲要/Outline of the Fourteenth Five-Year Plan and Vision 2035 of the National Economic and Social Development of the People's Republic of China", http://www.gov.cn/, 2021. [Online]. Available: http://www.gov.cn/xinwen/2021-03/13/content_5592681.htm [Accessed 13 August 2021].

[101] "《2023 年中国游戏产业报告》正式发布/China Game Industry Report 2023 was Officially Released", *CGIGC.com.cn*, 2023. [Online]. Available: https://www.cgigc.com.cn/details.html?id=08db8e52-b8e5-44d6-8b66-24369f9bef13&tp=report. [Accessed: 09- Mar- 2022].

[102] “School of Animation and Games,” *China Academy of Art.* [Online]. Available: https://en.caa.edu.cn/study/schoolsdepartments/schoolofanimationandgames. [Accessed: 05-Apr-2023].

[103] L. Dong, "女性主义:本土化及其维度/Feminism: Indigenization and Its Dimensions", *Nankai Journal(Philosophy,Literature and Social Science Edition)*, vol. 2005, no. 2, pp. 7-12, 2005. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2005&filename=LKXB200502001&uniplatform=NZKPT&v=_H6afPBHohIzC983315m7vmnM0dQ3DNB2GYL1GgeLbyK2FiGj4_OgZQJH93FKoP4. [Accessed 4 February 2022].

[104] F. Xu, "Chinese Feminisms Encounter International Feminisms", *International Feminist Journal of Politics*, vol. 11, no. 2, pp. 196-215, 2009. Available: https://doi.org/10.1080/14616740902789567. [Accessed 29 January 2022].

[105] Z. Wang, "浅议社会性别学在中国的发展/An Introduction to the Development of Gender Studies in China", *Sociological Studies*, vol. 2001, no. 05, pp. 34-44, 27, 2001. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2001&filename=SHXJ200105002&uniplatform=NZKPT&v=zrqUxiZC_Eh9zJ94r1s0uI64TWnc2t5QDczPbUBdewcO99bObRPcbqXZuYlk5x19. [Accessed 4 February 2022].

[106] X. Li and X. Zhang, "Creating a Space for Women: Women's Studies in China in the 1980s", *Signs: Journal of Women in Culture and Society*, vol. 20, no. 1, pp. 137-151, 1994.

Available: https://www-jstor-org.gold.idm.oclc.org/stable/3174930?seq=2#metadata_info_tab_contents. [Accessed 5 February 2022].

[107] D. Min, "From Men-Women Equality to Gender Equality: The Zigzag Road of Women's Political Participation in China", *Asian Journal of Women's Studies*, vol. 17, no. 3, pp. 7-24, 2011. Available: https://www.proquest.com/docview/900320414?accountid=11149&parentSessionId=QBdznvLbpX7cf6ZEFy6rjFZKCEJFTLm7X8yGbCZflOU%3D&pq-origsite=primo. [Accessed 3 February 2022].

[108] A. Wu and Y. Dong, "What is made-in-China feminism(s)? Gender discontent and class friction in post-socialist China", *Critical Asian Studies*, vol. 51, no. 4, pp. 471-492, 2019. Available: https://doi.org/10.1080/14672715.2019.1656538. [Accessed 7 February 2022].

[109] J. Li and X. Li, "Media as a core political resource: the young feminist movements in China", *Chinese Journal of Communication*, vol. 10, 2017, no. 1, pp. 54-71, 2017. Available: https://www.tandfonline.com/doi/full/10.1080/17544750.2016.1274265. [Accessed 21 March 2022].

[110] Z. Lin and Y. Liu, "Individual and collective empowerment: Women's voices in the #MeToo movement in China", *Asian Journal of Women's Studies*, vol. 25, no. 1, pp. 117-131, 2019. Available: https://www-proquest-com.gold.idm.oclc.org/docview/2289556086?accountid=11149&pq-origsite=primo. [Accessed 21 March 2022].

[111] Y. Samson, "Friend or Foe?: The Diminishing Space of China's Civil Society", *China Perspectives*, vol. 2015, no. 3, pp. 51-56, 2015. Available: https://www.proquest.com/docview/1713637755?accountid=11149&parentSessionId=zrLe3kGytQLD1NzTKF4Rz2ACvCu%2Bwev1f0JM9FRYT0M%3D&pq-origsite=primo. [Accessed 11 March 2022].

[112] H. Hou, "On Fire in Weibo: Feminist Online Activism in China", *Economic and Political Weekly*, vol. 50, no. 17, pp. 79-85, 2015. Available: https://www-jstor-org.gold.idm.oclc.org/stable/24481829?seq=2. [Accessed 21 March 2022].

[113] Q. Wang, "From “Non-governmental Organizing” to “Outer-system”—Feminism and Feminist Resistance in Post-2000 China", *NORA - Nordic Journal of Feminist and Gender Research*, vol. 26, no. 4, pp. 260-277, 2018. Available: https://www.tandfonline.com/doi/full/10.1080/08038740.2018.1531058. [Accessed 11 March 2022].

[114] Z. Wang, "Detention of the Feminist Five in China", *Feminist Studies*, vol. 4, no. 2, pp. 476-482, 2022. Available: https://www.proquest.com/docview/1708819055?accountid=11149&parentSessionId=Tzf45C%2Fn

Q5TuV7LrAXaHkFWslW5wIVXBkqSfa1WR24Y%3D&pq-origsite=primo. [Accessed 7 February 2022].

[115] Y. Tao and E. David, "Off the Margins: Twenty Years of Chinese Women's Art (1990–2010)", *positions: asia critique*, vol. 28, no. 1, pp. 65-86, 2020. Available: https://muse-jhu-edu.gold.idm.oclc.org/article/749134. [Accessed 21 March 2022].

[116] P. Karetzky and E. Zhang, The Art of Women in Contemporary China : Both Sides Now, *https://ebookcentral.proquest.com/lib/goldsmiths/detail.action?docID=6010900&pq-origsite=primo*, 1st ed. Cambridge Scholars Publisher, 2020.

[117] Y. Han, "The Connotation and Significance of Contemporary Chinese Women's Art/中国当代女性艺术的内涵与意义", *National Art Museum of China Journal*, vol. 2011, no. 3, pp. 12-18, 2011. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDN0911&filename=ZGMG201103005&uniplatform=NZKPT&v=ObSw79EA33A3cMzZN0R3c6S_gXYZRgz6e0rMfEyOR2e_dzGviaE-0O2c-Qpeo34J. [Accessed 21 March 2022].

[118] "In Art, a Strong Voice for Chinese Women (Published 2012)", *Nytimes.com*. [Online]. Available: https://www.nytimes.com/2012/03/08/world/asia/08iht-letter08.html. [Accessed: 22- Mar- 2022].

[119] K. TERRY , “How to live in Beijing for FREE: Student stays in Chinese capital for three weeks without spending a penny by disguising herself as a socialite,” *Daily Mail*, Daily Mail.com, Dec. 8, 2021.

[120] P. Zhang , “China’s ‘fake socialite’: student who lived for free for art school project caught up in wealth inequality controversy,” *myNEWS*, scmp.com, Oct. 6, 2021.

[121] S. Liao, "Japanese Console Games Popularization in China: Governance, Copycats, and Gamers", *Games and Culture*, vol. 11, no. 3, pp. 275-297, 2015. Available: https://doi-org.gold.idm.oclc.org/10.1177/1555412015583574 [Accessed 21 July 2021].

[122] The State Council of the People's Republic of China, "出版管理条例/State Council Decree No. 343：Publication Regulations", the State Council of the People's Republic of China, 2001. [Online]. Available: http://www.gov.cn/banshi/2005-08/21/content_25110.htm [Accessed 24 July 2021].

[123] "《互联网出版管理暂行规定》/Interim Provisions on Internet Publication Administration 2002", *Chinadaily.com.cn*. [Online]. Available: http://www.chinadaily.com.cn/hqkx/2006-04/18/content_570707.htm [Accessed: 24- Jul- 2021].

[124] Ministry of Culture of the People's Republic of China, "《2009 年中国网络游戏市场白皮书》解读/Interpretation of the 2009 China Online Game Market White Paper", www.scio.gov.cn, 2009.

[Online]. Available: http://www.scio.gov.cn/zhzc/8/5/Document/1432348/1432348.htm[Accessed: 24- Jul- 2021].

[125] Newzoo, "Newzoo Global Games Market Report 2021 | Free Version", Newzoo, 2021. [Online]. Available: https://newzoo.com/insights/trend-reports/newzoo-global-games-market-report-2021-free-version/[Accessed 6 August 2021].

[126] Q. Zhu, "洞察 2021：中国游戏行业竞争格局及市场份额(附市场集中度、企业竞争力评价等)_行业研究报告/Insight 2021: Competitive Landscape and Market Share in China's Gaming Industry (with Market Concentration, Enterprise Competitiveness Evaluation, etc.) ", *Qianzhan.com*, 2021. [Online]. Available: https://www.qianzhan.com/analyst/detail/220/210713-3a9f03be.html [Accessed: 19- Aug- 2021].

[127] "Incorruptible Warrior - Wikipedia", *En.wikipedia.org*. [Online]. Available: https://en.wikipedia.org/wiki/Incorruptible_Warrior [Accessed: 29- Jul- 2021].

[128] "《2019 年中国游戏行业发生了这几件大事：电竞、直播、未成年》/Big Things Happened in China's Gaming Industry in 2019: Esports, Live Streaming, Underage", *Games.sina.com.cn*, 2019. [Online]. Available: http://games.sina.com.cn/y/n/2019-12-25/ihnzahi9899995.shtml. [Accessed 29 Aug 2021].

[129] "Mr Love: Queen's Choice", *Play.google.com*. [Online]. Available: https://play.google.com/store/apps/details?id=com.elex.paper.lovegp&hl=zh&gl=US. [Accessed: 11- Jul- 2022].

[130] "周棋洛上时代广场银幕啦/Zhou Qiluo is on the Times Square screen!", *9game.cn*, 2018. [Online]. Available: https://www.9game.cn/lyzzr/2263693.html. [Accessed: 16- Jun- 2022].

[131] T. Lemke," Varieties of materialism ", *BioSocieties, Special Issue: Neurosciences beyond the laboratory*, vol. 10, no. 4, pp. 490-495, 2015. Available: https://www.proquest.com/docview/1733730414/78FADE629914A15PQ/1?accountid=11149. [Accessed: 27- Jan- 2023].

[132] I. Tuin and R. Dolphijn, *New Materialism: Interviews & Cartographies*. Open Humanities Press, 2012.

[133] C. Gamble, J. Hanan and T. Nail, " WHAT IS NEW MATERIALISM?", *Angelaki: Journal of the Theoretical Humanities*, vol. 24, no. 6, pp. 111-134, 2019. Available: https://postcolonial.net/wp-content/uploads/2019/11/spivak_readingarchive.pdf. [Accessed：29-April-2022].

[134] N. Fox and P. Alldred, “New materialism”, *The SAGE Encyclopedia of Research Methods,* P. Atkinson, S. Delamont, M. Hardy, and M. Williams, Ed., London: Sage, 2018.

[135] J. Bennett, “Vibrant Matter: A Political Ecology of Things,” http://carbonfarm.us/,

http://carbonfarm.us/555/bennetexcerpt.pdf [Accessed: 27- Aug- 2023].

[136] K.Barad, *Meeting the Universe Halfway:Quantum Physics and the Entanglement of Matter and Meaning*, Duke University Press, 2007.

[137] W. Stark, “Intra-action,” newmaterialism.eu, https://newmaterialism.eu/almanac/i/intra-action.html (accessed Jan. 1, 2024).

[138] R Braidotti, “Nomadic Subjects: Embodiment and Sexual Difference in Contemporary Feminist Theory,” https://joaocamillopenna.files.wordpress.com，https://joaocamillopenna.files.wordpress.com/2019/10/rosi-braidotti-nomadic-subjects_-embodiment-and-sexual-difference-in-contemporary-feminist-theory-columbia-university-press-1994.pdf [Accessed: 27- Aug- 2023].

[139] R Braidotti, “Transpositions: On Nomadic Ethics ,” https://joaocamillopenna.files.wordpress.com，https://joaocamillopenna.files.wordpress.com/2017/03/braidotti-transpositions-on-nomadic-ethics.pdf [Accessed: 27- Aug- 2023].

[140] R Braidotti, “The Posthuman”, http://faculty.las.illinois.edu, http://faculty.las.illinois.edu/rrushing/395/ewExternalFiles/Braidotti%20Posthuman.pdf [Accessed: 27- Aug- 2023].

[141] R. Falconer, "CRITICAL WORLDING", Goldsmiths, University of London, 2022.

[142] T. Page, *PLACEMAKING -A NEW MATERIALIST THEORY OF PEDAGOGY*. Edinburgh University Press Ltd, Edinburgh, 2020.

[143] "Martin Heidegger (Stanford Encyclopedia of Philosophy)", *Plato.stanford.edu*. [Online]. Available: https://plato.stanford.edu/entries/heidegger/#BeiWor. [Accessed: 13- Jul- 2022].

[144] P. Cheah, "Worlding Literature: Living with Tiger Spirits", *Diacritics*, vol. 45, no. 2, pp. 86-114, 2017. Available: https://muse-jhu-edu.gold.idm.oclc.org/article/691227. [Accessed 13 July 2022].

[145] "Hannah Arendt (Stanford Encyclopedia of Philosophy)", *Plato.stanford.edu*. [Online]. Available: https://plato.stanford.edu/entries/arendt/. [Accessed: 13- Jul- 2022].

[146] G. Spivak, "The Rani of Sirmur: An Essay in Reading the Archives", *History and Theory*, vol. 24, no. 3, pp. 247-272, 1985. Available: https://postcolonial.net/wp-content/uploads/2019/11/spivak_readingarchive.pdf. [Accessed 29 April 2022].

[147] M. Raja, "Worlding", *Postcolonial Space*, 2019. [Online]. Available: https://postcolonial.net/glossary/worlding/. [Accessed: 29- Apr- 2022].

[148] H. Palmer and V. Hunter, "Worlding", *newmaterialism.eu*, 2018. Available: https://newmaterialism.eu/almanac/w/worlding.html. [Accessed 29 April 2022].

[149] N. Mauthner, “A Posthumanist Ethics of Mattering: New Materialisms and the Ethical Practice of Inquiry”, *The SAGE Handbook of Qualitative Research Ethics,* R. Iphofen and M. Tolich, Ed., London: Sage, 2018.

[150] K. Barad, “Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter,” *Signs: Journal of Women in Culture and Society*, vol. 28, no. 3, pp. 801–831, 2003, doi: 10.1086/345321.

[151] "Media Art Net | VNS Matrix: All New Gen", *Medienkunstnetz.de*. [Online]. Available: http://www.medienkunstnetz.de/works/all-new-gen/. [Accessed: 27- Apr- 2022].

[152] "The Artists／VNS Matrix", *VNS Matrix*. [Online]. Available: https://vnsmatrix.net/the-artists. [Accessed: 27- Apr- 2022].

[153] V. Matrix, “All new gen／vns matrix,” VNS Matrix, https://vnsmatrix.net/projects/all-new-gen [Accessed 27 April 2023].

[154] S. Treister , “Fictional Videogame Stills,” Suzanne Treister - Amiga videogame stills - menu, https://www.suzannetreister.net/Ampages/Amenu.html [accessed Aug. 22, 2023].

[155] M. Bittanti, “Interview: Orhan Kipcak (ArsDoom, ArsDoom II) (1995-2005),” *GAMESCENES*, Nov. 4, 2009.

