An Investigation on Chinese Youth's Inclination towards AI Partner by Sex

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Abstract: With more and more interactive artificial intelligence (AI) and robots are designed and developed, they have a huge potential to replace humans in many aspects. The replacement will cause significant changes to society because robots have efficient processing systems. In terms of a romantic relationship, AI partners are capable of becoming a substitute for human partners, but we do not know which group of people and how many people will accept such a love affair and what are people thinking about AI partners. Given the fact that AI products, which focus on romantic partners, are still in the emerging phase, we assume the youths with age under around 20 will have the opportunity to try to have a romantic relationship with the AI partners that are very similar in physical appearance as the real human partners. In this study, the population is the Chinese youths, and we designed an online survey that was posted through social media and had 104 voluntary respondents. The questions in the survey focused on investigating the respondents' inclination towards AI partners.

1. Introduction

There is a growing trend of producing artificial intelligence worldwide, and the different forms of artificial intelligence have improved the economy and convenience for society. Despite the popular industrial robots, there are also robots to stimulate the interaction between robots and humans. China is making progress in designing various kinds of robots, and the numbers of AI enterprises in China account for about 23% of the world's total AI enterprises [1]. China was also the second-largest AI producer in 2018, so Chinese people are continuing to experience technology changes. Although most of the productions now are industrial robots, China has produced a different robot named Jia Jia, the first female interactive robot designed by the University of Science and Technology of China. Jia Jia has shown people the future of interactive robots in China.

The human-Robot relationship is a field where people are studying the interaction between humans and robots. People only new very little about human-robot relationship, even scientists are searching the possibility of this special romantic relationship [2]. Although people often do not perceive robots like humans, people treat robots with empathy and other emotions. According to the Media Equation, people naturally behave socially towards machines, including computers, televisions, and other media [3]. Therefore, it is not surprising that people can have emotional bonds with machines like robots. While there are already some forms of interactive robots for supervising children, there could also be robots that can be people's romantic partners. Since most people have a hectic and fast-paced life, there is little or no time to meet real persons and start romantic relationships with them. Then, AI robots can become a substitute.

In the journal of Hendrick, he mentioned Lee's love theory, which is that there are three primary love attitudes, including eros or passionate love, ludus or game-playing love, and storage or friendship-based love [4]. These primary love attitudes create various subsets, including storage, agape, mania, pragama, ludus and eros, result in different definitions of love. According to a study from the University of Miami, on the one hand, males tend to be ludus and are more interested in

visual sexual stimuli. On the other hand, women are more passionate or eros and focus on the commitment and ability of men in one relationship [3]. The disparate definitions of love between men and women also show their expectations of partners. For instance, people always hold the stereotype that men only care about their appearance when looking for a partner.

The definition of love is various, and different groups of people hold different perspectives towards it. The cultural differences between Asia and America make the role of romantic partners different. A romantic partner for Chinese people is someone they consider spending their whole life with because they view romantic relationships seriously and treat their partners with responsibility. A research suggests that in Asian culture, people engage more in pragma, which is thinking in a more pragmatic way. While western culture might consider a person who goes out on a casual date with a romantic partner. Despite cultural differences, the definition of romance can still be different among people. The idea of falling in love with machines or nonliving objects is not a fantasy for people. For example, people with objectophilia could fall in love with nonliving objects because they might have experienced trauma in their childhood. Furthermore, men and women also view love differently because they hold various opinions toward love.

This research will focus on how males and females hold the view of having a romantic relationship with AI by analyzing the results of a survey. Throughout the paper, first, a literature review will discuss how humanoid robots with specific features can serve as romantic partners for humans. It also provides background information about intimate relationships between robots and humans for this research. Then, an observation will be discussed and followed by a hypothesis. Furthermore, the methodology of this research will show how and why the survey was designed. The statistics, conclusion, and application of the research are also discussed. The results will improve the understanding of intimate relationships between humans and robots. Also, the outcomes will explain the possible explanation for different genders holding different views towards AI partners. Since most of the interactive robots produced now are female, the female consumers' demands should also be considered. It is significant to realize how the different genders contribute to the different views towards AI partners, which is beneficial to designing interactive robots that can satisfy both genders in the future.

