

Internet use influences digital empathy: a survey on Chinese young adults

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Abstract. With the development of science and technology, the Internet occupies more time in daily lives and changed our life from all aspects. Empathy, an important factor for human interaction that is usually considered to improve socializing, is also affected by Internet use. By surveying 193 Chinese adults about their online habits and empathy levels through Davis Empathy scale. We found that the time spent surfing on the Internet, especially the time spent on entertainment, is positively correlated with digital empathy, while playing video games negatively affect people's empathy ability.

Keywords: empathy, internet, adult, fantasy, self-oriented.

1. Introduction

Empathy is the “reactions of one individual to the observed experiences of another (Davis, 1983).” Having a certain degree of empathy can benefit people from many aspects. For example, it has been proven that high levels of empathy operate more efficiently as to the fulfillment of their role in eliciting therapeutic change that empathetic health care workers comprehend the needs of the health care users, as the latter feel safe to express the thoughts and problems that concern them (2020). Other than benefiting the specific expertise such as health care or psychological therapies, high levels of empathy also improve the human communications, tighten human interactions, and promote the prosocial behavior (Stiff, et al, 2009). However, the empathy levels among the population are not constantly shown in a high level, instead, it highly depends on both biological, psychological, and environmental factors. Research by John A. et al (1983) suggested a structure of empathy formed by 4 factors: social self-confidence, even temperedness, sensitivity, and nonconformity. The self-assessment in empathy scale is highly correlated with the 4 factors. Besides, genetic factors, and environmental factors, as well as their joint interplay, also have large influence on empathy variations among the population (Knafo & Uzefovsky, 2013).

Different levels of empathy may bring different outcomes for our daily activities, especially in communications. Nevertheless, the relationship between empathy and communication is not unidirectional (i.e. the empathy level affects the communication), instead, they interact with each other. Communication dramatically influences altruistic behavior, and appears to largely work by heightening empathy (Andreoni & Rao, 2011).

In the social field, the communication between people is more harmonious with high level of empathy (Mark V. Redmond, 1989). In the past when communication technology was not developed in the past, people could only experience empathy when they communicated face-to-face in reality. However, with the development of technology and the increase in the use of electronic products, the Internet provides many ways for people to communicate with others. Different from face-to-face communication, the online communication/interaction can be bidirectional such as online chatting, as well as unidirectional such as commenting on social media, YouTube, and so on. The change of the way people communicates from face-to-face to Internet has a dramatic influence on our daily life.

The increasing use of the Internet has brought new research questions, as described by Marín-López (2020) that empathy, highly used in informal communication, have been found to be important components of face-to-face interpersonal interactions may also play an important role in prosocial versus antisocial interaction online. The empathy shown in online activities is called digital empathy and it enables people to experience empathy via online communities, social media. The digitization of health care and the corresponding decrease in the expression of empathy may be cause for concern

(Terry et al., 2016). According to past research, differences in how the Internet is used can lead to differences in empathy, for example, the use of violent games, gory movies may lead to less empathy in people's lives (Carrier et al, 2015). However, different voice raised from Jing et al. (2022) that online violent video games would decrease empathy while online prosocial video games could promote empathy. Other than video games, SNS use was also found significantly and positively related to affective empathy though only marginally related to cognitive empathy (Guan et al, 2019). Not only the type of Internet usage can affect empathy, but the frequency of Internet access may also lead to a decline in empathy.

Though much research has been conducted to examine the effects of Internet use on empathy change, conflicting results were observed (as abovementioned). This is probably due to the diversity of online activities and the difference of people's Internet use habits and goals. Whether Internet use increase or decrease the digital empathy level and how it causes the effects remains unsolved.

To answer this question, especially to examine the digital empathy levels of Chinese adults, who account for a large proportion of the population and most of them have certain social experience, we conducted an online survey to evaluate their Internet use activities and digital empathy level to understand and explore the factors that determines Chinese adults digital empathy.