[156] C. Arcangel, "Home", *Coryarcangel.com*. [Online]. Available: https://coryarcangel.com/. [Accessed: 25- May- 2022].

[157] A. Washko, “angelawashko.com”, angelawashko.com. [Online]. Available: https://angelawashko.com/home.html. [Accessed: 13- Oct- 2020].

[158] R. Slovin , “Hot circuits: Reflections on the first museum retrospective of the video arcade game,” Moving Image Source, http://www.movingimagesource.us/articles/hot-circuits-20090115 [Accessed 27 April 2023].

[159] K. Stuart, “How the Barbican turned video games into a global arts tour,” *The Guardian*, Mar. 3, 2015.

[160] A. Tucker, “The Art of Video Games,” *Smithsonian Magazine*, Mar. 2012.

[161] "Play dys4ia | 100% Free Online Game | FreeGames.org", *FreeGames.org*. [Online]. Available: https://freegames.org/dys4ia/#. [Accessed: 27- Apr- 2022].

[162] "Triple A Games Dot Biz - Anna Anthropy", *Triple-a-games.biz*. [Online]. Available: http://triple-a-games.biz/. [Accessed: 27- Apr- 2022].

[163] A. Burak and L. Parker, "The power of Twine：An excerpt from the book Power Play", *Polygon*, 2017. Available: https://www.polygon.com/2017/2/2/14484616/power-play-excerpt. [Accessed 27 April 2022].

[164] A. Anthropy, *Rise of the videogame zinesters : how freaks, normals, amateurs, artists, dreamers, dropouts, queers, housewives, and people like you are taking back an art form*, 1st ed. New York: Seven Stories Press, 2012.

[165] Y. Han, "HAN YAJUAN +", *HAN YAJUAN* +. [Online]. Available: https://hanyajuan.org. [Accessed: 27- Apr- 2022].

[166] "Jacolby Satterwhite - Morán Morán", *Morán Morán*. [Online]. Available: https://moranmorangallery.com/artists/jacolby-satterwhite/. [Accessed: 25- May- 2022].

[167] “Wisdoms for love 3.0 (trimester 1),” *Keiken,* 12-Jan-2022. [Online]. Available: https://keiken.cloud/work/wisdoms-for-love-3-0/. [Accessed: 05-Apr-2023].

[168] "Lena NW", *Lenanw.com*. [Online]. Available: https://www.lenanw.com/. [Accessed: 21- Mar- 2022].

[169] S. Weiss, "WOMAN OF INTEREST: Lena NW Brings Rap, Gaming, and the Apocalypse to Life with Nightmare Temptation Academy", *Audiofemme*, 2020. Available: https://www.audiofemme.com/woman-of-interest-lena-nw-nightmare-temptation-academy-album-video-game/. [Accessed 28 April 2022].

[170] "Nightmare Temptation Academy – IndieCade", *Indiecade.com*. [Online]. Available: https://www.indiecade.com/nightmare-temptation-academy/. [Accessed: 27- Apr- 2022].

[171] "The Great Adventure of Material World – Game in Progress – LUYANG.ASIA", *Luyang.asia*. [Online]. Available: http://luyang.asia/2019/11/14/the-great-adventure-of-material-world-game-in-process/. [Accessed: 25- May- 2022].

[172] [450] Victoria and Albert Museum, “About the Videogames exhibition,” Victoria and Albert Museum, https://www.vam.ac.uk/articles/about-videogames-exhibition [accessed Aug. 22, 2023].

[173] M. Khaos, “Videogames: Design/Play/Disrupt at the V&A,” *The Upcoming*, Sep. 6, 2018

[174] “重识游戏——首届功能与艺术游戏大展”于中央美术学院美术馆开幕/Redefining Games: The First Exhibition of Functional and Artistic Games’ Opened at the Art Museum of the Central Academy of Fine Arts”, *Central Academy of Fine Arts*. Sep. 11, 2018

[175] A. Greenberger, “How Playing ‘Elden Ring’ Influenced Hans Ulrich Obrist’s New Show About Video Games and Art,” *Art News*, Jun. 7, 2022

[176] "Zitao YE", *Xpaidia.com*. [Online]. Available: https://xpaidia.com/cv/. [Accessed: 22- Mar- 2022].

[177] J. Huizinga, “*HOMO LUDENSA*: Study of the Play-Element in Culture”, THE SOCIOLOGY OF CULTURE: 9volumes, no. III, Oxford: Routledge, 1949.

[178] A. Clarke and G. Mitchell, *Videogames and art*, 1st ed. Bristol: Intellect Books, 2007.

[179] N. Kelman and H. Jenkins, *Video Game Art* ; New York: Assouline Publishing, 2005.

[180] M. Flanagan, *Critical play: radical game design.* Cambridge, Mass.: MIT Press, 2009.

[181] R. Ebert, "Video games can never be art", *Rogerebert.com*, 2010.

[182] J. Gee, "Why Game Studies Now? Video Games: A New Art Form", *Games and Culture*, vol. 1, no. 1, pp. 58-61, 2006. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/abs/10.1177/1555412005281788. [Accessed 27 April 2022].

[183] B. Lüneburg, "Between Art and Game: Performance Practice in the Gamified Audiovisual Artworks of GAPPP", *The Computer Games Journal volume*, vol. 7, no. 4, pp. 243–260, 2018. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s40869-018-0066-7. [Accessed 27 April 2022].

[184] C. Thi Nguyen, " Games and the Art of Agency", *The Philosophical review*, vol. 128, no. 4, pp. 423-462, 2019. Available: https://doi-org.gold.idm.oclc.org/10.1215/00318108-7697863. [Accessed 1 Jan 2023].

[185] M. Bittanti, "EVENT: WORLDBUILDING: GAMING AND ART: 15TH ANNIVERSARY (JUNE 5, 2022–DECEMBER 10, 2023, JSC DÜSSELDORF)", *GAMESCENES*, 2022. [Online]. Available: https://www.gamescenes.org/2022/02/event-15th-anniversary-exhibition-on-gaming-and-art-june-5-2022december-10-2023-jsc-d%C3%BCsseldorf.html. [Accessed: 23- May- 2022].

[186] R. Sprugnoli, M. Guerini, G. Moretti and S. Tonelli, "Are these Artworks Similar? Analysing Visitors’ Judgements on Aesthetic Perception with a Digital Game", *Journal on Computing and Cultural Heritage*, vol. 14, no. 4, pp. 1–14, 2021. Available: https://dl-acm-org.gold.idm.oclc.org/doi/10.1145/3461663. [Accessed 27 April 2022].

[187] E. Bertozzi, "The Art of video games: from Pac-Man to Mass Effect", *CHOICE: Current Reviews for Academic Libraries*, vol. 49, no. 12, p. 2320, 2012. Available: https://www-proquest-com.gold.idm.oclc.org/docview/1032977791?pq-origsite=primo&accountid=11149. [Accessed 27 April 2022].

[188] I. Jones, "Review: The Art of Video Games: From Pac-Man to Mass Effect", *CAA.Reviews*, 2015. Available: https://web.s.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=0&sid=5a41947f-cbfb-4968-bae5-a7d99de9fcea%40redis. [Accessed 27 April 2022].

[189] L. Grace, *Heuristics from Curating and Exhibiting Game Art in the 21st Century*. 2017.

[190] Y. Sekhavat, "KioskAR: An Augmented Reality Game as a New Business Model to Present Artworks", *International Journal of Computer Games Technology*, vol. 2016, 2016. Available: https://www.hindawi.com/journals/ijcgt/2016/7690754/. [Accessed 27 April 2022].

[191] C. Díaz and W. Tungtjitcharoen, "Art Video Games: Ritual Communication of Feelings in the Digital Era", *Games and Culture*, vol. 10, no. 1, pp. 3-34, 2014. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/1555412014557543. [Accessed 27 April 2022].

[192] T. Holmes, “Arcade Classics Spawn Art? Current Trends in the Art Game Genre”, in *Proceedings of the 5th International Digital Arts, 2003,* [Online]. Available:https://www.academia.edu/2998560/Arcade_Classics_Spawn_Art_Current_Trends_in_the_Art_Game_Genre. [Accessed: 20- Jan- 2023].

[193] M. Bittanti, "Game Art", *gardensandmachines.com*, Available: https://www.gardensandmachines.com/AD41700/gameart_eng-2.pdf. [Accessed 1 Jan 2023].

[194] J. Sharp, *Works of game: on the aesthetics of games and art.* Cambridge, Mass.: MIT Press, 2015.

[195] F. Parker, "An Art World for Artgames", *The Journal of the Canadian Game Studies Association*, vol. 7, no. 11, pp. 41–60, 2013. Available: https://journals.sfu.ca/loading/index.php/loading/article/view/119/160. [Accessed: 1 Feb 2023].

[196] "Hans Ulrich Obrist on how video games are revolutionising the art world", *dazeddigital.com*. [Online]. Available: https://www.dazeddigital.com/art-photography/article/56316/1/hans-ulrich-obrist-interview-worldbuilding-gaming-art-digital-age-exhibition. [Accessed: 19- Jan- 2023].

[197] "Home - Rebecca Allen", *Rebeccaallen.com*. [Online]. Available: http://rebeccaallen.com/home. [Accessed: 25- May- 2022].

[198] "slimetech.org", *Slimetech.org*. [Online]. Available: http://slimetech.org/. [Accessed: 25- May- 2022].

[199] A. Washko, "Screenshot of 'The Game, The Game' gameplay video," 2018. [Online]. Available: https://angelawashko.com/artwork/4480845-The%20Game%3a%20The%20Game%20%28gameplay%20video%29.html. Accessed: Mar. 7, 2021.

[200] "Feng Mengbo: Q4U", *Www-news.uchicago.edu*, 2002. [Online]. Available: http://www-news.uchicago.edu/releases/02/020109.q4u.shtml. [Accessed: 21- Mar- 2022].

[201] "Long, March, Restart — 21st Century Digital Art", *21st Century Digital Art*. [Online]. Available: http://www.digiart21.org/art/feng-mengbos-long-march-restart. [Accessed: 21- Mar- 2022].

[202] "NET ART ANTHOLOGY: RMB City", *NET ART ANTHOLOGY: RMB City*. [Online]. Available: https://anthology.rhizome.org/rmb-city. [Accessed: 21- Mar- 2022].

[203] L. NW, "Screenshot from 'Nightmare Temptation Academy'," 2012. [Online]. Available: https://www.lenanw.com/nightmaretemptationacademy. Accessed: May 7, 2021.

[204] R. Aniruth, "Lena NW's Nightmare Temptation Academy: Rap Battles & Subverting Dating Sim Tropes Through Active Consent - All Ages of Geek", *All Ages of Geek*, 2020. [Online]. Available: https://allagesofgeek.com/this-just-in/lena-nws-nightmare-temptation-academy-rap-battles-subverting-dating-sim-tropes-through-active-consent/. [Accessed: 27- Apr- 2022].

[205] A. Anthropy, "Screenshot of 'Dys4ia'," hosted on FreeGames.org, 2012. [Online]. Available: https://freegames.org/dys4ia/. Accessed: May 30, 2021.

[206] "Dys4ia — 21st Century Digital Art", *21st Century Digital Art*. [Online]. Available: http://www.digiart21.org/art/dys4ia. [Accessed: 27- Apr- 2022].

[207] "Queers in Love at the End of the World by anna anthropy", *itch.io*. [Online]. Available: https://w.itch.io/end-of-the-world. [Accessed: 27- Apr- 2022].

[208] "经济参考报删除《精神鸦片》原文，修改后重新发布/The Original Text of "Mental Opium" was Removed from the Economic Information Daily and Republished", *Gamelook.com.cn*, 2021. [Online]. Available: http://www.gamelook.com.cn/2021/08/449852 [Accessed: 14- Aug- 2021].

[209] L. Feng, "普通高校艺术教育二十年回顾与展望(1978—1998)/Twenty Years' Review and Prospect of Arts Education in General Colleges and Universities (1978-1998)", *People's Music*, vol. 1999, no. 10, pp. 33-37, 1999. Available: https://bar.cnki.net/bar/download/order?id=jBGETXBNdPImvx70aLAuJPYxPoFw%2bp%2bi0fliSrcN6lWK5eXoiKVxrLntGrnkJnbVl61dxzuriBMEhUg4v39I6PgDHl0ogwhLhF17SNSASrQtqddCdidyosdSaMNWur3ZJBjdlDrNnftoR5pdZPiFRNlKM4sfpT3nRHSqBOA4sms8GQBtE8Z8mK%2fNwS15YoSE8%2bm4HQrDW3H2xPCeyWWrRQ%3d%3d. [Accessed 22 March 2022].

[210] Q. Zhou and X. Hu, "走向美育的完整/Towards the Integrity of Aesthetic Education", *Educational Research*, vol. 2006, no. 3, pp. 41-45, 2006. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2006&filename=JYYJ20

0603004&uniplatform=NZKPT&v=ZsZnL1lpbGW5HIl-gMya5WUYWPxc3ijJ8XJZgLj42WK7SCiIyl1BEVzGCzCyMmx6. [Accessed 22 March 2022].

[211] S. Shi, "中国美术教育的“移植性”与中国美术的现代性经验（1900-1949）/The "Transplantation" of Chinese Art Education and the Experience of Modernity in Chinese Art (1900-1949) ", *Journal of Nanjing Arts Institute(Fine Arts & Design)*, vol. 2014, no. 1, pp. 117-121,192, 2014. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2014&filename=NJYS201401025&uniplatform=NZKPT&v=tW2EJ4ZF_6Zdf0gRbTfqFXv8hSDTtQscKj6d2ucifM1lOlpLaLHpSGcdgAVc9p8B. [Accessed 22 March 2022].

[212] D. Wang, "论电子游戏艺术的定义/The Definition of Video Game Art ", *Journal of Southwest Minzu University(Humanities and Social Science)*, vol. 2005, no. 12, pp. 362-365, 2005. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2005&filename=XNZS200512096&uniplatform=NZKPT&v=l6eA2ILsfFybLVh8g__nCLbyEVXSJiDbhamjagzj8Ua3_r8on5zUWCgjxxwUtb7P. [Accessed 22 March 2022].

[213] Z. Ren, H. Fu, Z. Huang, X. Zhang and A. Chen, "高中文理科学生数学水平比较研究/A Comparative Study of Mathematics Standards of Senior Secondary School Students in Arts and Science Subjects ", *Curriculum,Teaching Material and Method*, vol. 35, no. 6, pp. 62-67,121, 2015. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2015&filename=KJJF201506012&uniplatform=NZKPT&v=FCV5Ks19mnXH2Ufb1QQAy8v_OWQPr4f-h02rebbkofrWk7wMRq4D1BXjK5PeiTWm. [Accessed 22 March 2022].

[214] “Fluxus,” Britannica Concise Encyclopedia. 2017.

[215] F. M. Montagnino, “Joseph Beuys’ Rediscovery of Man–Nature Relationship: A Pioneering Experience of Open Social Innovation,” *Journal of open innovation*, vol. 4, no. 4, p. 50, 2018, doi: 10.3390/joitmc4040050.

[216] J. Beuys and V. Harlan, *What Is Art?: Conversation with Joseph Beuys* . Clairview Books; Illustrated edition, 2007.

[217] C. Foote, “Moma | Yoko Ono’s Secret piece,” Yoko Ono’s Secret Piece, INSIDE/OUT, https://www.moma.org/explore/inside_out/2014/04/30/yoko-onos-secret-piece/ [Accessed: 27- Aug- 2023].

