An Analysis of the Research on “Psychological Typhoon Eye Effect” in COVID-19

Chun-hua SHI\textsuperscript{1,a,*} and Bao-jun WANG\textsuperscript{2,b}

\textsuperscript{1}School of Administration, Hohai University, Nanjing, China

\textsuperscript{2}Institute of Earth Science and Engineering, Nanjing University, Nanjing, China

\textsuperscript{a}chunhuashi828@sina.com, \textsuperscript{b}baojun@nju.edu.cn

*Corresponding author

Keywords: COVID-19, Anxiety, Mental health.

Abstract. COVID-19 is a global public health emergency, which has a great and far-reaching impact on all aspects of the world. So far, it is not over, with a lot of uncertainty, which greatly increases the social risk. “Psychological typhoon eye effect” was put forward by Shu Li(2009) to describe the anxiety level of people at different spatial distances from the disaster area, the farther away from the disaster area, the higher the anxiety level of people. Two surveys have found that this effect does exist in COVID-19. It was argued that it is of practical significance to study people's psychological panic in COVID-19 from the perspective of the psychological typhoon eye effect. However, the psychological typhoon eye effect is only an analogy, and the cause or mechanism of its occurrence is not clear. Therefore, future research, especially in the context of COVID-19, should further study its implication and mechanism.

1. What is the Psychological Typhoon Eye Effect and its Research Significance

Since the late 1970s, western scholars have observed an interesting phenomenon, that is, the closer to the place where the disaster occurs, the lower the level of people's anxiety; the closer the time to the disaster, the more calm the people's emotions and feelings. After the Wenchuan earthquake in 2008, Chinese scholar Shu Li and his team conducted a large-scale investigation on the residents in the disaster area and non-disaster area. They found that the closer to the disaster area, the more calm people were. Moreover, this phenomenon still existed after 1 month, 4 months and 11 months after the earthquake. Therefore, the term "psychological typhoon eye effect" was created in meteorology to describe this phenomenon[1]. The psychological typhoon eye effect has been proved by space distance [2] and time distance [3] in the influence of SARS on Chinese people's mentality in 2003.

Concerning the research significance of psychological typhoon eye effect, as Noah gray, senior editor of Nature, pointed out, the research on it was helpful to predict the general response of people after emergency crisis. He also warned investigators to be cautious and skeptical when interviewing survivors and assessing post disaster assistance, because the information provided by victims may be affected by this psychological effect [4]. In other words, under the influence of major emergencies, people's understanding and feeling of disasters show obvious subjectivity. At the same time, different from people's general or assumed conjectures, people in disaster areas tend to show less stress response to risk, while people in remote places from disaster areas have higher stress response. It’s very necessary and meaningful for social governance to understand the psychological typhoon eye effect in disasters.
2. Empirical Studies on the Psychological Typhoon Eye Effect in COVID-19

COVID-19, which broke out at the end of 2019 and the beginning of 2020, is a long-lasting and highly infectious new disease that is sweeping the world. So far, it has not been seen when and how it will end. Since COVID-19 was first prevalent in Wuhan, China, Chinese psychological workers have investigated the impact of COVID-19 on people's mental health based on the epidemic situation in Wuhan. Among them, two studies have been published to verify whether the epidemic situation in Wuhan has produced the psychological typhoon eye effect.

In one study, it referred to an online survey on the risk perception and anxiety of COVID-19 among more than 2000 people in many provinces and cities of China during the period from one month to one and a half months after the lockdown of Wuhan city. The results showed that when people were asked to infer the anxiety of Wuhan residents and the number of psychological consultants and doctors they needed, whether the logarithm of objective physical distance, the risk level of the investigated participants' residence or the subjective psychological distance as the distance index, all showed that the farther away from the risk occurrence place, the degree of concern for Wuhan residents higher. In other words, the psychological typhoon eye effect appeared in this study[5].

In the second study, conducted about a month after the lockdown of Wuhan, 351 people from all over the world, including China, were surveyed. The results showed that the foreign participants were more afraid or worried about the epidemic situation in Wuhan than the domestic subjects. Specifically, foreign people estimated that the highest price Wuhan residents were willing to pay for masks was obviously higher than that the domestic people's estimate (but the difference didn’t reach the level of statistical significance. Also It was estimated that the number of days of delaying the start of school for primary school and secondary school students, college students in Wuhan. It was found the estimation was longer for foreign participants than for Chinese participants. Moreover, if the risk level of the region where the subjects live was considered, it showed when the risk level of their own residence increases, the risk perception of Wuhan epidemic will decrease [4]. Therefore, the psychological typhoon eye effect has also been verified in this study.