2. Methods and materials

2.1. Participants and procedures

A total of 191 adults from across China (N=84 male, age =18 to 60, N = 107 female age =18 to 60 held junior college or undergraduate degrees) took part in an online survey conducted at a free-charge online survey platform <https://www.wjx.cn/> to measure people's digital empathy levels and their Internet use habits. All the surveys were done with the consent of the participants. All datasets were collected in August of 2022.

2.2. Measures

The survey contains 38 questions in total, with 3 questions regarding the demographic information, i.e. gender, age, and educational level, and 7 questions investigating participants' Internet use habit, and 28 questions adopted from the Davis Empathy Scale to measure the participants' empathy levels while using Internet.

For the questions of the Internet use (See Appendix 1 Items 4 to 10), we asked the participants regarding the time they spent on the Internet every day, and the main activities they spent the time on, such as playing video games, social media, browsing, and so on, as well as their attitudes towards and dependence on the Internet.

Another important part of the survey measured people's ability to empathize (see Appendix 1 Items 11 to 38). In this part, we adopted the Davis Empathy Scale and instructed the participants to rate their empathy levels under the situation of using Internet. The Davis empathy scale has been repeatedly verified and validated by many researchers (Fernandez., et al). It mainly measures whether the participants could "empathize" with others and whether they could consider problems from other's side. It contains 27 statements in total that are categorized into four dimensions, including the fantasy scale (refer to items 11,15,17,22,26,33,36 in Appendix 1) which measures respondents' tendencies to transpose themselves imaginatively into the emotions and actions of fictitious characters in books and movies, perspective taking scale (refer to items 13,18,21,25,31,35,38 in Appendix 1) measuring the tendency to spontaneously adopt others' psychological perspectives, empathy concern scale (refer to items 12,14,19,24,28,30,32 in Appendix 1) assessing "other-oriented" feelings of sympathy and concern for unfortunate people, and personal distress scale (refer to items 16,20,23,27,29,34,37 in Appendix 1) measuring "self-oriented" feelings of personal anxiety and restlessness under tense interpersonal situations. For each statement, participants were asked to assess themselves from 5 levels ranked from 1 (completely inconsistent) to 5 (completely consistent) to determine whether the description fitted them or not. It should be noted that the questionnaire also included reverse questions

(Items 13,17,22,23,24,25,28,29 in Appendix 1) in order to avoid fatigue from continually seeing questions with high similarity. The scores of these questions should be reversed during analysis.

2.3. Statistical analysis

The statistical analysis was implemented in SPSS. After collecting sufficient datasets, we calculated the reversed scores for reversed questions by subtracting the original score by 6. After that, we summed the scores after reversing of the four dimensions of the Davis scale respectively. Then, the univariate ANOVA was applied to examine the effects of Internet use on each empathy dimension. This was done for each question about the Internet use, we considered it as a factor and the options are the levels of the factor. Additionally, we calculated the time spent on entertainment for each participant by multiplying the scores of items 4 and 5, and conducted Pearson's correlation between the multiplied score and each empathy dimension to examine the interactions between entertainment time in the Internet and digital empathy.

3. Result

3.1 ANOVA

The univariate ANOVA using the factor from Item 5 measuring the frequency of online activities related to entertainment revealed a main effect on the empathy concern ($F=2.76$, $p=.02$). Fig.1 shows the empathy concern levels of each group of different frequencies using Internet for entertainment that with the increase of the proportion of entertainment time of the subjects, the empathic concern scale of the subjects presents an overall trend of firstly decreasing and then increasing, in which, the minimum value is reached when the proportion is 50%-70%. The post-hoc LSD shows that when the entertainment proportion is less than 10%, there is a significant difference in empathic concern scale between 10%-30% ($p=.007$) and 50%-70% ($p=.003$), respectively. When the entertainment proportion was 50%-70%, there was a significant difference in empathic concern scale of the subjects over 90% ($p=.043$).