[218] J. Persse, “From a whisper to a scream: Following Yoko Ono’s instructions,” INSIDE/OUT, https://www.moma.org/explore/inside_out/2010/07/14/from-a-whisper-to-a-scream-following-yoko-onos-instructions/ [Accessed: 27- Aug- 2023].

[219] “About / arte útil,” Arte til Arte til Comments, https://www.arte-util.org/about/colophon/ [Accessed: 27- Aug- 2023].

[220] M. Slater, B. Spanlang, M. Sanchez-Vives and O. Blanke, "First Person Experience of Body Transfer in Virtual Reality", *PloS one*, vol. 5, no. 5, pp. e10564-e10564, 2010. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2868878/. [Accessed 29 March 2022].

[221] M. Slater, "Immersion and the illusion of presence in virtual reality", *The British journal of psychology*, vol. 109, no. 3, pp. 431-433, 2018. Available: https://bpspsychub-onlinelibrary-wiley-com.gold.idm.oclc.org/doi/full/10.1111/bjop.12305. [Accessed 29 March 2022].

[222] M. Slater and D. Banakou, "The Golden Rule as a Paradigm for Fostering Prosocial Behavior With Virtual Reality", *Current Directions in Psychological Science*, vol. 30, no. 6, pp. 503-509, 2021. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/09637214211046954. [Accessed 31 March 2022].

[223] M. Slater and M. Sanchez-Vives, "Enhancing Our Lives with Immersive Virtual Reality", *Frontiers in robotics and AI*, vol. 3, 2016. Available: https://doi.org/10.3389/frobt.2016.00074. [Accessed 29 March 2022].

[224] X. Pan and d. Hamilton, "Why and how to use virtual reality to study human social interaction: The challenges of exploring a new research landscape", *British Journal of Psychology*, vol. 109, no. 3, pp. 395–417, 2018. Available: https://bpspsychub.onlinelibrary.wiley.com/doi/pdfdirect/10.1111/bjop.12290. [Accessed 29 March 2022].

[225] M. Slater, "Beyond Speculation About the Ethics of Virtual Reality: The Need for Empirical Results", *Frontiers in virtual reality*, vol. 12, 2021. Available: https://www.frontiersin.org/articles/10.3389/frvir.2021.687609/full#B21. [Accessed 31 March 2022].

[226] J. Blascovich, J. Loomis, A. Beall, K. Swinth, C. Hoyt and J. Bailenson, "TARGET ARTICLE: Immersive Virtual Environment Technology as a Methodological Tool for Social Psychology", *Psychological Inquiry*, vol. 12, no. 2, pp. 103-124, 2002. Available: https://www.tandfonline.com/doi/abs/10.1207/S15327965PLI1302_01. [Accessed 29 March 2022].

[227] M. Slater and M. Sanchez-Vives, "From presence to consciousness through virtual reality", *Nature reviews. Neuroscience*, vol. 6, no. 4, pp. 332-339, 2005. Available: https://web.s.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=0&sid=09cf40c7-f14a-4b1f-acaa-0de1fa43e9b0%40redis. [Accessed 29 March 2022].

[228] M. Slater, "Place illusion and plausibility can lead to realistic behaviour in immersive virtual environments", *Philosophical transactions. Biological sciences*, vol. 364, no. 1535, pp. 3549-3557, 2009. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2781884/. [Accessed 31 March 2022].

[229] M. Slater, B. Spanlang and D. Corominas, "Simulating virtual environments within virtual environments as the basis for a psychophysics of presence", *ACM transactions on graphics*, vol. 29, no. 4, pp. 1-9, 2010. Available: https://dl-acm-org.gold.idm.oclc.org/doi/10.1145/1778765.1778829. [Accessed 29 March 2022].

[230] J. Hvass, O. Larsen, K. Vendelbo, N. Nilsson, R. Nordahl and S. Serafin, "Visual realism and presence in a virtual reality game", in *2017 3DTV Conference: The True Vision - Capture, Transmission and Display of 3D Video (3DTV-CON)*, 2017, pp. 1-4.

[231] D. Shin, "How does immersion work in augmented reality games? A user-centric view of immersion and engagement", *Information, Communication & Society*, vol. 22, no. 9, pp. 1212-1229, 2017. Available: https://www-tandfonline-com.gold.idm.oclc.org/doi/full/10.1080/1369118X.2017.1411519. [Accessed 13 June 2022].

[232] M. Granato, D. Gadia, D. Maggiorini and L. Ripamonti, "An empirical study of players' emotions in VR racing games based on a dataset of physiological data", *Multimedia Tools and Applications*, vol. 79, pp. 33657–33686, 2020. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s11042-019-08585-y. [Accessed 13 June 2022].

[233] Z. Bai, N. Yao, N. Mishra, H. Chen, H. Wang and N. Magnenat Thalmann, "Enhancing Emotional Experience by Building Emotional Virtual Characters in VR Volleyball Games", *Computer animation and virtual worlds*, vol. 34, no. 3-4, 2021. Available: https://onlinelibrary-wiley-com.gold.idm.oclc.org/doi/full/10.1002/cav.2008. [Accessed 13 June 2022].

[234] A. Drummond, J. Sauer, C. Ferguson, P. Cannon and L. Hall, "Violent and non-violent virtual reality video games: Influences on affect, aggressive cognition, and aggressive behavior. Two pre-registered experiments", *Journal of Experimental Social Psychology*, vol. 95, p. 04119, 2021. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0022103121000196. [Accessed 13 June 2022].

[235] E. Geslin et al., "Bernardo Autonomous Emotional Agents Increase Perception of VR Stimuli", *Network and communication technologies*, vol. 5, no. 1, pp. 11-25, 2020. Available: https://ccsenet.org/journal/index.php/nct/article/view/0/41763. [Accessed 13 June 2022].

[236] E. Weiner and D. Sanchez, "Cognitive ability in virtual reality: Validity evidence for VR game-based assessments", *nternational journal of selection and assessment*, vol. 28, no. 3, pp. 215-235, 2020. Available: https://onlinelibrary-wiley-com.gold.idm.oclc.org/doi/full/10.1111/ijsa.12295. [Accessed 13 June 2022].

[237] J. Cummings and J. Bailenson, "How Immersive Is Enough? A Meta-Analysis of the Effect of Immersive Technology on User Presence", *Media Psychology*, vol. 19, no. 2, pp. 272-309, 2015. Available: https://www.tandfonline.com/doi/full/10.1080/15213269.2015.1015740?src=recsys. [Accessed 30 March 2022].

[238] I. Bergstrom, S. Azevedo, P. Papiotis, N. Saldanha and M. Slater, "The Plausibility of a String Quartet Performance in Virtual Reality", *IEEE transactions on visualization and computer graphics*, vol. 23, no. 4, pp. 1352-1359, 2017. Available: https://ieeexplore-ieee-org.gold.idm.oclc.org/document/7835714. [Accessed 4 April 2022].

[239] N. Yee and J. Bailenson, "The Proteus Effect: The Effect of Transformed Self-Representation on Behavior", *Human communication research*, vol. 33, no. 3, pp. 271-290, 2007. Available: https://academic.oup.com/hcr/article/33/3/271/4210718. [Accessed 3 April 2022].

[240] L. Maister, M. Slater, M. Sanchez-Vives and M. Tsakiris, "Changing bodies changes minds: owning another body affects social cognition Author links open overlay panel", *Trends in cognitive sciences*, vol. 9, no. 1, pp. 6-12, 2014. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S1364661314002344. [Accessed 29 March 2022].

[241] V. Petkova and H. Ehrsson, "If I Were You: Perceptual Illusion of Body Swapping", *PloS one*, vol. 3, no. 12, pp. e3832-e3832, 2008. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2585011/. [Accessed 29 March 2022].

[242] M. Apps and M. Tsakiris, "The free-energy self: A predictive coding account of self-recognition", *Neuroscience & Biobehavioral Reviews*, vol. 41, pp. 85-97, 2014. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0149763413000420. [Accessed 29 March 2022].

[243] M. Botvinick and J. Cohen, "Rubber hands 'feel' touch that eyes see", *Nature (London)*, vol. 391, no. 6669, pp. 756-756, 1998. Available: https://www.nature.com/articles/35784.pdf. [Accessed 29 March 2022].

[244] M. Schaefer, H. Heinze and M. Rotte, "My third arm: Shifts in topography of the somatosensory homunculus predict feeling of an artificial supernumerary arm", *Human brain mapping*, vol. 30, no. 5, pp. 1413-1420, 2009. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6870946/. [Accessed 29 March 2022].

[245] M. Schaefer, H. Flor, H. Heinze and M. Rotte, "Morphing the body: Illusory feeling of an elongated arm affects somatosensory homunculus", *NeuroImage*, vol. 36, no. 3, pp. 700-705, 2007. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S1053811907002091. [Accessed 31 March 2022].

[246] K. Kilteni, J. Normand, M. Sanchez-Vives, M. Slater and M. Tsakiris, "Extending Body Space in Immersive Virtual Reality: A Very Long Arm Illusion", *PLoS One*, vol. 7, no. 7, pp. e40867-e40867, 2012. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3400672/. [Accessed 3 April 2022].

[247] W. Steptoe, A. Steed and M. Slater, "Human Tails: Ownership and Control of Extended Humanoid Avatars", *IEEE Transactions on Visualization and Computer Graphics*, vol. 19, no. 4, pp. 583-590, 2013. Available: https://ieeexplore.ieee.org/document/6479185/authors#authors. [Accessed 23 March 2022].

[248] P. Bourdin, I. Barberia, R. Oliva and M. Slater, "A Virtual Out-of-Body Experience Reduces Fear of Death", *PLoS One*, vol. 12, no. 1, 2017. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5221792/#pone.0169343.ref041. [Accessed 29 March 2022].

[249] H. Ehrsson, "The Experimental Induction of Out-of-Body Experiences", *Science New Series*, vol. 317, no. 5841, p. 1048, 2007. Available: https://www-jstor-org.gold.idm.oclc.org/stable/20037648?sid=primo&seq=1. [Accessed 30 March 2022].

[250] M. Tsakiris, "Looking for Myself: Current Multisensory Input Alters Self-Face Recognition", *PLoS One*, vol. 3, no. 12, p. e4040, 2008. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2603324/. [Accessed 29 March 2022].

[251] T. Peck, S. Seinfeld, S. Aglioti and M. Slater, "Putting yourself in the skin of a black avatar reduces implicit racial bias", *Consciousness and Cognition*, vol. 22, no. 3, pp. 779-787, 2013. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S1053810013000597. [Accessed 29 March 2022].

[252] A. Rivas, X. Navarro, D. Banakou, R. Oliva, V. Orvalho and M. Slater, "The Influence of Embodiment as a Cartoon Character on Public Speaking Anxiety", *Frontiers in virtual reality*, vol. 2, 2021. Available: https://www.frontiersin.org/articles/10.3389/frvir.2021.695673/full. [Accessed 31 March 2022].

[253] I. Barberia, R. Oliva, P. Bourdin and M. Slater, "Virtual mortality and near-death experience after a prolonged exposure in a shared virtual reality may lead to positive life-attitude changes", *PloS one*, vol. 13, no. 11, p. e0203358, 2018. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6218023/. [Accessed 3 April 2022].

[254] S. Ahn, J. Bostick, E. Ogle, K. Nowak and K. McGillicuddy, "Experiencing Nature: Embodying Animals in Immersive Virtual Environments Increases Inclusion of Nature in Self and Involvement With Nature", *Journal of Computer-Mediated Communication*, vol. 21, no. 6, pp. 399-419, 2016. Available: https://onlinelibrary-wiley-com.gold.idm.oclc.org/doi/full/10.1111/jcc4.12173. [Accessed 31 March 2022].

[255] L. Aymerich-Franch, S. Kishore and M. Slater, "When Your Robot Avatar Misbehaves You Are Likely to Apologize: An Exploration of Guilt During Robot Embodiment", *International Journal of Social Robotics*, vol. 12, no. 1, pp. 217–226, 2019. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s12369-019-00556-5. [Accessed 31 March 2022].

[256] H. Farmer, L. Maister and M. Tsakiris, "Change my body, change my mind: the effects of illusory ownership of an outgroup hand on implicit attitudes toward that outgroup", *Frontiers in psychology*, vol. 4, p. 1016, 2014. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3888940/. [Accessed 3 April 2022].

[257] D. Banakou, P. Hanumanthu and M. Slater, "Virtual Embodiment of White People in a Black Virtual Body Leads to a Sustained Reduction in Their Implicit Racial Bias", *Frontiers in human neuroscience*, vol. 10, pp. 601-601, 2016. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5126081/. [Accessed 3 April 2022].

[258] H. Farmer, A. Tajadura-Jiménez and M. Tsakiris, "Beyond the colour of my skin: how skin colour affects the sense of body-ownership", *Consciousness and Cognition*, vol. 21, no. 3, pp. 1242-1256, 2012. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S1053810012001262. [Accessed 29 March 2022].

[259] L. Maister, N. Sebanz, G. Knoblich and M. Tsakiris, "Experiencing ownership over a dark-skinned body reduces implicit racial bias", *Cognition*, vol. 128, no. 2, pp. 170-178, 2013. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0010027713000772. [Accessed 29 March 2022].

[260] D. Banakou, R. Groten and M. Slater, "Illusory ownership of a virtual child body causes overestimation of object sizes and implicit attitude changes", *Proceedings of the National Academy of Sciences - PNAS*, vol. 110, no. 31, pp. 12846–12851, 2013. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3732927/. [Accessed 29 March 2022].

[261] B. Hoort, A. Guterstam and H. Ehrsson, "Being Barbie: The Size of One's Own Body Determines the Perceived Size of the World", *PloS one*, vol. 6, no. 5, pp. e20195-e20195, 2011. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3102093/. [Accessed 3 April 2022].

[262] D. Levitt, "Five Theses on Virtual Reality and Sociality Understanding the implications of radically new experiences", *PUBLIC SEMINAR*, 2018. Available: https://publicseminar.org/2018/05/five-theses-on-virtual-reality-and-sociality/. [Accessed 19 April 2022].

[263] M. Slater, D. Perez-Marcos, H. Ehrsson and M. Sanchez-Vives, "Inducing Illusory Ownership of a Virtual Body", *Frontiers in neuroscience*, vol. 3, no. 2, pp. 214–220, 2009. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2751618/. [Accessed 29 March 2022].

[264] M. Tsakiris and P. Haggard, "The rubber hand illusion revisited: visuotactile integration and self-attribution", *Journal of experimental psychology*, vol. 31, no. 1, pp. 80-91, 2005. Available: https://web-s-ebscohost-com.gold.idm.oclc.org/ehost/detail/detail?vid=0&sid=49a55f48-3e18-4a56-b7cc-5cbaab19add2%40redis&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#AN=2005-01366-006&db=pdh. [Accessed 31 March 2022].

[265] S. Trepte and L. Reinecke, "Avatar creation and video game enjoyment: Effects of life-satisfaction game competitiveness and identification with the avatar", *Journal of Media Psychology: Theories Methods and Applications*, vol. 22, no. 4, pp. 171-184, 2010.

[266] A. Maselli and M. Slater, "The building blocks of the full body ownership illusion", *Frontiers in human neuroscience*, vol. 7, pp. 83-83, 2013. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3604638/. [Accessed 3 April 2022].

[267] M. Jeannerod, "The mechanism of self-recognition in humans", *Behavioural Brain Research*, vol. 142, no. 1-2, pp. 1-15, 2003. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0166432802003844. [Accessed 30 March 2022].

[268] M. Costantini and P. Haggard, "The rubber hand illusion: Sensitivity and reference frame for body ownership", *Consciousness and Cognition*, vol. 16, no. 2, pp. 229-240, 2007. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S1053810007000037. [Accessed 30 March 2022].