To sum up, the above studies were conducted in the early stage of COVID-19. At that time, the epidemic situation in Wuhan has not been well controlled, and the epidemic has spread in other provinces and cities in China, although it was not very serious while the epidemic situation in western countries and other overseas countries has begun to break out. Both of them adopted the bystander's angle, that is, the subjects were required to estimate or infer the anxious feelings and actions of Wuhan residents in the epidemic situation, rather than let the subjects report how they themselves felt sad or hopeless. Both of them verified the psychological typhoon eye effect.

3. How to Explain the Psychological Typhoon Eye Effect in COVID-19

According to Fangfang Wen and her colleagues, there are four theories to explain the psychological typhoon eye effect, namely: (1) cognitive dissonance; (2) mere exposure effect; (3) individual experience; (4) social amplification framework[5].

First, according to the cognitive dissonance theory, Wuhan residents were greatly threatened by COVID-19. They were more likely to have the perception that their places of residence were more unsafe. However, due to the lockdown of the city, they could not choose to live elsewhere at will. In
this way, the pressure of cognitive dissonance could be generated, and they might choose to change their cognition of the environment. This theory sounds reasonable, but the two studies didn’t test directly whether residents in Wuhan and residents in other high-risk areas really had this cognitive dissonance. In fact, it is difficult to test this hypothesis [4].

Second, according to the theory of mere exposure effect, Wuhan residents might reduce their risk cognition or anxiety because they have been exposed to high-risk environment for a long time, resulting in habituation or adaptation. However, just the habit of experience may not produce psychological immunity [4]. Therefore, whether mere exposure effect will occur or not varies from person to person, and whether it can be regarded as a universal explanation mechanism needs further study to verify.

Third, according to the theory of individual experience, Wuhan residents had more direct experience on COVID-19 than residents in lower-risk or risk-free areas. The latter relied mainly on media reports to obtain information about the epidemic situation in Wuhan. Obtaining direct experience is conducive to eliminating the panic caused by vague information, thus buffering or reducing anxiety. It can be seen that, according to this interpretation, the psychological typhoon eye effect is inevitable, but to a certain extent, it depends on the media's objective and timely reporting of the epidemic situation in the disaster area. As long as the media management is done well, the psychological typhoon eye effect may be reduced to a certain extent.

Fourth, according to the social amplification framework theory, the information of epidemic situation in Wuhan tended to be amplified after being publicized and reported by formal and informal media. Wuhan residents could correct these amplified risk information and reduce their anxiety due to their direct experience.

It can be seen that the fourth explanation is basically consistent with the third explanation, that is, if the propaganda and reporting of the epidemic situation in Wuhan was improved, especially keeping the objectivity and timeliness of the report, the panic of residents outside the disaster area might be effectively reduced.

4. Further Thinking on the Psychological Typhoon Eye Effect in COVID-19

4.1. What are the Advantages and Limitations of Understanding COVID-19 with the Perspective of Psychological Typhoon Eye Effect

Covid-19 is a sudden major public health event, which has being produced a significant impact on all aspects of the global economy, politics and culture, and this impact is also unpredictable to a large extent. Therefore, its disturbance to social psychology is worth studying. It is obvious that the perspective of psychological typhoon eye effect in studying the social psychology of COVID-19 has some advantages. But some limitations are also worthy of being noticed.

The advantages are as follows:

(1) According to the hypothesis of psychological typhoon eye effect, it is reasonable to shift the research focus from the people's mental health level in the high risk area (such as Wuhan and other high-risk cities in China and other foreign countries) to that of the residents in the low risk area, at least the latter is also worthy of attention, so as to better grasp the psychological impact on the whole society concerning the disasters. With the spread of COVID-19, we are more and more
confident that the epidemic has had a very important impact on the social psychology of almost every countries in the world.

(2) The psychological typhoon eye effect suggests that there is panic among the people in the non-disaster areas. Therefore, the objectivity and accuracy in the release of epidemic information should be paid attention to, and rumors should be timely refuted. In other words, the psychological typhoon eye effect provides a social governance scheme to influence social psychology from the perspective of media publicity. In fact, on the whole, the Chinese government has been very successful in media management and public education in the epidemic situation in Wuhan and its spread in China.

(3) The psychological typhoon eye effect also suggests that the level of anxiety of the people in the disaster area is too low. Therefore, it is also the responsibility of the government and relevant departments to carry out social governance by reminding residents in high-risk areas to maintain an appropriate level of tension and alertness (such as informing them of the objectivity of danger through propaganda and so on). The lockdown of Wuhan city itself shows that the government attaches great importance to the epidemic situation in Wuhan, and it is a reminder to Wuhan residents to be vigilant and to maintain moderate anxiety.