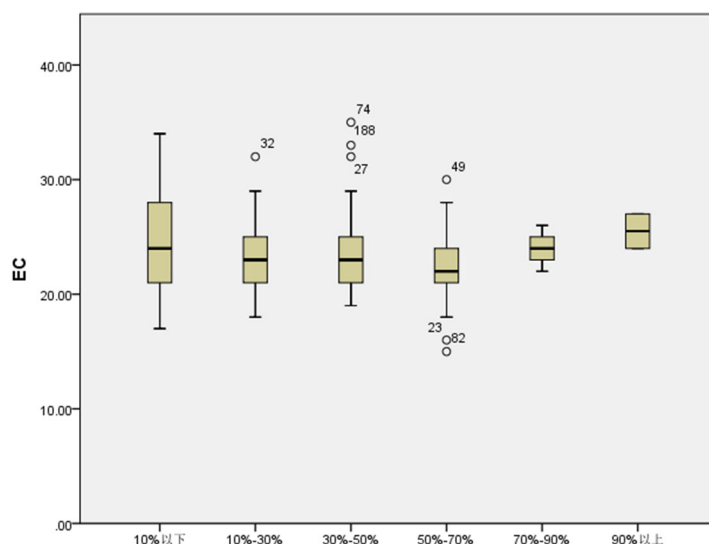


Figure.1 what is the percentage of recreational use

The univariate ANOVA using the factor from Item 4 the time spent on Internet use also showed an effect of the time spent on Internet use on empathy concern that the empathy concern level monotonically increases with the time of Internet use. However, the effect is only marginally significant ($F=2.61$, $p=.053$).

Table 1. Statistics

	Quadratic sum	df	Mean square	F	P
Between groups	86.505	1	86.505	7.238	.008
Within group	2258.930	189	11.952		
Total	2345.435	190			

or the factor related to Item 8 regarding whether the subjects play online games, the univariate ANOVA revealed a significant effect of it on the empathy concern level ($F=7.24$, $p=.008$). Fig.2 illustrates the empathy concern scores of three groups regarding playing computer games showing that people playing computer games have lower empathy concerns than these not playing computer games.

The 3 factors did not show any effect on other dimensions of empathy, and all the other factors related to Internet use did not show any effects on any dimensions of empathy (all $p>.05$).

3.2 Correlation

The Pearson's correlation analysis showed a strong positive correlation between the time spent on entertainment online content and the personal distress dimension ($r^2=.17$, $p=.023$). This result shows that a person spending more time on entertainment online content tend to have higher personal distress. No significant correlation between the time on entertainment online content and other empathy dimensions was observed (all $p>.45$).

4. Discussion

In the current study, we examined how Internet use among Chinese adult affects their digital empathy through an online questionnaire surveying their Internet use habits and purposes, as well as their empathy levels in online situations from 4 dimensions. The results showed that to a certain degree Internet use affects Chinese adults' digital empathy level, but the effect was not monotony, instead, it varies with different types of the online activities and the time/frequency spent on these activities, and the effects of Internet use are not consistent for all dimensions of empathy.

The univariate ANOVA results shows a significant effect of playing computer games specifically on empathy concern but not the other three dimensions. Specifically, lower empathy concern levels were observed in gamers rather than non-gamers. In other words, the participants had the lowest EC when they played the game occasionally, and the highest EC when they didn't play at all, that is to say, whether a person plays online games regularly or occasionally, their ability to empathize decreases and lack of pity to others. This may be because many of today's big online games require players to hurt others, and being empathetic (i.e. tending to think or act in other's shoes) stops the players attacking competitors. Therefore, suppressing or getting rid of the empathy concern as part of the game criteria may train these players to increase aggression to perform better achievement in games. On the contrary, people who don't play video games, because they haven't been trained to do so, have higher levels of empathy. In most cases, perspective-taking is not involved in games. Regarding the other three dimensions that were not affected by playing games, it could be that the gamers only need to experience the characters they operate, especially they are required to immerse in the character, which means they should not consider others' perspective, thus the dimension of perspective-taking was not affected. Regarding the fantasy scale, although the characters in games lead some fantasy to the gamers, but the fantasy experience is not a unique experience that only emerges from games. Non-gamers can also transpose themselves into the emotions and actions of characters through fictions, movies, and so on. Therefore, the effect of playing games is not necessary to differentiate from not playing games regarding the empathy dimension of fantasy scale.