[269] B. Lenggenhage, M. Mouthon and O. Blanke, "Spatial aspects of bodily self-consciousness", *Consciousness and Cognition*, vol. 18, no. 1, pp. 110-117, 2009. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S1053810008001864. [Accessed 29 March 2022].

[270] G. Carruthers, "Types of body representation and the sense of embodiment", *Consciousness and Cognition*, vol. 17, no. 4, pp. 1302-1316, 2008. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S1053810008000123. [Accessed 29 March 2022].

[271] D. Banakou, S. Kishore and M. Slater, "Virtually Being Einstein Results in an Improvement in Cognitive Task Performance and a Decrease in Age Bias", *Frontiers in psychology*, vol. 9, pp. 917-917, 2018. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6004376/. [Accessed 31 March 2022].

[272] S. Osimo, R. Pizarro, B. Spanlang and M. Slater, "Conversations between self and self as Sigmund Freud—A virtual body ownership paradigm for self counselling", *Scientific reports*, vol. 5, no. 1, pp. 13899-13899, 2015. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4564809/. [Accessed 3 April 2022].

[273] J. L. Lugrin, M. Ertl, P. Krop, R. Klüpfel, S. Stierstorfer, B.Weisz, M. Rück, J. Schmitt, N. Schmidt, and M. Latoschik, "Any 'Body' There? Avatar Visibility Effects in a Virtual Reality Game," 2018 IEEE Conference on Virtual Reality and 3D User Interfaces (VR), Reutlingen, Germany, 2018, pp. 1-8.

[274] C. McCall, J. Blascovich, A. Young and S. Persky, "Proxemic behaviors as predictors of aggression towards Black (but not White) males in an immersive virtual environment", *Social*

influence, vol. 4, no. 2, pp. 138-154, 2022. Available: https://www.tandfonline.com/doi/full/10.1080/15534510802517418. [Accessed 3 April 2022].

[275] V. Gallese, C. Keysers and G. Rizzolatti, "A unifying view of the basis of social cognition Author links open overlay panel", *Trends in Cognitive Sciences*, vol. 9, no. 8, pp. 396-403, 2004. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S1364661304001846. [Accessed 3 April 2022].

[276] C. Keysers and V. Gazzola, "Expanding the mirror: vicarious activity for actions, emotions, and sensations", *Current opinion in neurobiology*, vol. 19, no. 6, pp. 666-671, 2009. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0959438809001433. [Accessed 3 April 2022].

[277] V. Gallese, "The roots of empathy: The shared manifold hypothesis and the neural basis of intersubjectivity", *Psychopathology*, vol. 36, no. 4, pp. 171-180, 2003. Available: https://www.proquest.com/docview/75708756?accountid=11149&parentSessionId=UeyLy9auZr6JiGEpHoKPnCGTnaLmV0p%2BE2WLIt1%2FoMc%3D&pq-origsite=primo. [Accessed 3 April 2022].

[278] L. Nakamura, "Feeling good about feeling bad: virtuous virtual reality and the automation of racial empathy", *Journal of Visual Culture*, vol. 19, no. 1, pp. 47-64, 2022. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/1470412920906259. [Accessed 31 March 2022].

[279] C. Bevan et al., "Behind the Curtain of the “Ultimate Empathy Machine": On the Composition of Virtual Reality Nonfiction Experiences", *CHI 2019 Paper*, pp. 1-12, 2019. Available: https://dl-acm-org.gold.idm.oclc.org/doi/epdf/10.1145/3290605.3300736. [Accessed 4 April 2022].

[280] R. Schlembach and N. Clewer, "‘Forced empathy’: Manipulation, trauma and affect in virtual reality film", *International Journal of Cultural Studies*, vol. 24, no. 5, pp. 827-843, 2021. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/13678779211007863. [Accessed 3 May 2022].

[281] S. Neyret et al., "An embodied perspective as a victim of sexual harassment in virtual reality reduces action conformity in a later Milgram Obedience scenario", *Scientific reports*, vol. 10, no. 1, pp. 6207-6207, 2020. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7148366/. [Accessed 31 March 2022].

[282] G. Bollmer, "Empathy machines", *Media International Australia*, vol. 165, no. 1, pp. 63-76, 2017. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/1329878X17726794. [Accessed 3 May 2022].

[283] L. Brenner, "The autistic mirror in the real: Autism in Lacan’s mirror stage", *Theory & Psychology*, vol. 31, no. 6, pp. 950-972, 2021. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/09593543211034569. [Accessed 21 April 2022].

[284] D. Sigler and C. Lypka, "Time/frame: Rewriting the Mirror Stage in Lacan's Anxiety Seminar", *English Studies in Canada*, vol. 45, no. 4, pp. 1-21, 2019. Available: https://www.proquest.com/docview/2618173700?accountid=11149&parentSessionId=VhJmEC4GHP466plWVCYxAseVAdg%2FvTGZPYrXQ6pPwLI%3D&pq-origsite=primo. [Accessed 21 April 2022].

[285] J. Lacan and A. Sheridan, *Ecrits : a selection.* London: Routledge, 2001.

[286] J. Butler, “The Body Politics of Julia Kristeva,” *Hypatia*, vol. 3, no. 3, pp. 104–118, 1988.

[287] A. A. Munich, “Jacqueline Rose, "Sexuality in the Field of Vision" (Book Review),” *The Minnesota Review*, vol. 34. Minnesota Review, Minneapolis, Minn, p. 143, 1990.

[288] J. Butler, “Gender Trouble,” https://selforganizedseminar.files.wordpress.com/, https://selforganizedseminar.files.wordpress.com/2011/07/butler-gender_trouble.pdf [Accessed: 27- Aug- 2023].

[289] L. Irigaray, “THIS SEX WHICH IS NO ONE ,” caringlabor.files.wordpress.com, https://caringlabor.files.wordpress.com/2010/11/irigaray-this-sex-which-is-not-one.pdf [Accessed: 27- Aug- 2023].

[290] H. Cixous, “The Laugh of the Medusa,” https://artandobjecthood.files.wordpress.com/, https://artandobjecthood.files.wordpress.com/2012/06/cixous_the_laugh_of_the_medusa.pdf [Accessed: 27- Aug- 2023].

[291] L. Mulvey, B. R. Anna and d. O. Annie van, "Feminist film studies 40 years after ‘Visual Pleasure and Narrative Cinema’, a triologue," *NECSUS ; European Journal of Media Studies,* vol. 4, *(1),* pp. 67-79, 2015. Available: https://gold.idm.oclc.org/login?url=https://www.proquest.com/scholarly-journals/feminist-film-studies-40-years-after-visual/docview/1931992172/se-2. DOI: https://doi.org/10.5117/NECSUS2015.1.MULV. [Accessed: 27- Aug- 2023].

[292] J. Fortunato, "The Gaze and The Spielberg Face: Steven Spielberg's Application of Lacan's Mirror Stage and Audience Response", *Visual Communication Quarterly*, vol. 21, no. 1, pp. 40-53, 2014. Available: https://www.tandfonline.com/doi/full/10.1080/15551393.2014.892788#. [Accessed 21 April 2022].

[293] R. Coleman, "Sociology and the Virtual: Interactive Mirrors, Representational Thinking and Intensive Power", *The Sociological Review*, vol. 61, no. 1, pp. 1-20, 2013. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1111/1467-954X.12002. [Accessed 21 April 2022].

[294] O. Mannion, "Reading Facebook Through Lacan", *New Zealand Sociology*, vol. 26, no. 1, pp. 143-154, 2011. Available: https://www.proquest.com/docview/874476800?accountid=11149&parentSessionId=cLY%2BAopU%2Bs0u6fS55dvIK4kNqYNO42aMDItQyE7FbXo%3D&pq-origsite=primo. [Accessed 21 April 2022].

[295] A. Gerber, "The Mirror Chiasm: Problematizing Embeddedness in Video Games Through Mirrors," in Virtual Interiorities, Book Two: The Myth of Total Virtuality, V. Vahdat, D. Gottwald, and G. Turner-Rahman, Eds. Carnegie Mellon University: ETC Press, 2022, pp. 43-59.

[296] A. Brudniy and A. Demilhanova, "Virtual Reality in a Context of the 'Mirror Stage",*International Journal of Advances in Psychology*, 6-9, 2012. Available: https://d1wqtxts1xzle7.cloudfront.net/90678907/IJAP009-libre.pdf?1662377734=&response-content-disposition=inline%3B+filename%3Dthe_Virtual_Reality_in_a_Context_of_the.pdf&Expires=1694207693&Signature=cDfupjkAe1BvN0wHtomR5onYYiu~fOU~JMCAUYsukwQ3V79zfPTUbwV4OxUplYOWUXrz3eAqavib~0RaOkh10j7xvrR3LDIQal6dXk8ZCKGHY-pjDuUtCmoSxeSRH8kLE5Kve4o-dmngNy9eAEiu~J~3GXNmtRwKU2mZ0HhgV1j0mxZY~7LSEuY19x58xpAifxJDq1omYg64wgwDEPz50XV19QGIlkcT5BR5UKxiq4tU7kaLmsU~bsDgl6ybBQbn9ku~swYe3tNSUagydsx2FCZfjK0AkmM0QiilCx1DZoNhU9lKIGx4EP9-7bB4clJK84j4pxwshyieHT-EyOl9uQ__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA. [Accessed 29 March 2023].

[297] K. E. Clark, "How do we talk about embodiment in virtual reality?," in *DiGRA Conference Publication Format.* [Online]. Available: https://digraa.org/wp-content/uploads/2023/01/2023-CAMERA-READY_Kate-Clark.pdf. [Accessed 29 March 2023].

[298] L. Procter, "A Mirror without a Tain: Personae, Avatars, and Selves in a Multi-User Virtual Environment", *M/C J*, vol. 17, no. 3, Jun. 2014.

[299] M. Thibault and M. Bujić, ""Mirror Dwellers": Social VR, Identity and Internet Culture," in *DiGRA Conference Publication Format.* [Online]. Available: https://trepo.tuni.fi/bitstream/handle/10024/145683/DiGRA_2022_paper_2471.pdf?sequence=1&isAllowed=y. [Accessed 29 March 2023].

[300] Y. Inoue and M. Kitazaki, "Virtual Mirror and Beyond: The Psychological Basis for Avatar Embodiment via a Mirror," *Journal of robotics and mechatronics*, vol. 33, no. 5, pp. 1004–1012, 2021, doi: 10.20965/jrm.2021.p1004.

[301] A. Ballas, "Film Theory after Copjec", *Canadian review of American studies*, vol. 51, no. 1, pp. 63-81, 2021. Available: https://muse-jhu-edu.gold.idm.oclc.org/article/782860. [Accessed 22 April 2022].

[302] P. Murphy, "Psychoanalysis and Film Theory Part 2: Reflections and Refutations", *Kritikos*, vol. 2, 2005. Available: https://intertheory.org/psychoanalysis2.htm. [Accessed 22 April 2022].

[303] J.-L. Baudry, “The Apparatus: Metapsychological Approaches to the Impression of Reality in Cinema ,” Psychoanalysis.pdf, file:///Users/hyj/Downloads/Psychoanalysis.pdf [Accessed: 27- Aug- 2023].

[304] N. Carroll, "FILM LANGUAGE: A Semiotics of the Cinema," *Film Comment,* vol. 10, *(6),* pp. 62-63,61, 1974. Available: https://gold.idm.oclc.org/login?url=https://www.proquest.com/scholarly-journals/film-language-semiotics-cinema/docview/210241051/se-2. [Accessed: 27- Aug- 2023].

[305] A. Cholodenko, *Speculations on the Animatic Automaton_The Illusion of Life 2: More Essays on Animation*. Sydney: Power Publications, 2007, pp. 486-528.

[306] J. Raessens, "Serious games from an apparatus perspective", in *Digital Material: Tracing New Media in Everyday Life and Technology*, M. Boomen, S. Lammes, A. Lehmann and M. Schäfer, Ed. Amsterdam University Press, 2009, pp. 21-34.

[307] D. Levitt, *The Animatic Apparatus: Animation, Vitality, and the Futures of the Image*, 1st ed. Lanham: John Hunt Publishing, 2018, pp. 1-91. Available: https://ebookcentral.proquest.com/lib/goldsmiths/reader.action?docID=5375896. [Accessed 3 Nov 2020].

[308] A. Cholodenko, "(The) Death (of) The Animator, or: The Felicity of Felix", *International journal of Baudrillard studies*, vol. 11, no. 1, pp. 1-28, 2014. Available: https://baudrillardstudies.ubishops.ca/the-death-of-the-animator-or-the-felicity-of-felix/#back1. [Accessed 29 April 2022].

[309] V. Sobchack, "Animation and automation, or, the incredible effortfulness of being", *Screen*, vol. 50, no. 4, pp. 375–391, 2009. Available: https://academic.oup.com/screen/article/50/4/375/1641634. [Accessed 29 April 2022].

[310] S. Zrzek, “THE SUBLIME OBJECT OF IDEOLOGY,” https://altexploit.files.wordpress.com/, https://altexploit.files.wordpress.com/2017/09/slavoj-zizek-the-sublime-object-of-ideology-second-edition-the-essential-zizek-2009.pdf [Accessed: 27- Aug- 2023].

[311] D. Gasparyan, "Mirror for the Other: Problem of the Self in Continental Philosophy (from Hegel to Lacan)", *Integrative Psychological and Behavioral Science*, vol. 48, no. 1, pp. 1-17, 2013. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s12124-013-9247-x. [Accessed 21 April 2022].

[312] S. Zhao, "The Digital Self: Through the Looking Glass of Telecopresent Others", *Symbolic interaction*, vol. 28, no. 3, pp. 387-405, 2005. Available: https://onlinelibrary-wiley-com.gold.idm.oclc.org/doi/full/10.1525/si.2005.28.3.387. [Accessed 6 April 2022].

[313] R. Guadagno, J. Blascovich, J. Bailenson and C. Mccall, "Virtual Humans and Persuasion: The Effects of Agency and Behavioral Realism", *Media Psychology*, vol. 10, no. 1, pp. 1-22, 2007. Available: https://www.tandfonline.com/doi/full/10.1080/15213260701300865. [Accessed 23 March 2022].

[314] K. Christos, M. Despina, B. Domna and C. Maria, "Social Conformity in Immersive Virtual Environments: The Impact of Agents' Gaze Behavior", *Frontiers in psychology*, vol. 11, pp. 2254-2254, 2020. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7506128/. [Accessed 23 March 2022].

[315] M. Gonzalez-Franco, M. Slater, M. Birney, D. Swapp, S. Haslam and S. Reicher, "Participant concerns for the Learner in a Virtual Reality replication of the Milgram obedience study", *PloS one*, vol. 13, no. 12, pp. e0209704-e0209704, 2018. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6312327/. [Accessed 31 March 2022].

[316] M. Paladino, M. Mazzurega and F. Pavani, "Synchronous Multisensory Stimulation Blurs Self-Other Boundaries", *Psychological Science*, vol. 21, no. 9, pp. 1202-1207, 2010. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/0956797610379234. [Accessed 29 March 2022].

[317] J. Gutsell and M. Inzlicht, "Empathy constrained: prejudice predicts reduced mental simulation of actions during observation of outgroups", *Journal of experimental social psychology*, vol. 46, no. 5, pp. 841-845, 2010. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0022103110000661. [Accessed 3 April 2022].

[318] S. Vanheule, "Lacan's Construction and Deconstruction of the Double-Mirror Device", *Frontiers in psychology*, vol. 2, no. 209, 2011. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3171787/#B17. [Accessed 21 April 2022].