2. Literature Review

David Levy in his book titled “Love and Sex with robotics” published in 2007. It’s the first book which raised and discussed this topic [5]. Then, one study by Viik explained that specific characteristics or features made humans fall in love with another human being and explained the possibility of experiencing romantic relationships with robots. Viik used the post-phenomenological method to describe “human experience from how something appeared to and was perceived by a human subject” [6]. This method showed how people perceived things subjectively and would help to know how people feel when they are interacting with robots. Viik suggested that robots who are emotionally intelligent are crucial for a robotic lover because they could react and act in a socially acceptable manner. She also mentioned that a robot with gender should be equipped with “gender-specific interactive body parts that enable human-like sexual intercourse” [6]. This showed that robots with genders need to be equipped with features similar to a real human being to create a better romantic relationship. She pointed out that people need feedback from their romantic partners, so a robotic lover has to understand love and show their affection naturally. If robots are not equipped with emotions, people will feel a sense of alterity, which means “otherness” [6]. Therefore, although robots with attractive physical creatures might make people interact with them, a romantic relationship will only be developed if robots understand love and are equipped with gender-specific characteristics.

This study provide background for this research and the questions in the survey, which also ask people about some expectations they hold for a robotic lover.

3. Observation & Hypothesis

The overall sex ratio in China is at an acceptable level. According to the Tabulation on the 2010 Population Census of the People's Republic of China by County, the sex ratio of China in 2010 was 104.9, slightly lower than the WHO's threshold for the healthy sex ratio 105. Sex ratio at marriageable ages is basically stable. It's true that some geographic factors interact to influence the sex ratio, and couples often have age gap, which would influence the romantic relationship between males and females. Actually, this small problem on sex ratio could be easily solved by increasing fertility rate [7]. However, China's population of males and females was unevenly distributed in different cities and provinces. Tianjin and Chongqing are the two extremes. Tianjin's sex ratio was 114.52, but that of Chongqing was only 102.61. The imbalanced sex ratio situation is even more severe for the generation born in the 1990s and 2000s. The sex ratio of the newborns was relatively and significantly higher than the history's and the world's level. In 2000, the sex ratios of the newborns in cities, towns, and countryside were 112.8, 116.5, and 118.1, respectively [2]. This imbalanced sex ratio causes young males to face more difficulties when finding a long-term female partner. Moreover, a substantial portion of China's youth are animation fans, and part of the male animation fans lack social interaction in their lives. 70% of the male animation fans claim that they love staying at home to play video games and watch cartoons [4]. Staying at home for a very long time might cause them to be afraid of communicating with strangers and even develop some mental disorders, which would also make the males unsuccessful in interacting with females.

However, AI (Robot) partners can be suitable substitutes for human partners, regardless of these social problems. First, AI can be produced in great quantities once the programming is done in advance. Any gap between the population of different sexes will be fixed. Second, the price of AI and robot partners is likely to be at an acceptable level. As an artificially intelligent sex robot from Abyss Creations was sold for $10,000 in 2018, after eliminating the influence of inflation, the AI robot partner can be maintained at a similar price in the future because of the development of technology and massive production. Third, for the people lacking communication skills, AI partners can be programmed to be kind and friendly all the time, so the users would not have any problems talking and living with their partners.

Although the sex ratio problem is universal in China, this research will only focus on the Chinese youth's inclination. The AI technology has not been ideally developed, and the current robotic simulation of human languages and actions is still not realistic. When the people born in the late 1990s and early 2000s turn into 30s or 40s, the AI technology will become more developed, so AI partners would have the ability to well behave like humans; people would believe the robots are authentic humans without a hint. Thus, studying this generation's willingness to have relationships with AI partners can provide the most useful information to predict and prepare for the future. Moreover, given that the generation born in the late 1990s and early 2000s faces an unprecedented imbalance of sex ratio, the males may develop the most prominent willingness to have AI partners rather than real people.

Therefore, the hypothesis is that Chinese male youths are more likely to consider having a romantic relationship with an AI partner.