Digital empathy concern is not only affected by playing games, but also by the time we spent on the Internet and the percentage we spent time on the entertainment content. However, different from the effect of playing games, the effect of time and percentage on entertainment content is more complicated. In general, the more time people spend on Internet, their empathy concern is higher. This might be because the Internet use time indirectly reflects the online socializing, communication, or interactions with or without other people. As Andreoni & Rao (2011) suggested that face-to-face communication and human interactions promotes altruistic behavior and heightens empathy, communications and interactions online might show the similar effects as the face-to-face communications. However, we cannot draw a clear conclusion from it yet since the time distributed to different types of online activities were unknown to us.

Nevertheless, the percentage of time spent on entertainment influences empathy concerns but not monotony. Fig.1 shows a W shape, which means that the difference in entertainment proportions and empathy are not linearly related. Both very much and very little online entertainment have a greater impact on people. This means that rarely or often browsing entertainment content have a greater impact on people, while moderately paying attention on the entertainment content does not have a significant impact on people. In the process of analyzing the data, in order to better understand the relationship between entertainment use time and empathy, we calculated the time on entertainment and correlated it with different dimensions of empathy. The result shows no correlation between time on entertainment and the empathy concern, which proved that the effect of entertainment-related Internet use on empathy is not monotony. Importantly, the entertainment use time is positively correlated with the personal distress dimension, which means that the more entertainment use time, the higher the personal distress level. This may be explained that when the subjects feel anxious about interpersonal relationships in their daily life, they may be more inclined to browse the entertainment content to relieve their pressure.

Though no effect was observed in other Internet use aspects, some tendencies can be detected from the results. For example, the Item 6 measuring the frequency of use of social media shows that too much and too little use of social media is not strongly associated with PD, while appropriate use of social media is strongly associated with PD. For EC, Only less and more use of social software will affect EC, and there is no correlation with EC when it is usually moderate. For FS, only spending a lot of time on social software will affect this ability. For PT, both no social media use and heavy use of social media have a strong positive correlation with PT, but moderate use has a very low correlation with PT. Across the four dimensions of the question, empathy is only associated with the frequency of social networking online for those who use the Internet a lot and those who use the Internet very little. This may suggest that rational online socializing does not lead to changes in empathy, whereas over-reliance on online dating and not following people online at all may affect one's ability to empathize. The former may be because real life is stressful, while the latter may be because real life is rich, social networking does not depend on the Internet, and therefore is not affected by online empathy in this respect.

5. Conclusion

Empathy plays a great role in harmonious communication between people. With the progress of mankind and the development of technology, empathy also needs to become digital to meet the needs of the times. Through this investigation of the influence of the Internet on digital empathy, the results show that the empathy concern is the dimension that is easily affected by Internet use habits and the influence on it is diverse depending on the types of online activities and time or frequency spent on these online activities. More specifically, when a person plays games infrequently or moderately, their empathy concerns are significantly higher than people playing games. However, when a person spends a lot of time playing a game, his empathy for others decreases, which may be due to the violent and brutal scenes in the game and the realistic depiction of human nature that erodes the player's heart and leads to a more cold-blooded personality. Research has also shown that the proportion of time

spent in recreation is strongly correlated with personal distress. According to the definition of PD, personal distress is often the result of negative life experiences, and therefore may be caused by one's own life stress. Under the circumstances of great mental stress, people may wish to vent their emotions by means of entertainment on the Internet.

Though the current study depicted the digital empathy among Chinese adults, a few limitations should be drawn. First, due to relatively low sample size we collected under a time pressure, as well as the diversity of participants' backgrounds of age, gender, educational level, and other unmeasured factors, our results may not apply to all Chinese populations. Therefore, the future study can enlarge the sample size and targets on groups with a certain background to have a specific understanding of their digital empathy. Second, as a cross-sectional study, the current study did not show whether the variety of digital empathy among Chinese adults is caused by or changes with the Internet use habits. Further longitudinal studies can be conducted to investigate the causes of digital empathy change in the digital age by following the change of people's Internet use habit and digital empathy levels.