[319] J. Van Looy, C. Courtois, M. De Vocht and L. De Marez, "Player identification in online games: Validation of a scale for measuring identification in mmogs", *Media Psychology*, vol. 15, no. 2, pp. 197-221, 2012.

[320] M. V. Birk, R. L. Mandryk and C. Atkins, "The motivational push of games: The interplay of intrinsic motivation and external rewards in games for training", *Proceedings of the 2016 Annual Symposium on Computer-Human Interaction in Play CHI PLAY'16*, pp. 291-303, 2016.

[321] H. Michael, L. Nicolas, C. Marcus and J. Lutz, "Perspective and agency during video gaming influences spatial presence experience and brain activation patterns", *Behavioral and brain functions*, vol. 8, no. 1, p. 34, 2012.
Available: https://doaj.org/article/1156914961b24be0a00ec505bd8be598. [Accessed 19 May 2021].

[322] A. Schleiner, "Does Lara Croft Wear Fake Polygons? Gender and Gender-Role Subversion in Computer Adventure Games", *Leonardo*, vol. 34, no. 3, pp. 221-226, 2001. Available: https://muse-jhu-edu.gold.idm.oclc.org/article/19696. [Accessed 19 April 2022].

[323] R. Martey and M. Consalvo, "Performing the Looking-Glass Self: Avatar Appearance and Group Identity in Second Life", *Popular communication*, vol. 9, no. 3, pp. 165-180, 2011. Available: https://www.tandfonline.com/doi/full/10.1080/15405702.2011.583830. [Accessed 5 April 2022].

[324] G. Gaylor and J. Joudrey, *VRChat*. VRChat Inc., 2014.

[325] M. Cambre and C. Lavrence, "How Else Would You Take a Photo? #SelfieAmbivalence", *Cultural Sociology*, vol. 13, no. 4, pp. 503-524, 2019. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/1749975519855502. [Accessed 25 April 2022].

[326] J. Katz and E. Crocker, "Selfies and Photo Messaging as Visual Conversation: Reports from the United States, United Kingdom and China", *International journal of communication*, vol. 9, pp. 1861-1872, 2015. Available: https://ijoc.org/index.php/ijoc/article/view/3180/1405. [Accessed 26 April 2022].

[327] C. Lavrence and C. Cambre, ""Do I Look Like My Selfie?": Filters and the Digital-Forensic Gaze", *Social Media + Society*, vol. 6, no. 4, 2020. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/2056305120955182#bibr37-2056305120955182. [Accessed 25 April 2022].

[328] A. Elias and R. Gill, "Beauty surveillance: The digital self-monitoring cultures of neoliberalism", *European Journal of Cultural Studies*, vol. 21, no. 1, pp. 59-77, 2018. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/1367549417705604. [Accessed 25 April 2022].

[329] A. Dhir, S. Pallesen, T. Torsheim and C. Andreassen, "Do age and gender differences exist in selfie-related behaviours?", *Computers in Human Behavior*, vol. 63, pp. 549-555, 2016. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0747563216303806#!. [Accessed 25 April 2022].

[330] R. Mihaila and L. Braniste, "Digital Semantics of Beauty Apps and Filters: Big Data-driven Facial Retouching, Aesthetic Self-Monitoring Devices, and Augmented Reality-based Body-Enhancing Technologies", *Journal of research in gender studies*, vol. 11, no. 2, pp. 100-112, 2021. Available: https://www.proquest.com/docview/2623611306?accountid=11149&parentSessionId=1zz%2Bxlt30Oo5mnHrl%2B0TiogX8MC92%2FOpHsn7KNs9StI%3D&parentSessionId=octFPK%2B8b9CBNcp0uZF8aHniyJM62Y%2BRgLE%2BS%2BybO%2F8%3D&pq-origsite=primo. [Accessed 25 April 2022].

[331] A. Khanna and M. Sharma, "Selfie use: The implications for psychopathology expression of body dysmorphic disorder", *Industrial psychiatry journal*, vol. 26, no. 1, pp. 106–109, 2017. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5810159/. [Accessed 26 April 2022].

[332] G. Frasca, *Ludologists love stories, too: notes from a debate that never took place*. Ludology.org, 2003.

[333] E. Aarseth, "A narrative theory of games", in *FDG '12: Proceedings of the International Conference on the Foundations of Digital Games*, 2012, pp. 129–133.

[334] S. Gallagher, "Philosophical conceptions of the self: implications for cognitive science", *Trends in Cognitive Sciences*, vol. 4, no. 1, pp. 14-21, 2000. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S1364661399014175. [Accessed 31 March 2022].

[335] J. Simons, "Narrative, Games, and Theory", *Game Studies*, no. 7, p. 1, 2007. Available: http://gamestudies.org/0701/articles/simons. [Accessed 28 March 2022].

[336] M. Perreault, G. Perreault, J. Jenkins and A. Morrison, "Depictions of Female Protagonists in Digital Games: A Narrative Analysis of 2013 DICE Award-Winning Digital Games", *Games and Culture*, vol. 13, no. 8, pp. 843-860, 2016. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/1555412016679584. [Accessed 28 March 2022].

[337] J. Arjoranta, "Narrative Tools for Games: Focalization, Granularity, and the Mode of Narration in Games", *Games and Culture*, vol. 12, no. 7-8, pp. 696-717, 2015. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/1555412015596271. [Accessed 28 March 2022].

[338] M. Buchanan-Oliver and Y. Seo, “Play as co-created narrative in computer game consumption: The hero's journey in Warcraft III,” *Journal of consumer behaviour,* vol. 11, no. 6, pp. 423–431, 2012, doi: 10.1002/cb.392.

[339] B. Koles and P. Nagy, "Digital object attachment", *Current Opinion in Psychology*, vol. 39, pp. 60-65, 2021. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S2352250X20301251. [Accessed 5 April 2022].

[340] K. Saito, "From Novels to Video Games: Romantic Love and Narrative Form in Japanese Visual Novels and Romance Adventure Games", *Arts*, vol. 10, no. 3, 2021. Available: https://www-proquest-com.gold.idm.oclc.org/docview/2576378503?accountid=11149&pq-origsite=primo. [Accessed 28 March 2022].

[341] H. Backe and J. Thon, "Playing with Identity Authors, Narrators, Avatars, and Players in The Stanley Parable and The Beginner's Guide", *Diegesis (Wuppertal)*, vol. 8, no. 2, 2019. Available: https://doaj.org/article/a481b4660247420b8b2dadfd7d96decf. [Accessed 24 March 2022].

[342] C. Roe and A. Mitchell, ""IS THIS REALLY HAPPENING?": GAME MECHANICS AS UNRELIABLE NARRATOR", in *DiGRA '19 - Proceedings of the 2019 DiGRA International Conference: Game, Play and the Emerging Ludo-Mix*, 2019.

[343] A. Cote, "Writing “Gamers”: The Gendered Construction of Gamer Identity in Nintendo Power (1994–1999)", *Games and Culture*, vol. 13, no. 5, pp. 479-503, 2015. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/1555412015624742. [Accessed 28 March 2022].

[344] D. Williams, N. Martins and M. Consalvo, "The virtual census: representations of gender, race and age in video games", *New Media & Society*, vol. 11, no. 5, pp. 815-834, 2019. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/abs/10.1177/1461444809105354. [Accessed 28 March 2022].

[345] H. Kennedy, "Lara Croft: Feminist Icon or Cyberbimbo? On the Limits of Textual Analysis", *Game Studies*, vol. 2, no. 2, 2002. Available: http://www.gamestudies.org/0202/kennedy/. [Accessed 28 March 2022].

[346] M. Perreault, G. Perreault and A. Suarez, "What Does it Mean to be a Female Character in “Indie” Game Storytelling? Narrative Framing and Humanization in Independently Developed Video Games", *Games and Culture*, vol. 17, no. 2, pp. 244-261, 2021. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/15554120211026279. [Accessed 28 March 2022].

[347] S. Barlow, *Her Story*. Sam Barlow, 2015.

[348] "Never Alone (Kisima Ingitchuna)", *gamesforchange.* [Online]. Available: https://www.gamesforchange.org/games/never-alone-kisima-ingitchuna/ . [Accessed: 19- Apr- 2023].

[349] J. Blow, *Braid*. Number None, 2008.

[350] *SKYHILL*. Mandragora, 2015.

[351] D. Wreden and W. Pugh, *The Stanley Parable*. Galactic Cafe, 2013.

[352] D. Wreden, *The Beginner's Guide*. Everything Unlimited Ltd., 2015.

[353] A. F. Meades, “Playing against the grain: rhetorics of counterplay in console based first-person shooter videogames,” Brunel University London, 2013.

[354] A. Schleiner, "Velvet-Strike: War Times and Reality Games", *Opensorcery.net*, 2002. [Online]. Available: http://opensorcery.net/aboutvs.html. [Accessed: 19- Apr- 2022].

[355] "Velvet-Strike", [Online]. Available: http://www.opensorcery.net/velvet-strike/about.html. [Accessed: 19- Apr- 2022].

[356] "O.U.T.", *Opensorcery.net*, 2004. [Online]. Available: http://www.opensorcery.net/OUT/. [Accessed: 19- Apr- 2022].

[357] "Online Games and Counterplay", *Search-credoreference-com.gold.idm.oclc.org*. [Online]. Available: https://search-credoreference-com.gold.idm.oclc.org/content/entry/wileydcas/online_games_and_counterplay/0. [Accessed: 19- Apr- 2022].

[358] "Feminist Frequency", *Feminist Frequency*. [Online]. Available: https://feministfrequency.com/. [Accessed: 19- Apr- 2022].

[359] M. Amorim, B. Trumbore and P. Chogyen, “Cognitive Repositioning inside a Desktop VE: The Constraints Introduced by First-versus Third-Person Imagery and Mental Representation Richness”, *Presence: Teleoperators and Virtual Environments*, vol. 9, no. 2, pp. 165–186, 2000. Available: https://direct-mit-edu.gold.idm.oclc.org/pvar/article/9/2/165/18282/Cognitive-Repositioning-inside-a-Desktop-VE-The. [Accessed 19 May 2021].

[360] J. Whitson, "Rule Making and Rule Breaking: Game Development and the Governance of Emergent Behaviour", *The Fibreculture Journal*, no. 16, 2010. Available: https://sixteen.fibreculturejournal.org/rule-making-and-rule-breaking-game-development-and-the-governance-of-emergent-behaviour/. [Accessed 19 April 2022].

[361] "Exhibition: #Chicken# Loading@PUBG", *Gene-gallery.com*. [Online]. Available: http://www.gene-gallery.com/webapp/exhibitionInfo?page=exhibition-info&Language=en_US&exId=40. [Accessed: 19- Apr- 2022].

[362] G. Martin, “Heterotopias | games + architecture”, *Heterotopias*. [Online]. Available: https://www.heterotopiaszine.com/. [Accessed: 14- May- 2021].

[363] M. Rogowska-Stangret, “Situated Knowledges,” New Materialism, https://newmaterialism.eu/almanac/s/situated-knowledges.html (accessed Nov. 2, 2023).

[364] L. Chiapello, “Experience, Rationality, Situation and Fallibilism: Establishing a Feminist Pragmatist Epistemology in Game Studies,” *Games and culture*, 2023, doi: 10.1177/15554120231186265.

[365] L. Wildt, T. Apperley and J. Clemens, "(Re-)Orienting the Video Game Avatar", *Games and Culture*, vol. 15, no. 8, pp. 962-981, 2019. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/1555412019858890. [Accessed 23 March 2022].

[366] J. Banks and N. Bowman, "Some Assembly Required: Player Mental Models of Videogame Avatars", *Frontiers in psychology*, vol. 12, no. 701965, 2021. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8319498/#fn0001. [Accessed 23 March 2022].

[367] J. Bailenson, J. Blascovich and A. Beall, "Interpersonal Distance in Immersive Virtual Environments", *Personality and Social Psychology Bulletin*, vol. 29, no. 7, pp. 819-833, 2003. Available: https://journals.sagepub.com/doi/abs/10.1177/0146167203029007002. [Accessed 23 March 2022].

[368] S. Lim and B. Reeves, "Computer agents versus avatars: Responses to interactive game characters controlled by a computer or other player", *International Journal of Human-Computer Studies*, vol. 68, no. 1-2, pp. 57-68, 2010. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S107158190900130X#!. [Accessed 23 March 2022].

[369] A. Pütten, N. Krämer, J. Gratch and S. Kang, ""It doesn't matter what you are!" Explaining social effects of agents and avatars", *Computers in Human Behavior*, vol. 26, no. 6, pp. 1641-1650, 2010. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0747563210001846#!. [Accessed 23 March 2022].

[370] A. Felnhofer, J. Kafka, H. Hlavacs, L. Beutl, I. Exner and O. Kothgassner, "Meeting others virtually in a day-to-day setting: Investigating social avoidance and prosocial behavior towards avatars and agents Author links open overlay panel", *Computers in Human Behavior*, vol. 80, pp. 399-406, 2018. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0747563217306696. [Accessed 23 March 2022].

[371] I. Eiko, "Visualizing the Networked Self: Agency, Reflexivity, and the Social Life of Avatars", *Social Research*, vol. 78, no. 4, pp. 1155-1184, 2011. Available: https://www.proquest.com/docview/1010360723?accountid=11149&parentSessionId=0RYj21OElViLIiWkSXfzrJU%2BaTZq6UEVmFUg3TpoIsM%3D&pq-origsite=primo. [Accessed 23 March 2022].

[372] N. Bowman and J. Banks, *Player-Avatar Identification, Relationships, and Interaction: Entertainment Through Asocial, Parasocial, and Fully Social Processes*. 2021.

[373] J. Banks and N. Bowman, "FROM TOY AND TOOL TO PARTNER AND PERSON: PHENOMENAL CONVERGENCE/DIVERGENCE AMONG GAME AVATAR METAPHORS", *AoIR Selected Papers of Internet Research*, no. 16, pp. 21-24, 2015. Available: https://journals.uic.edu/ojs/index.php/spir/article/view/8621. [Accessed 23 March 2022].

[374] D. Ko and J. Park, "I am you, you are me: game character congruence with the ideal self", *Internet research*, vol. 31, no. 2, pp. 613-634, 2021. Available: https://www.proquest.com/docview/2533918897?OpenUrlRefId=info:xri/sid:primo&accountid=11149. [Accessed 5 April 2022].

[375] T. Lynch, J. Tompkins, I. Driel and N. Fritz, "Sexy, strong, and secondary: A content analysis of female characters in video games across 31 years", *Journal of Communication*, vol. 66, no. 4, pp. 564–584, 2016. Available: https://academic.oup.com/joc/article/66/4/564/4082387. [Accessed 6 April 2022].

[376] J. Jansz and R. Martis, "The Lara phenomenon: Powerful female characters in video games", *Sex Roles*, vol. 56, no. 3, pp. 141-148, 2007. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s11199-006-9158-0. [Accessed 6 April 2022].

[377] M. Miller and A. Summers, "Gender Differences in Video Game Characters' Roles, Appearances, and Attire as Portrayed in Video Game Magazines", *Sex Roles*, vol. 57, no. 9, pp. 733–742, 2007. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s11199-007-9307-0. [Accessed 6 April 2022].

[378] B. Beasley and T. Standley, "Shirts vs. Skins: Clothing as an Indicator of Gender Role Stereotyping in Video Games", *Mass Communication and Society*, vol. 5, no. 3, pp. 279-293, 2002. Available: https://www-tandfonline-com.gold.idm.oclc.org/doi/abs/10.1207/S15327825MCS0503_3. [Accessed 6 April 2022].