4. Method

A survey was designed to gather precise and quantitative opinions from people. In the survey, the target population is Chinese high school and college students. The survey asked the respondents to answer their age. Only the responses from people aged 15-22 (the typical ages for high school and college students in China) are considered. The survey has been designed using the professional survey design website wjx.cn and spread on the internet (mainly on WeChat) available for 24 hours. The survey's questions mainly focus on people's tendency to find AI partners people's reasoning for this relationship.

5. Results And Discussions

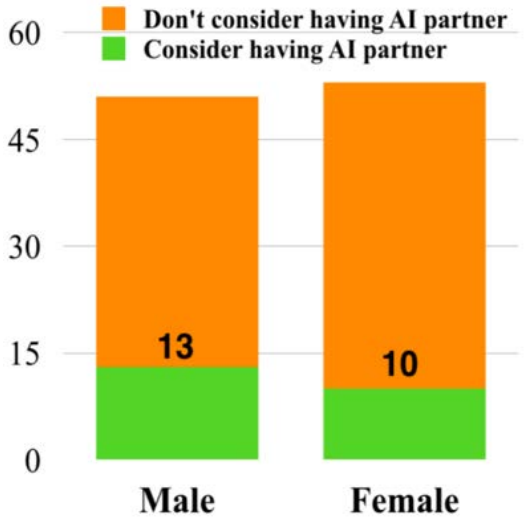

Figure 1. Different gender's attitude towards AI partners

There were 104 valid responses, and the respondents' ages were distributed from 17 to 22. The sample included 51 males and 53 females. For the question "when AI technology becomes much better than today's, would you consider having a romantic relationship with AI (robot)?" As shown in Figure 1, 13 out of the 51 male respondents answered "Yes," which means they will consider having AI partners. Furthermore, 10 out of the 53 female respondents claimed they had the same numbers of male and female respondents were not equal, more males wanted to have AI partners, the percentage of which was 25.4%; On the contrary, only 18.8% of the females were willing to accept AI partners. As shown in Figure 2, for the 23 respondents who chose to have a romantic relationship with AI, 57% was male, and 43% was female. The outcome confirmed the hypothesis that male youths are more likely to have AI partners.

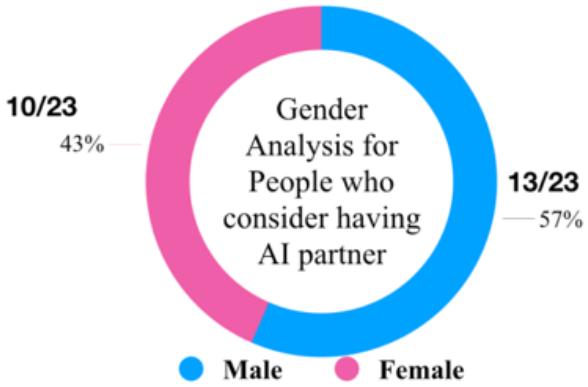

Figure 2. Gender Analysis for people who consider having an AI partner

After dividing the percentage of males who were willing to accept AI partners by the percentage of the female who were willing to have AI partners, the sex ratios of AI partner demanders could be calculated, which was equal to 135.10. Given the high sex ratio of the newborn at the beginning of the 21st century, as shown in Table 1, it led to a possible assumption that if 135 males wanted to have AI partners, the 100 males might be interested in AI and robots, but the other 35 males could be forced to find AI partners.

Table.1. Newborn sex ratio in 1998-2002 China

Years	Sex Ratio of the Newborns
1998	117.02
1999	123.44
2000	119.79
2001	130.13
2002	125.17

Moreover, males and females provided different reasoning for the question, “what is the reason to find an AI partner?” 49% of the females believed it was the sexual desire that caused people to find AI partners, whereas 71% of the males held the same belief. The outcome accorded with the former study of the different perspectives towards relationships from two genders, which indicated that males had more sexual desire and value the role of sex in the relationship [8].

6. Application

The problem of the imbalanced sex ratio in China needs to be considered by society. The unequal population of females and males in China and other parts of the world may already impact teenagers' thoughts and beliefs. Some youth males are not willing to make social contact with females. They may start to find AI partners as substitutes for human partners when the latter is available to the public. It is significant for society to encourage them to communicate and get acquainted with others.