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Appendix 1

The Internet Age and the Empathy Questionnaire

Hello, thank you very much for supporting our research. This scale is an Internet empathy survey. There are 38 questions in this scale. Please read each question carefully and do not hesitate to consider how much the statement fits your situation and then choose an appropriate number from 1 to 5. Please note that the higher the number, the better the description fits your situation.

1. Gender

☐Male ☐Female

2. Age

☐Under the age of 18 ☐18-25 ☐26-30 ☐41-40 ☐41-50 ☐51-60 ☐More than 60

3. Record of formal schooling

☐Junior high school

☐High school

☐Specialized subject

☐Undergraduate course

☐Master's degree

☐PH.D

4. Average time spent surfing the Internet per day

☐Less than 1 hour

☐1-3 hours

☐3-5 hours

☐Basically anytime, anywhere

5. How much of this is for entertainment?

☐Under the 10% ☐10%-30% ☐30%-50% ☐50%-70% ☐70%-90% ☐More than 90%

6. How often do you use social software (such as wechat and QQ)?

☐Yes, but mainly for work

☐High, work use, daily also very commonly used

☐General frequency of use

☐Low frequency of use

7. Do you usually play video games to relax?

☐Don't play ☐Occasionally ☐Often

8. Do you play large online games

☐YES ☐NO

9. What do you play video games for?

☐Nothing can be done

- Relax the pressure
 - I want to play with my friends
 - When the mood is irritable to relieve
 - Fill in the pieces time
10. What is your attitude towards the Internet?
- The dependence is light, just for fun
 - Dependence is general, available can not be used
 - More dependent, can not be used for a long time
 - Very dependent, a day or two without the Internet will be uncomfortable
11. I daydream and fantasize, with some regularity, about things that might happen to me. (FS)
12. I often have tender, concerned feelings for people less fortunate than me. (EC)
13. I sometimes find it difficult to see things from the "other guy's" point of view. (PT) (-)
14. Sometimes I don't feel very sorry for other people when they are having problems. (EC) (-)
15. I really get involved with the feelings of the characters in a novel. (FS)
16. In emergency situations, I feel apprehensive and ill-at-ease. (PD)
17. I am usually objective when I watch a movie or play, and I don't often get completely caught up in it. (FS) (-)
18. I try to look at everybody's side of a disagreement before I make a decision. (PT)
19. When I see someone being taken advantage of, I feel kind of protective towards them. (EC)
20. I sometimes feel helpless when I am in the middle of a very emotional situation. (PD)
21. I sometimes try to understand my friends better by imagining how things look from their perspective. (PT)
22. Becoming extremely involved in a good book or movie is somewhat rare for me. (FS) (-)
23. When I see someone get hurt, I tend to remain calm. (PD) (-)
24. Other people's misfortunes do not usually disturb me a great deal. (EC) (-)
25. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. (PT) (-)
26. After seeing a play or movie, I have felt as though I were one of the characters. (FS)
27. Being in a tense emotional situation scares me. (PD)
28. When I see someone being treated unfairly, I sometimes don't feel very much pity for them. (EC) (-)
29. I am usually pretty effective in dealing with emergencies. (PD) (-)
30. I am often quite touched by things that I see happen. (EC)
31. I believe that there are two sides to every question and try to look at them both. (PT)

32. I would describe myself as a pretty soft-hearted person. (EC)
33. When I watch a good movie, I can very easily put myself in the place of a leading character. (FS)
34. I tend to lose control during emergencies. (PD)
35. When I'm upset at someone, I usually try to "put myself in his shoes" for a while. (PT)
36. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me. (FS)
37. When I see someone who badly needs help in an emergency, I go to pieces. (PD)
38. Before criticizing somebody, I try to imagine how I would feel if I were in their place. (PT)