[379] T. Dietz, "An examination of violence and gender role portrayals in video games: Implications for gender socialization and aggressive behavior", *Sex Roles*, vol. 38, no. 5, pp. 425-442, 1998. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1023/A%3A1018709905920. [Accessed 6 April 2022].

[380] E. Behm-Morawitz and D. Mastro, "The effects of the sexualization of female video game characters on gender stereotyping and female self-concept", *Sex Roles*, vol. 61, no. 11-12, pp. 808–823, 2009. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s11199-009-9683-8. [Accessed 6 April 2022].

[381] K. Dill, B. Brown and M. Collins, "Effects of exposure to sex-stereotyped video game characters on tolerance of sexual harassment.", *Journal of Experimental Social Psychology*, vol. 44, no. 5, pp. 1402-1408, 2008. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0022103108001005. [Accessed 6 April 2022].

[382] M. MIKULA, "Gender and videogames: The political valency of Lara Croft.", *Continuum: Journal of Media & Cultural Studies*, vol. 1, no. 1, pp. 79-87, 2003. Available: https://www.tandfonline.com/doi/abs/10.1080/1030431022000049038. [Accessed 6 April 2022].

[383] J. Fox, J. Bailenson and L. Tricase, "The embodiment of sexualized virtual selves: The Proteus effect and experiences of self-objectification via avatars", *Computers in Human Behavior*, vol. 29, no. 3, pp. 930-938, 2013. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S074756321200369X. [Accessed 6 April 2022].

[384] J. Fox, R. Ralston and C. Cooper, "Sexualized Avatars Lead to Women's Self-Objectification and Acceptance of Rape Myths", *Psychology of Women Quarterly*, vol. 39, no. 3, pp. 349-362, 2014. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/0361684314553578. [Accessed 6 April 2022].

[385] G. Read, T. Lynch and N. Matthews, "Increased Cognitive Load during Video Game Play Reduces Rape Myth Acceptance and Hostile Sexism after Exposure to Sexualized Female Avatars", *Sex roles*, vol. 79, no. 11-12, pp. 683–698, 2018. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s11199-018-0905-9. [Accessed 6 April 2022].

[386] N. Yee, J. Bailenson and N. Ducheneaut, "The Proteus Effect: Implications of Transformed Digital Self-Representation on Online and Offline Behavior", *Communication Research*, vol. 36, no. 2, pp. 285-312, 2009. Available: https://journals.sagepub.com/doi/10.1177/0093650208330254. [Accessed 6 April 2022].

[387] L. Vandenbosch, K. Driesmans, J. Trekels and S. Eggermont, "Sexualized video game avatars and self-objectification in adolescents: The role of gender congruency and activation frequency", *Media psychology*, vol. 20, no. 2, pp. 221-239, 2017. Available: https://www.tandfonline.com/doi/full/10.1080/15213269.2016.1142380. [Accessed 6 April 2022].

[388] J. Fox and J. Bailenson, "Virtual Self-Modeling: The Effects of Vicarious Reinforcement and Identification on Exercise Behaviors", *Media psychology*, vol. 12, no. 1, pp. 1-25, 2009. Available: https://www.tandfonline.com/doi/full/10.1080/15213260802669474. [Accessed 6 April 2022].

[389] N. Matthews, T. Lynch and N. Martins, "Real ideal: Investigating how ideal and hyper-ideal video game bodies affect men and women.", *Computers in Human Behavior*, vol. 59, pp. 155-164, 2016. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0747563216300346. [Accessed 6 April 2022].

[390] J. Fox and J. Bailenson, "Virtual Virgins and Vamps: The Effects of Exposure to Female Characters' Sexualized Appearance and Gaze in an Immersive Virtual Environment", *Sex Roles*, vol. 61, no. 3-4, pp. 147-157, 2009. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s11199-009-9599-3. [Accessed 6 April 2022].

[391] R. Martey, J. Stromer-Galley, J. Banks, J. Wu and M. Consalvo, "The strategic female: gender-switching and player behavior in online games", *Information, communication & society*, vol. 17, no. 3, pp. 286-300, 2014. Available: https://www.tandfonline.com/doi/full/10.1080/1369118X.2013.874493. [Accessed 6 April 2022].

[392] H. Mills, "Avatar Creation: The Social Construction of "Beauty" in Second Life", *Journalism & Mass Communication Quarterly*, vol. 95, no. 3, pp. 607-624, 2018. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/1077699017722105. [Accessed 6 April 2022].

[393] M. Zhang, "A Chinese beauty story: how college women in China negotiate beauty, body image, and mass media", *Chinese Journal of Communication*, vol. 5, no. 4, pp. 437-454, 2012. Available: https://www.tandfonline.com/doi/full/10.1080/17544750.2012.723387. [Accessed 4 May 2022].

[394] K. Karan and Y. Feng, "The Emerging Hybrid Images of Women in China: The Portrayal of the New Woman in Chinese Local and International Magazine Advertising", *Advertising & Society Review*, vol. 11, no. 1, 2010. Available: https://muse-jhu-edu.gold.idm.oclc.org/article/377517. [Accessed 7 April 2022].

[395] Y. Luo and X. Hao, "Media Portrayal of Women and Social Change A case study of Women of China", *Feminist Media Studies*, vol. 7, no. 3, pp. 281-298, 2022. Available: https://www.tandfonline.com/doi/full/10.1080/14680770701477891. [Accessed 7 April 2022].

[396] H. Wu and R. Guan, "Transmutation of Women Image in Chinese Cinema for a Century/论我国百年电影女性形象的嬗变", *Movie Literature*, vol. 21, pp. 19-20, 2007. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2007&filename=DYLX200721009&uniplatform=NZKPT&v=ix_oxC-XtlUsS9pYCQ5dp9VAiDgFnI3GdOj5wBLoU6C6GdPwkJMKYrHXAzhE1tI5. [Accessed 7 April 2022].

[397] Z. Li and H. Chen, "谁决定了时代美女? ——关于百年中国女性形象之变迁/Who Determines the Beauty of the Times? --On the Changing Image of Chinese Women in the Past 100 Years", *Chinese Culture Research*, vol. 3, pp. 131-137,3, 2001. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2001&filename=ZWHY200103023&uniplatform=NZKPT&v=e_d0IkLIqFJmh8ayHJkcQBExG70cVJbUaEq8iASsfs27BNqe7Kc-gZVEIk5pharA. [Accessed 7 April 2022].

[398] B. Huang, "百年中国电影中的女性形象/Reflections on the Woman Images in Chinese Movies Produced", *Journal of Hunan Mass Media Vocational and Technical College*, vol. 4, no. 1, pp. 74-77, 2004. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2004&filename=DZCM200401019&uniplatform=NZKPT&v=YiVs2_I18AD8bojVi5SWKH36LAnQZSdN_5AVNFtsF49Wz3MApYb1TlJrHsOxEWDf. [Accessed 7 April 2022].

[399] Y. Lu, "中国电视传播中的女性形象研究/A Study of the Women Image in Chinese Television", *Journalism Research*, vol. 1, pp. 32-36, 40, 1997. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD9697&filename=XWDX199701008&uniplatform=NZKPT&v=4xVL8HgKcxdZCIFdIKNNw5uuMF9j-0G8MEf17CQZQaXgVm65iDTWVboRjZsLPB7O. [Accessed 7 April 2022].

[400] Y. Chen, "当代中国影视中的女性形象之嬗变/The Transformation of the Image of Women in Contemporary Chinese Film and Television", *Nankai Journal (Philosophy,Literature and Social Science Edition)*, vol. 4, pp. 14-21, 2007. Available:

https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2007&filename=LKXB200704005&uniplatform=NZKPT&v=bjjd5cwu1KxatHdXG9CF3Ya8aTYs6MDWYyAEcqOM4O8tsKr5BwhyM3NsSanZSuxG. [Accessed 7 April 2022].

[401] L. Wang, "从‘女劳模’到‘女明星’——从《中国妇女》60 年封面人物看国家意识形态控制下媒体女性形象变迁及国家话语转变/“From ‘Female Model Worker’ to ’Female Star’-Investagatiob in 60 Years' Cover of ‘Chinese Women’ about the Changing of Portrayal of Women in the Media under State Ideological Control and the Transformation of State Discourse", *Shanghai Journalism Review*, vol. 12, pp. 87-92, 2011. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2011&filename=XWJZ201112031&uniplatform=NZKPT&v=3iiRMqq9e75S-brKTYbPD-rBVD7edMzkcg4xq9DP3OPdYJB4R-bVNmMsCtXYNxPC. [Accessed 7 April 2022].

[402] L. Xiao and F. Wang, "Examining the Links Between Beauty Ideals Internalization, the Objectification of Women, and Ambivalent Sexism Among Chinese Women: The Effects of Sexual Orientation", *Archives of Sexual Behavior volume*, vol. 50, no. 2, pp. 553-562, 2020. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s10508-020-01718-7. [Accessed 6 May 2022].

[403] S. Samizadeh, W. Wu "The Ideals of Facial Beauty Among Chinese Aesthetic Practitioners: Results from a Large National Survey", *Aesthetic plastic surgery*, vol. 43, no. 1, pp. 102-114, 2018. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s00266-018-1241-8. [Accessed 6 May 2022].

[404] W. Wang, X. Zheng, X. Yue and N. Zhong, "The role of beauty as currency belief in acceptance of cosmetic surgery and career aspirations among Chinese young women", *The Journal of social psychology*, vol. 161, no. 3, pp. 351-362, 2021. Available: https://www.tandfonline.com/doi/full/10.1080/00224545.2020.1842314. [Accessed 6 May 2022].

[405] D. Wang and M. Fan, "网络游戏中的女性形象探析/An Exploration of the Portrayal of Women in Online Games", *Journal of Central South University (Social Sciences)*, vol. 12, no. 2, pp. 247-250, 254, 2006. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2006&filename=ZLXS200602019&uniplatform=NZKPT&v=ehXzZF3eDlgiyWPi5HwdzzC9nz2hqxbPj4qnnpo4SN-y5EiZ8nJ9b9KGlLpiicvk. [Accessed 7 April 2022].

[406] Y. Yang, "浅析 MMORPG 游戏中的女性角色的形象特征/An Analysis of the Characterisation of Female Characters in MMORPGs", *Science & Technology Information*, vol. 20, pp. 723-724, 2009. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2009&filename=KJXX200920632&uniplatform=NZKPT&v=sjtKQEz-IherdFISidf-S5AJzpk2jb5UOUaaLy7EmerI7D8wrtTuG-2KgOWovD4e. [Accessed 7 April 2022].

[407] Y. Huan, "Proceedings of the 2021 International Conference on Education, Language and Art (ICELA 2021)", *Atlantis Press: Advances in Social Science, Education and Humanities Research*, 2022. Available: https://www.atlantis-press.com/proceedings/icela-21/125969922. [Accessed 7 April 2022].

[408] P. Nagy and B. Koles, ""My Avatar and Her Beloved Possession": Characteristics of Attachment to Virtual Objects", *Psychology & marketing*, vol. 31, no. 12, pp. 1122-1135, 2014. Available: https://onlinelibrary-wiley-com.gold.idm.oclc.org/doi/full/10.1002/mar.20759. [Accessed 19 April 2022].

[409] S. Buran, "CORRESPONDENCE BETWEEN CYBORG BODY AND CYBER SELF", *Journal of Research in Gender Studies*, vol. 5, no. 2, pp. 290-322, 2015. Available: https://www.proquest.com/docview/1754528138?accountid=11149&parentSessionId=xf8PmEF%2FwMUfS9MXPDRjwSmGANjM%2FcAJibwwQ8YWLIU%3D&pq-origsite=primo. [Accessed 19 April 2022].

[410] E. Huff, B. Stigall, J. Brinkley, R. Pak and K. Caine, "Can Computer-Generated Speech Have an Age?", *CHI EA '20: Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*, pp. 1-7, 2020. Available: https://dl.acm.org/doi/fullHtml/10.1145/3334480.3383082. [Accessed 3 May 2022].

[411] E. Lee, C. Nass and S. Brave, "Can computer-generated speech have gender?: an experimental test of gender stereotype", *CHI EA '00: CHI '00 Extended Abstracts on Human Factors in Computing Systems*, pp. 289–290, 2000. Available: https://dl.acm.org/doi/10.1145/633292.633461. [Accessed 3 May 2022].

[412] C. Nass and K. Lee, "Does Computer-Synthesized Speech Manifest Personality? Experimental Tests of Recognition, Similarity-Attraction, and Consistency-Attraction", *Journal of experimental psychology*, vol. 7, no. 3, pp. 171-181, 2001. Available: https://web.p.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=0&sid=c9cc31ea-28ed-46c1-b99c-9c2ba345842e%40redis. [Accessed 3 May 2022].

[413] E. Karuzaki et al., "Realistic Virtual Humans for Cultural Heritage Applications", *Heritage*, vol. 4, no. 228, pp. 4148-4171, 2021. Available: https://www.mdpi.com/2571-9408/4/4/228/htm. [Accessed 5 May 2022].

[414] S. Heidig and G. Clarebout, "Do pedagogical agents make a difference to student motivation and learning?", *Educational research review*, vol. 6, no. 1, pp. 27-54, 2011. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S1747938X10000424. [Accessed 3 May 2022].

[415] D. Parmar, S. Olafsson, D. Utami, P. Murali and T. Bickmore, "Designing empathic virtual agents: manipulating animation, voice, rendering, and empathy to create persuasive

agents", *Autonomous Agents and Multi-Agent Systems*, vol. 36, no. 1, 2022. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s10458-021-09539-1. [Accessed 3 May 2022].

[416] S. Craig and N. Schroeder, "Reconsidering the voice effect when learning from a virtual human", *Computers and education*, vol. 114, pp. 193-205, 2017. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0360131517301653. [Accessed 3 May 2022].

[417] A. Borst and B. Gelder, "Is it the real deal? Perception of virtual characters versus humans: an affective cognitive neuroscience perspective", *Front Psychol*, vol. 6, p. 576, 2015. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4428060/. [Accessed 9 May 2022].

[418] L. Gong and C. Nass, "When a Talking-Face Computer Agent is Half-Human and Half-Humanoid: Human Identity and Consistency Preference", *Human Communication Research*, vol. 33, no. 2, pp. 163–193, 2007. Available: https://academic.oup.com/hcr/article/33/2/163/4210759. [Accessed 4 May 2022].

[419] A. Elkins, G. Douglas C Kolfschoten and B. Reinig, "The Sound of Trust: Voice as a Measurement of Trust During Interactions with Embodied Conversational Agents", *Group decision and negotiation*, vol. 22, no. 5, pp. 897-913, 2013. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s10726-012-9339-x. [Accessed 3 May 2022].

[420] G. Lucas, J. Gratch, A. King and L. Morency, "It's only a computer: Virtual humans increase willingness to disclose", *Computers in human behavior*, vol. 37, pp. 94-100, 2014. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0747563214002647. [Accessed 9 May 2022].

[421] T. Burleigh, J. Schoenherr and G. Lacroix, "Does the uncanny valley exist? An empirical test of the relationship between eeriness and the human likeness of digitally created faces", *Computers in human behavior*, vol. 29, no. 3, pp. 759-771, 2013. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0747563212003263. [Accessed 9 May 2022].

[422] M. Mori, K. MacDorman and N. Kageki, "The Uncanny Valley [From the Field]", *IEEE robotics & automation magazine*, vol. 19, no. 2, pp. 98-100, 2012. Available: https://ieeexplore-ieee-org.gold.idm.oclc.org/document/6213238/authors#authors. [Accessed 9 May 2022].