Although studying the social psychology of COVID-19 from the perspective of the psychological typhoon eye effect has the above advantages, there are also some shortcomings that cannot be ignored. The main points are:

(1) Psychological investigation often depends on data. However, it is not easy to judge what variables or indicators are appropriate to measure people's anxiety level. Once the indicators are not selected properly, they may not be possible to verify the psychological typhoon eye effect. For example, the research by Mingxin Xv and his colleagues asking subjects to judge how high Wuhan residents are willing to pay for masks (0-1000 yuan) as one of the indicators of anxiety [4]. In fact, foreign subjects may be unfamiliar with the behavior of wearing masks, or they are not clear about the price of masks in China, and may involve the conversion of RMB and foreign currency. Therefore, their research did not find significant differences between foreign and domestic subjects on this issue. In other words, the indicators designed there may not be appropriate.

(2) In meteorology, the phenomenon of typhoon eye has clear causes, but in psychology, the formation mechanism of the psychological typhoon eye effect is not clear. There are many possible reasons, and each reason may be contradictory and cannot be fully explained. For example, when a disaster occurs, some residents in the disaster area can adapt quickly and reduce their anxiety level, but others may maintain a high level of anxiety in a relatively long time. In other words, the above theoretical explanation of mere exposure effect may not be applicable to some subjects.

(3) The psychological typhoon eye effect is only a rough analogy. Researches usually fail to verify people's anxiety level showing a dynamic trend of increasing with the distances. The studies may even find that people's perception of risk is the lowest at a medium distance (i.e., neither very close nor far away) from the disaster area, which is "marginal zone effect", and the phenomenon that people's risk cognition concerning the unpredictability and severity of the risk does not change with the distance from the disaster area, that is, the phenomenon of "psychological controllable threshold" [5]. All these indicate that the perception and judgment relating to anxiety does not follow the psychological typhoon eye effect when disasters occur.
4.2. What is the Essence of the Psychological Typhoon Eye Effect in COVID-19

Based on the review of the above two empirical studies, as well as the analysis of their advantages and disadvantages, we must further consider what the essence of the psychological typhoon eye effect is.

The psychological typhoon eye effect is relative to the bystander angle in the research methods. The above empirical studies both took the bystander angle. One of the reasons for using this angle is to reflect more objectively the attitude of the subjects towards the epidemic situation in a certain sense. Because if the participants are asked to report their own feelings about the epidemic, they may exaggerate or reduce their reactions due to some intentional or unintentional motives. Common motivations include arousing others' attention, catering to the expectations of society. However, taking the bystander angle requires the subjects to have empathy will and ability, and also involves systematic attribution bias to selves and bystanders. For example, when subjects were asked to infer the level of anxiety among Wuhan residents, they might seek the reasons for the difficulties of Wuhan residents. Affected by internal attribution, it was easier for them to believe that Wuhan residents have produced a bad psychological state and need more help from doctors and psychological counselors. Therefore, the bystander's angle cannot guarantee that the subjects' answers are objective either. The subjects' empathy ability and willingness, as well as attribution bias will affect the objectivity of the research results.

Studies at home and abroad have found that in different disaster events, it is not always possible to verify the psychological typhoon eye effect, and it is more likely to verify the effect by using the bystander angle rather than the actor or self-angle. This shows that people generally have strong sympathy for others in the disaster. On the one hand, people may be more willing to help others, and on the other hand, they themselves may be flustered or upset. Mingxin Xv and his colleagues held that the psychological typhoon eye effect essentially depicts the public's panic and behavior in major emergencies [4]. There is some truth in this view, but it is not absolutely right.

As mentioned above, even if the bystander perspective is adopted, if the selected anxiety index is not appropriate or the risk cognitive variables are included, the effect may not be verified[4-5].

To sum up, the appearance or verification of the psychological typhoon eye effect may be affected by the subjects' personality characteristics, the factors of the event itself, and the attribution characteristics of human beings. It is also affected by the researchers' inquiry or measurement contents and methods. Therefore, the mechanism behind the psychological typhoon eye is very complex and difficult to generalize.

As far as the psychological typhoon eye effect in COVID-19, two empirical studies found that referring to the estimation of Wuhan residents’ anxiety, the anxiety level Wuhan residents felt is lower than that judged by the people not living in Wuhan. Once again, we really don't know how to explain this result. Because the possible reasons haven’t been thoroughly studied or tested. In other words, the psychological typhoon eye effect in COVID-19 does not seem to tell us any definite information about the anxiety of the people in the disaster area and the panic of the people in the non-disaster area. This means that future research must include the causes or mechanisms behind the psychological typhoon eye effect.
References