On the other hand, AI partners do have advantages in satisfying biological needs and possible emotional needs for people. According to Levy, who is an expertise in artificial intelligence, both male and female start to find strangers to have sex despite of the possibility of transmitting disease [8]. Therefore, a robot which is programmed can avoid these problems and provide more pleasant experience for people. Another article concludes that love relationship is an essential feature in human life, and if one cannot find a real human being to have romantic relationship, it will be beneficial for them if there is a robot which understands love [2]. As a result, AI partners are still worth resources to develop to offer advantages for people in the future.

Understanding relationship between human beings and robots would be easy with the help of scientists. In an article, one writer suggests that we can initiate human-robot relationship through a kissing machine [9]. People could produce a kind of emotion through the interaction with a virtual character through kissing. In some cases, when discussing the influence made by physical and psychological distances, scientists questioned about the importance of sex in relationships between human beings and robots. Human beings sometimes would fall in love with how they have sex with. In this circumstance, would human beings love a robot if they have sexual relationship with each other [10].

Scientists tried to let users assume some differences between male and female robots, which would create a gendered humanoid robot for human beings [11]. Physically, human beings and robots are totally different, psychologically, human beings are hard to construct mental empathy with robot due to the distance between [12]. On the contrary, according to scientific researches, human beings do have unconscious mind when they think of robots. Though they are machines, people still can easily start to treat some robots like real lives [13], which means the AI partners are really something.

Moreover, suppose technology companies want to profit from the AI sector. In that case, the robot partners need to provide the same or even better sexual function with users than real humans, as many people consider this aspect necessary. Developing more female robot partners can help companies profit because more males will be considering having a romantic relationship with AI robots in the future. However, developing AI robots that can satisfy female users will also be a possible strategy. For robot partners, people may have the stereotype that they are designed for males to satisfy their

sexual desire. Nearly all the available sex robots on the market are female robots. As a result, the demands of female users are ignored. Although more males accept AI to become their partners, there are many females also considering having AI partners in the future.

7. Conclusion

In this research, the views of Chinese youth toward AI romantic partners are analyzed and compared. Overall, a big portion of the Chinese youth are not considering having an AI partner in the future. However, there are still a significant amount of people that would like to have such a love affair. To compare the differences in the inclination between two sexes, specifically, the survey's results prove the hypothesis that Chinese male youths are more likely to have a relationship with AI robots. The results also show males have a greater tendency to expect reproduction from AI. Males are more likely to believe that sexual desire is the key factor that cause people to choose AI as a romantic partner. These results suggest that the sex ratio of the AI demanders may be related to the newborn's imbalanced sex ratio in the 1990s and 2000s in China, which causes pressure and difficulties for males to find a human partner. The results also conform to the theory of the colors of love, which shows ludus is a kind of love attitude. Males are focusing more on the visual and sexual attraction in one relationship based on their answers.

However, there are also some limitations to this research because of the small sample size and the method. The sample of about 100 people might not represent the total population of youths in China. This sample does not include every province in China but mostly includes two to three provinces. Therefore, the region is limited. Additionally, using surveys as a method to collect information does have disadvantages. For example, it is tough to know the respondents' feelings or emotions when they are answering this survey. Survey also lacks personalization since everyone answers the same questions despite their characteristics and backgrounds. People might also be dishonest when they are answering multiple questions. Nevertheless, overall, this survey has provided useful information to analyze how males view AI partners.

This research not only suggests that more female AI should be designed but also makes people realize there are different forms of intimate relationships and different understandings of love. Although robots' technology will continue to improve in the future, robotic lovers are hard to substitute real human beings entirely because they always lack physical and psychological features. Chinese male youth may accept AI romantic partners more than females. However, humans and robots' intimate relationship will allow people to discover themselves and understand love differently. Also, even if one person accepts having a romantic relationship with robots, they still face societal views and pressure. As shown in the results, most of the respondents refused to have a romantic relationship with AI. Therefore, the intimacy between robots and humans will be a debatable question for now and the future.

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