[423] Y. YAMADA, T. KAWABE and K. IHAYA, "Categorization difficulty is associated with negative evaluation in the "uncanny valley" phenomenon", *Japanese Psychological Research*, vol. 55, no. 1, pp. 20-32, 2013. Available:https://web.s.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=0&sid=48fa92fe-6a83-4157-9897-78eec7ea73fe%40redis. [Accessed 10 May 2022].

[424] W. Mitchell, K. Szerszen, A. Lu, P. Schermerhorn, M. Scheutz and K. MacDorman, "A mismatch in the human realism of face and voice produces an uncanny valley", *i-Perception*

(London), vol. 2, no. 1, pp. 10-12, 2011. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3485769/. [Accessed 3 May 2022].

[425] K. MacDorman and D. Chattopadhyay, "Reducing consistency in human realism increases the uncanny valley effect; increasing category uncertainty does not Author links open overlay panel", *Cognition*, vol. 146, pp. 190-205, 2016. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0010027715300755. [Accessed 10 May 2022].

[426] K. MacDorman, R. Green, C. Ho and C. Koch, "Too real for comfort? Uncanny responses to computer generated faces", *Computers in human behavior*, vol. 25, no. 3, pp. 695-710, 2009. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0747563208002379. [Accessed 9 May 2022].

[427] R. McDonnell, M. Breidt and H. Bülthoff, "Render me real?: investigating the effect of render style on the perception of animated virtual humans", *ACM Transactions on Graphics*, vol. 31, no. 4, pp. 1-11, 2012. Available: https://dl-acm-org.gold.idm.oclc.org/doi/10.1145/2185520.2185587. [Accessed 9 May 2022].

[428] M. Cheetham, P. Suter and L. Jaencke, "The Human Likeness Dimension of the “Uncanny Valley Hypothesis”: Behavioral and Functional MRI Findings", *Frontiers in human neuroscience*, vol. 5, pp. 126-126, 2011. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3223398/. [Accessed 10 May 2022].

[429] J. Seyama and R. Nagayama, "The Uncanny Valley: Effect of Realism on the Impression of Artificial Human Faces", *Presence: Teleoperators and Virtual Environments*, vol. 16, no. 4, pp. 337–351, 2007. Available: https://ieeexplore.ieee.org/document/6797708. [Accessed 10 May 2022].

[430] A. Saygin, T. Chaminade, H. shiguro, J. Driver and C. Frith, "The thing that should not be: predictive coding and the uncanny valley in perceiving human and humanoid robot actions", *Social cognitive and affective neuroscience,*, vol. 7, no. 4, pp. 413–422, 2011. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3324571/. [Accessed 9 May 2022].

[431] S. Schindler, E. Zell, M. Botsch and J. Kissler, "Differential effects of face-realism and emotion on event-related brain potentials and their implications for the uncanny valley theory", *Scientific reports*, vol. 7, no. 1, pp. 45003-45003, 2017. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5362933/. [Accessed 10 May 2022].

[432] A. Cheok and O. Fernando, "Kawaii/Cute interactive media", *Universal Access in the Information Society*, vol. 11, pp. 295–309, 2012. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s10209-011-0249-5. [Accessed 4 May 2022].

[433] T. Botz-Bornstein, "Wong Kar-wai’s Films and the Culture of the Kawaii", *Substance*, vol. 37, no. 2, pp. 94-109, 2008. Available: https://www-proquest-

com.gold.idm.oclc.org/docview/2085759874?pq-origsite=primo&accountid=11149. [Accessed 4 May 2022].

[434] H. Nittono, M. Fukushima, A. Yano and H. Moriya, "The Power of Kawaii: Viewing Cute Images Promotes a Careful Behavior and Narrows Attentional Focus", *PLoS One*, vol. 7, no. 9, p. e46362, 2012. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3458879/. [Accessed 4 May 2022].

[435] S. Ngai, *Our Aesthetic Categories: Zany, Cute, Interesting*, 1st ed. Haravard University Press, 2015.

[436] K. Koma, "Kawaii as Represented in Scientific Research: The Possibilities of Kawaii Cultural Studies", *Hemispheres (Wrocław, Poland),* vol. 28, no. 28, pp. 103-115, 2013. Available: https://www-proquest-com.gold.idm.oclc.org/docview/1539530537?pq-origsite=primo&accountid=11149. [Accessed 4 May 2022].

[437] M. Pellitteri, "Kawaii Aesthetics from Japan to Europe: Theory of the Japanese “Cute” and Transcultural Adoption of Its Styles in Italian and French Comics Production and Commodified Culture Goods", *Arts*, vol. 7, no. 3, 2018. Available: https://www-proquest-com.gold.idm.oclc.org/docview/2211349892?pq-origsite=primo&accountid=11149. [Accessed 4 May 2022].

[438] Y. Gao, "‘可爱’:一种新的审美时尚/ ‘Cute’: a New Aesthetic Trend", *New Horizons from Tianfu*, vol. 2008, no. 4, pp. 149-151, 2008. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2008&filename=TFXL200804034&uniplatform=NZKPT&v=IulAqnVKC94-ni-EI6Fb-EnJlDdhrbbvvCnw2Zh0ZvDhnDoi_IVEMQG_LtqeeWwV. [Accessed 6 May 2022].

[439] B. Liu, "日本‘可爱文化’对中国动画发展道路的启示/The Inspiration of Japanese ‘Cute Culture’ to the Development of Chinese Animation", *Southeast Communication*, vol. 2012, no. 9, pp. 150-151, 2012. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2012&filename=DNCB201209059&uniplatform=NZKPT&v=FikvpYFGCHZUB9J-kSxwevsXM4WVuVfYiW6MsSs8Kuwnd3xMiwSu13YpXQpHYUr_. [Accessed 6 May 2022].

[440] X. Zhou, “‘萌’作为一种美/ ‘Cute’ as Aesthetic", *Journal of Inner Mongolia Arts University*, vol. 11, no. 1, pp. 5-18, 2014. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2014&filename=NMYS201401004&uniplatform=NZKPT&v=71iegey2fp1e0tjWdQycsp0e5ofyVp29li8_7_XobuASHRL9JPAqK6hM06kUsNs3. [Accessed 6 May 2022].

[441] X. Lv, Y. Liu, J. Luo, Y. Liu and C. Li, "Does a cute artificial intelligence assistant soften the blow? The impact of cuteness on customer tolerance of assistant service failure", *Annals of*

tourism research, vol. 87, p. 103114, 2021. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0160738320302589. [Accessed 6 May 2022].

[442] IVC Author, “Cute Technics in the Love Machine”, *InVisible Culture*, issue. 21, 2014. Available: https://ivc.lib.rochester.edu/cute-technics-in-the-love-machine/. [Accessed 6 May 2022].

[443] G. Davis, "Review: Anne Fausto-Sterling's Sex/Gender: Disrupting Assumptions About Gender, Sex, and Sexuality", *Journal of Family Theory & Review*, vol. 5, no. 2, pp. 156-158, 2013. Available: https://onlinelibrary-wiley-com.gold.idm.oclc.org/doi/full/10.1111/jftr.12010. [Accessed 6 May 2022].

[444] J. Osgood and S. Mohandas, "Reconfiguring the ‘Male Montessorian’: the mattering of gender through pink towering practices", *Early Years*, vol. 40, no. 1, pp. 67-81, 2019. Available: https://www.tandfonline.com/doi/full/10.1080/09575146.2019.1620181. [Accessed 6 May 2022].

[445] H. Clark, "Review: Pink: The History of a Punk, Pretty, Powerful Color", *CAA.Reviews*, 2019. Available: https://www.proquest.com/docview/2233166685?accountid=11149&parentSessionId=lHPQ%2FJqwtllc22zi12URN4JCDL4GYA6vAAoE09AmLd4%3D&pq-origsite=primo. [Accessed 6 May 2022].

[446] "The Pink Ribbon Foundation Fundraising", *The Pink Ribbon Foundation Fundraising*. [Online]. Available: https://www.pinkribbonfoundation.org.uk/. [Accessed: 06- May- 2022].

[447] "Our Mission — PUSSYHAT PROJECT™", *PUSSYHAT PROJECT™*. [Online]. Available: https://www.pussyhatproject.com/blog/2016/11/22/our-mission. [Accessed: 06- May- 2022].

[448] "CODEPINK - Women for Peace", *CODEPINK - Women for Peace*. [Online]. Available: https://www.codepink.org/. [Accessed: 06- May- 2022].

[449] M. Walsh, "A Feminine Cinematics: Luce Irigaray, Women and Film by Caroline Bainbridge", *Senses of Cinema*, no. 53, 2009. Available: https://www.sensesofcinema.com/2009/book-reviews/a-feminine-cinematics-luce-irigaray-women-and-film-by-caroline-bainbridge/. [Accessed 6 May 2022].

[450] D. Haraway, *Staying with the Trouble: Making Kin in the Chthulucene*. Duke University Press, 2016.

[451] "New words list September 2006 | Oxford English Dictionary", *Oxford English Dictionary*. [Online]. Available: https://public.oed.com/updates/new-words-list-september-2006/. [Accessed: 08- May- 2022].

[452] "New words list: June 2012 | Oxford English Dictionary", *Oxford English Dictionary*. [Online]. Available: https://public.oed.com/updates/new-words-list-june-2012/. [Accessed: 08- May- 2022].

[453] "Bling", *Search-credoreference-com.gold.idm.oclc.org*. [Online]. Available: https://search-credoreference-com.gold.idm.oclc.org/content/entry/sjpst/bling/0. [Accessed: 08- May- 2022].

[454] T. Fessenden, "Bling", *Journal of the American Academy of Religion*, vol. 87, no. 3, pp. 635–641, 2019. Available: https://academic.oup.com/jaar/article/87/3/635/5550160. [Accessed 8 May 2022].

[455] L. Duan, "The Aesthetics of Inscape:Teaching Chinese Art with Barthesian Semiotic Theory", *The Journal of Aesthetic Education*, vol. 53, no. 1, 2019. Available: https://muse-jhu-edu.gold.idm.oclc.org/article/719316. [Accessed 8 May 2022].

[456] "Beyond bling", *The Economist*, 2013. [Online]. Available: https://www.economist.com/business/2013/06/08/beyond-bling. [Accessed: 08- May- 2022].

[457] L. Montgomery, "'Beijing bling': creative details and consumer choices in contemporary China: An Interview with Hung Huang", *International Journal of Cultural Studies*, vol. 9, no. 3, pp. 369-376, 2006. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/abs/10.1177/1367877906066882. [Accessed 8 May 2022].

[458] L. Guest, "Material Girls, Super Starlets and Girls with Swagger – The Art Life", *Theartlife.com.au*, 2013. [Online]. Available: http://theartlife.com.au/2013/material-girls-super-starlets-and-girls-with-swagger/. [Accessed: 08- May- 2022].

[459] V. Braun, G. Tricklebank and V. Clarke, ""It Shouldn't Stick Out from Your Bikini at the Beach": Meaning, Gender, and the Hairy/Hairless Body", *Psychology of Women Quarterly*, vol. 37, no. 4, pp. 478-493, 2013. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/0361684313492950. [Accessed 9 May 2022].

[460] M. Toerien and S. Wilkinson, "Exploring the depilation norm: a qualitative questionnaire study of women's body hair removal", *Qualitative research in psychology*, vol. 1, no. 1, pp. 69-92, 2005. Available: https://www-tandfonline-com.gold.idm.oclc.org/doi/abs/10.1191/1478088704qp006oa. [Accessed 9 May 2022].

[461] M. Toerien, W. Sue and P. Choi, "Body Hair Removal: The 'Mundane' Production of Normative Femininity", *Sex roles*, vol. 52, no. 5-6, pp. 399-406, 2005. Available: https://www-proquest-com.gold.idm.oclc.org/docview/225366727?accountid=11149&pq-origsite=primo. [Accessed 9 May 2022].

[462] M. Tiggemann and S. Kenyon, "The Hairlessness Norm: The Removal of Body Hair in Women", *Sex Roles*, vol. 39, no. 11-12, pp. 873–885, 1998. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1023/A%3A1018828722102. [Accessed 9 May 2022].

[463] S. Xu, "从‘身体发肤受之父母,不敢毁伤‘看儒家的孝/ 'Confucian Filial Piety from the Perspective of' the Body, Hair and Skin of the Parents, Do not Dare to Destroy", *Qun Wen Tian Di*,

vol. 01, pp. 99-101, 2011. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2011&filename=QWTD201105033&uniplatform=NZKPT&v=w5qDzeLpxrwqfWRQz1MqamvrA9Ggb9m_xSKa29Ww7Ffj1VlHxbOGJ8N7P77QX62L. [Accessed 9 May 2022].

[464] M. Cheng, “现代人‘毛’病知多少──试论整体脱毛市场的潜力与发展/How Much is Known about Modern Problems - A Look at the Potential and Development of the Total Hair Removal Market", *Chinese Journal of Aesthetic Medicine*, vol. 1, p. 62, 1999. Available: https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD9899&filename=MRYX199901039&uniplatform=NZKPT&v=Dg3LwLWlqeezhkGXQFgIkwJEJLsQYREyUt2-iQfa4jzmWhaXC-9wBAaw9phSZS0E. [Accessed 9 May 2022].

[465] A. Benamira and S. Pattanaik, "A combined scattering and diffraction model for elliptical hair rendering", *Computer Graphics Forum*, vol. 40, no. 4, pp. 163-175, 2021. Available: https://onlinelibrary-wiley-com.gold.idm.oclc.org/doi/full/10.1111/cgf.14349. [Accessed 9 May 2022].

[466] L. Yan, C. Tseng, H. Jensen and R. Ramamoorthi, "Physically-accurate fur reflectance: modeling, measurement and rendering", *ACM Transactions on Graphics*, vol. 34, no. 6, pp. 1–13, 2015. Available: https://dl-acm-org.gold.idm.oclc.org/doi/10.1145/2816795.2818080. [Accessed 9 May 2022].

[467] J. FRISCIA, "This Isn't a Photo, This Is Unity Engine Going Wild with Real-Time Hair Strands", *The Escapist*, 2022. [Online]. Available: https://www.escapistmagazine.com/unity-engine-enemies-demo-real-time-strand-based-hair/. [Accessed: 09- May- 2022].

[468] A. Wood, "Recursive Space: Play and Creating Space", *Games and Culture*, vol. 7, no. 1, pp. 87-105, 2012. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/full/10.1177/1555412012440310. [Accessed 11 May 2021].

[469] G. Riva, F. Mantovani and C. Capideville, “Affective Interactions Using Virtual Reality: The Link between Presence and Emotions”, *CyberPsychology & Behavior*, vol. 10, no. 1, pp. 45-56, 2007.
Available: https://www.researchgate.net/publication/6500998_Affective_Interactions_Using_Virtual_Reality_The_Link_between_Presence_and_Emotions. [Accessed 19 May 2021].

[470] E. Schuurink and A. Toet, “Effects of Third Person Perspective on Affective Appraisal and Engagement: Findings from SECOND LIFE”, *Simulation & Gaming*, vol. 41, no. 5, pp. 724-742, 2010. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/abs/10.1177/1046878110365515. [Accessed 19 May 2021].

[471] K. Kallinen, M. Salminen, N. Ravaja, R. Kedzior and M. Sääksjärvi, “Presence and emotion in computer game players during 1st person vs. 3rd person playing view: Evidence from self-report, eye-tracking, and facial muscle activity data”, in *PRESENCE 2007*, 2007, pp. 187-190.

[472] K. Vogeley, M. May, A. Ritzl, P. Falkai, K. Zilles and G. Fink, “Neural Correlates of First-Person Perspective as One Constituent of Human Self-Consciousness”, *Journal of Cognitive Neuroscience*, vol. 16, no. 5, pp. 817–827, 2004.
Available: https://direct.mit.edu/jocn/article/16/5/817/3883/Neural-Correlates-of-First-Person-Perspective-as. [Accessed 19 May 2021].

[473] G. Gorisse, O. Christmann, E. Amato and S. Richir, “First- and Third-Person Perspectives in Immersive Virtual Environments: Presence and Performance Analysis of Embodied Users”, *FRONTIERS IN ROBOTICS AND AI*, vol. 4, pp. 1-7, 2017.
Available: https://www.frontiersin.org/articles/10.3389/frobt.2017.00033/full. [Accessed 21 May 2021].

[474] H. Debarba, E. Molla, B. Herbelin and R. Boulic, “Characterizing Embodied Interaction in First and Third Person Perspective Viewpoints”, *IEEE Symposium on 3D User Interfaces (3DUI)*, vol. 2015, pp. 67-72, 2015. Available: https://ieeexplore-ieee-org.gold.idm.oclc.org/document/7131728. [Accessed 21 May 2021].

[475] P. Salamin, D. Thalmann and F. Vexo, “The benefits of third-person perspective in virtual and augmented reality?”, *In Proceedings of the ACM symposium on Virtual reality software and technology*, vol. 2006, pp. 27-30, 2006.
Available: https://dl.acm.org/doi/10.1145/1180495.1180502. [Accessed 21 May 2021].

[476] D. Monteiro, H. Liang, W. Xu, M. Brucker, V. Nanjappan and Y. Yue, “Evaluating enjoyment, presence, and emulator sickness in VR games based on first- and third- person viewing perspectives”, *Computer Animation & Virtual Worlds*, vol. 29, no., 2018.
Available: https://onlinelibrary.wiley.com/doi/abs/10.1002/cav.1830. [Accessed 21 May 2021].

[477] Himo, *Second Person Shooter Zato*. Himo, 2011.

[478] J. Polson, "Interview: Japanese Indie Dev Himo Crafts A Second Person Shooter", *John Polson's Blog*, 2011.

[479] *Assassin’s Creed*. Ubisoft Montreal, 2007.

[480] *God of War*. SIE Santa Monica Studio; Sony Interactive Entertainment LLC, 2021.

[481] *Superliminal*. Pillow Castle, 2019.

[482] B. Munk,*Maneater*. Tripwire Interactive, Blindside Interactive, 2020.

[483] P. Iwanicki and P. Rriska, *Superhot*. Superhot Team, 2020.

[484] W. Latham, *Evolva*. NA: Interplay Entertainment, EU: Virgin Interactive, 2000.

[485] S. Craig, E. Chiou and N. Schroeder, "The Impact of Virtual Human Voice on Learner Trust", *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, vol. 63, no. 1, pp. 2272-2276, 2019. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/abs/10.1177/1071181319631517. [Accessed 3 May 2022].

[486] D. Williams, S. Caplan and L. Xiong, "Can You Hear Me Now? The Impact of Voice in an Online Gaming Community", *Human Communication Research*, vol. 33, no. 4, pp. 427–449, 2007. Available: https://academic.oup.com/hcr/article/33/4/427/4210727. [Accessed 3 May 2022].

[487] C. Nass and L. Gong, "SPEECH INTERFACES from an EVOLUTIONARY PERSPECTIVE", *Communications of the ACM*, vol. 43, no. 9, pp. 36–43, 2000. Available: https://www.thefreelibrary.com/SPEECH+INTERFACES+from+an+EVOLUTIONARY+PERSPECTIVE.-a065277886. [Accessed 3 May 2022].

[488] G. Veletsianos, "The impact and implications of virtual character expressiveness on learning and agent–learner interactions", *Journal of Computer Assisted Learning*, vol. 25, no. 4, 2009. Available: https://onlinelibrary-wiley-com.gold.idm.oclc.org/doi/full/10.1111/j.1365-2729.2009.00317.x. [Accessed 3 May 2022].

[489] E. Chiou, N. Schroeder and S. Craig, "How we trust, perceive, and learn from virtual humans: The influence of voice quality", *Computers and education*, vol. 146, p. 103756, 2020. Available: https://www-sciencedirect-com.gold.idm.oclc.org/science/article/pii/S0360131519303094. [Accessed 3 May 2022].

[490] H. Kim, M. Cha and Y. Ji, "settings Open Access Article the Impact of an Agent's Voice in Psychological Counseling: Session Evaluation and Counselor Rating", *Applied sciences*, vol. 11, p. 2893, 2021. Available: https://www.mdpi.com/2076-3417/11/7/2893/htm. [Accessed 4 May 2022].

[491] "CNKI", *Oversea.cnki.net*, 1996. [Online]. Available: https://oversea.cnki.net/index/Support/en/Introduction.html. [Accessed: 18- Jul- 2021].

[492] A. Ibrahim, "In Feel My Metaverse, Keiken wants us to unlearn our reality to form new kinship", *Itsnicethat.com*, 2019. [Online]. Available: https://www.itsnicethat.com/articles/keiken-feel-my-metaverse-digital-091019. [Accessed: 27- Apr- 2022].

[493] B. Theory, "UNCLE ROY ALL AROUND YOU", *blasttheory.co.uk*. [Online]. Available: https://www.blasttheory.co.uk/projects/uncle-roy-all-around-you/. [Accessed: 27- Apr- 2022].

[494] I. Cheng, "Ian Cheng", *Iancheng.com*. [Online]. Available: http://iancheng.com/. [Accessed: 27- Apr- 2022].

[495] T. Hart, Sound, Focus, Video, Photo, and Reviews, "Dining on trauma: Danielle Brathwaite-Shirley talks trans-tourism, motherhood, & being a 'freaky Friday everyday,'" *atractivoquenobello.* [Online]. Available: https://www.aqnb.com/2020/08/10/dining-on-trauma-

danielle-brathwaite-shirley-on-trans-tourism-motherhood-and-being-a-freaky-friday-everyday/. [Accessed: 05-Apr-2023].

[496] J. Ong, "Lawrence Lek talks simulation art and his interest in the ambiguity between two paradoxes", *Itsnicethat.com*, 2021. [Online]. Available: https://www.itsnicethat.com/features/lawrence-lek-in-conversation-digital-art-120121. [Accessed: 27- Apr- 2022].

[497] D. Brathwaite-Shirley, "The Resurrection Lands", *The Resurrection Lands*. [Online]. Available: http://resurrectionland.com/. [Accessed: 15- Jul- 2022].

[498] E.Barrett and B. Bolt, *Practice as Research: Approaches to Creative Arts Enquiry,* London: I.B. Tauris, 2007.

[499] E.Barrett and B. Bolt, *Carnal Knowledge: Towards a New Materialism through the Arts,* London: I.B. Tauris, 2007.

[500] "pete jiadong qiang", *Jiadongqiang.co.uk*. [Online]. Available: https://www.jiadongqiang.co.uk/. [Accessed: 13- May- 2022].

[501] S. Park and R. Catrambone, "Social Facilitation Effects of Virtual Humans", *Human Factors: The Journal of the Human Factors and Ergonomics Society*, vol. 49, no. 6, pp. 1054-1060, 2007. Available: https://journals-sagepub-com.gold.idm.oclc.org/doi/abs/10.1518/001872007X249910. [Accessed 3 May 2022].

[502] K. Dill and K. Thill, "Video Game Characters and the Socialization of Gender Roles: Young People's Perceptions Mirror Sexist Media Depictions", *Sex roles*, vol. 57, no. 11, pp. 851–864, 2007. Available: https://link-springer-com.gold.idm.oclc.org/article/10.1007/s11199-007-9278-1. [Accessed 6 April 2022].

[503] K. Stewart, "Tactile compositions", in *Objects and Materials*, 1st ed., P. Harvey, E. Casella, G. Evans, H. Knox, C. McLean, E. Silva, N. Thoburn and K. Woodward, Ed. London: Routledge, 2014.

[504] B. Anderson and P. Harrison, *Taking-Place: Non-Representational Theories and Geography*, 1st ed. Routledge, 2010.

[505] "Exhibition: #Chicken# Loading@PUBG", *Gene-gallery.com*. [Online]. Available: http://www.gene-gallery.com/webapp/exhibitionInfo?page=exhibition-info&Language=en_US&exId=40. [Accessed: 19- Apr- 2022].

[506] Y. Han, "Screenshots from VR GameArt Prototype 'Cyber JiangHu'," 2023.

[507] "Ian Cheng: Emissaries," Serpentine Galleries, https://www.serpentinegalleries.org/whats-on/ian-cheng-emissaries/. [Accessed: 19- Jan- 2024].

[508] K. Brown, “Art we love: The jubilant catharsis of Pipilotti Rist’s rampage,” Artnet News, https://news.artnet.com/art-world-archives/pipilotti-rist-ever-is-over-all-2412137 [Accessed: 20-Jan- 2024].

[509] C. Hao, Y. Gei, Z. Zhang, and Q. Hao, "瓦克曼技术女性主义思想/ Wajcman’s TechnoFeminist Theory", *Yinshan Academic Journal (Natural Science Edition)*, vol. 2006, no. 02, pp. 121-122, 2006. Available: https://kns.cnki.net/kcms2/article/abstract?v=Ma1nt2RbXajtthaQfRxzfyuMAI__BhWJqm2dGuGUDoNjS-gwJMwXg2BzlGcpdIZg6-XmdsLe1L6q-pSe4YDr89M4ibUJzQpfcGZxQkrynFptX6w1jKYsjn_BZCttPTNQO0LefuqpArA=&uniplatform=NZKPT&language=CHS. [Accessed 4 February 2023].

[510] Y. Sun and, Y. Fang, "技术现代性批判及其思考——基于技术女性主义视角的研究/Critical Analysis of Technological Modernity and Its Reflection: A Study Based on the Perspective of Techno Feminism"
, *Social Sciences in Yunnan*, vol. 2014, no. 06, pp. 40-45, 2014. Available: https://kns.cnki.net/kcms2/article/abstract?v=Ma1nt2RbXahKqZnXyBFgaCf4cPvjrfdgjPLJlyjPNsWryP6wNJ9GsFS7c1uvU01ceQJt_gPLzWl22daKkQXcxGUkc6ln1TxBO9hm9FWdCBiIpi3AaVjm3FTd5UWmf3KKbiOnKyu6bgp-dXmKI4QmEg==&uniplatform=NZKPT&language=CHS. [Accessed 4 February 2023].

[511] M. Zhang and, L. Gao, "瓦克曼的技术女性主义思想评析/An Analysis on Judy Wajcman’s TechnoFeminist", *Studies in Dialectics of Nature*, vol.27, no. 01, pp. 29-34, 2011. Available: https://kns.cnki.net/kcms2/article/abstract?v=Ma1nt2RbXajGldiNIGewJRb9dfTss_BxX-Pr8nBdVFPlb_jb6hmhjY37LIy64o06OXlUFlbxNxAKxQG_6RxbZkGTKt6W6F1iW0GK9iWD0tIIpHZgSKCRLSiZNtxV2X9JS7W8XmdIqrI=&uniplatform=NZKPT&language=CHS. [Accessed 4 February 2023].

[512] Y. Chen and, F. Xiao, "技术女性主义述评/Review of TechnoFeminism", *Studies in Philosophy of Science and Technology*, vol.28, no. 01, pp. 67-72, 2011. Available: https://kns.cnki.net/kcms2/article/abstract?v=Ma1nt2RbXah30bFsIhFLk4Ac6QRRQc8LcFK83SbR6CD_uP73lLIGO63o39wMRbUHGcLizDMGnmTkCflXvFhTms4VKHSpLuWoQrLk9cgjVXn3hJq3yziavhhdbMtjBUS8T0H8XGFPU_s=&uniplatform=NZKPT&language=CHS. [Accessed 4 February 2023].

[513] L. Yang, "技术女性主义视角下的时间经验——瓦克曼《时间逼迫:数字资本主义中生命的加速》解读/Temporal Experience from the Perspective of Technofeminism: Interpretation of Wajcman’s Pressed for Time: The Acceleration of Life in Digital Capitalism", *China Book Review*, vol.2019, no. 07, pp. 99-108, 2019. Available: https://kns.cnki.net/kcms2/article/abstract?v=Ma1nt2RbXahXuSH4eBk2zgH3OxirQ6elEgLHMaBogfe9Xud2otttIMjE9XMhbcAyaOpT3Je0q5V826DZ0eN0kN9qCHvZ4TGBrBMAzW1FKVSbp1DCLa3H2UziRpg2GUU78IGK-d62W9oF8prDcOR8tg==&uniplatform=NZKPT&language=CHS. [Accessed 4 August 2023].

[514] L. Shao, “The techno-beauty myth: the self-representations of young Chinese women on social media,” *Journal of gender studies*, vol. ahead-of-print, no. ahead-of-print, pp. 1–13, 2023, doi: 10.1080/09589236.2023.2207001.

[515] A. Y. Peng, “Alipay adds "beauty filters" to face-scan payments: a form of patriarchal control over women's bodies,” *Feminist media studies*, vol. 20, no. 4, pp. 582–585, 2020, doi: 10.1080/14680777.2020.1750779.

[516] J. Wajcman, “TechnoCapitalism Meets TechnoFeminism: Women and Technology in a Wireless World,” *Labour & industry (Brisbane, Qld.)*, vol. 16, no. 3, pp. 7–20, 2006, doi: 10.1080/10301763.2006.10669327.

[517] J. Liu, "当代女性自我价值的实现困境及路径选择/ The Dilemmas and Path Choices for the Realization of Contemporary Women's Self-Value", *Journal of Changchun Normal University*, vol.43, no. 03, pp. 42-45, 2024. Available: https://kns.cnki.net/kcms2/article/abstract?v=nouGVBS_tgfy9WA1g262Lty1gghxI3osq-QZ_tnMD16zY2v4ezMHY144fTOJPOvKgwezM4m1xCH131w82CNxEyg0uLO1xIO_yBh2qAd6BjUrxgFcmVjLFJDYX9dd1QeH9RRXC2WEzeg=&uniplatform=NZKPT&language=CHS [Accessed 14 March 2024].

[518] M. Lu, "西方女性主义思潮在中国的流变与影响/Evolution and Influences of Western Feminist Thoughts in China ", *Journal of Shandong Women's University*, vol.2024, no. 02, pp. 36-43, 2024. Available: https://kns.cnki.net/kcms2/article/abstract?v=nouGVBS_tgfg0Oz8RnwJqHHPbMPt-OG1BSnChdiVNRqDx0wYZe0_bvP4vm3M2r2AxEga4gintODnjupRtzs-2kz0o-cPaxvd2BmSMzMTmzc2kOqVHi_sFoxUkYxWEHkku1zMItUNvNM=&uniplatform=NZKPT&language=CHS [Accessed 4 March 2024].

Appendix

Appendix A: Links

Appendix B: Bibliography

Appendix C: Prototype Design

Appendix D: Workshops

Appendix E: Guiding Questions for Group Discussions

Appendix F: Low-fidelity Prototypes Toolkit

Appendix G: Excerpts From Group Discussions

Appendix H: Low-fidelity Prototypes Created by Participants

Appendix I: Performative Survey Questionnaire Data Report

Annex

Annex A: VR GameArt Prototype Application

Annex B: Interviews with Industry Professionals

Annex C: Workshop Video

Annex D: Ethics Information Sheet and Consent Forms