

The Influence Mechanisms of Chinese College Students' Individual Cognitions on Their COVID-19 Pop-Science Transmission Behaviors on Social Media

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Abstract

This study explores what specific factors might influence Chinese college students' information transmission patterns on COVID-19 pop-science in China. Based on the risk perception theory and the situational theory of problem solving, an influence mechanism model of health information transmission behaviors online was constructed. This study investigated the public's information transmission behaviors of a particular type of health information on social medias during this global public health emergency, and on, specifically, why and how health information were transferred.

Keywords

Influence mechanism; COVID-19 Pop-Science; Social media; Information transmission behaviors; Perception of risk; Situational theory of problem solving.

1. Introduction

Since March 11th, on which the director general of WHO officially announced COVID-19 as a pandemic, measures have been taken by numerous channels to decelerate the spread of the novel disease. Disseminating accurate information about COVID-19 is essential in order to encourage individuals to follow prevention measures and to put them into action. Individuals, especially college students, use social medias to acquire, transmit and exchange popular science about COVID-19 at an unprecedented scale [1].

However, a few researches have studied about the why and how individuals transmit health information. Based on the perception of risk and the situational theory of problem solving, this research explores the transmission mechanisms of health information on social medias, and analyzes how the users' psychological cognition and information transmission behaviors are related in a global health emergency.

2. Literature Review

2.1. Social Media Use in China During COVID-19 Outbreak

During this pandemic, Weibo and WeChat were chosen as the social media this research will be mainly focusing on, due to their top usage rates in China [2]. A large portion of Weibo and WeChat users are college students. COVID-19 pop-science, including anti-pandemic knowledge and scientific protective measures, is largely spread and shared among all the contents relevant to COVID-19 on WeChat and Weibo. Conclusion can be drawn that public's primary focus during the COVID-19 outbreak is to understand more about the pandemic, and to know means of self-protection.

2.2. Perception of Risk

Risk perception, which is defined as an individual's cognition, attitudes and judgments on all kinds of external and objective risks [3], is an essential concept mentioned in almost all substantial theories investigating health behaviors [4]. The process of perception of risk is far more complex: simply realizing the existence of a health risk is not enough, individuals would have to regard themselves as personally at risk [5].

2.3. Information Transmission: Situational Theory of Problem Solving

Information transmission refers information's dissemination process. Two major actions are involved during information transmission: the acquisition and identification of information, and the filtering and sharing process; As both of them are equally significant, however, most of the current theories or models emphasized more on the former action instead of individuals' communicative behaviors.

This study introduces the public's situational motivation in problem solving, problem recognition, involvement recognition and constraint recognition in the Situational Theory of Problem Solving to explore the influence mechanism of COVID-19 popscience on the information transmission behaviors of Chinese-college-students social media users.

The Situational Theory of Problem Solving (STOPS) explores individuals' activated communicative activities when faced with problematic situations [6]. In the situational theory of problem solving, the audiences are conceived as problem solvers [7]. Several traits of this theory proved its applicability in the field of health communication. STOPS was incorporated in several researches to study subjects such as the predictions of information behavior and individuals' search on cancer- related information [8].

3. Model and Hypotheses

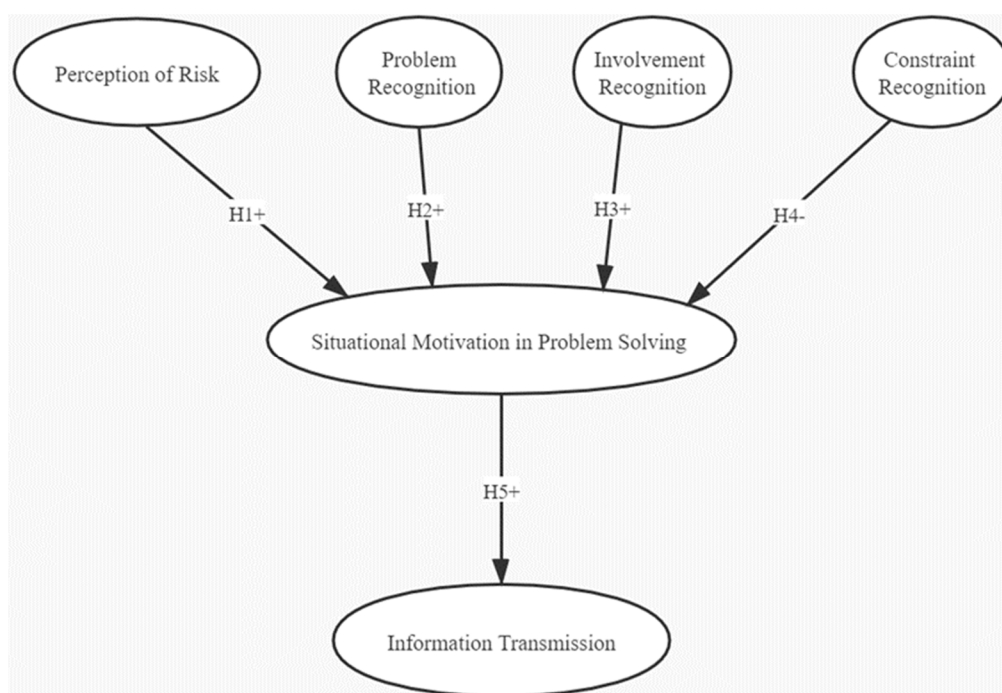


Figure 1. Research model

This study introduces the public's situational motivation in problem solving, problem recognition, involvement recognition and constraint recognition in the Situational Theory of Problem Solving to explore the influence mechanism of COVID-19 pop-science on the information transmission behaviors of Chinese-college-students social media users.

A model was constructed, and five hypotheses were proposed as follows:

Hypothesis 1: The situation motivation in problem solving of college student social media users are positively correlated with the perception of risk.

Hypothesis 2: The situation motivation in problem solving of college student social media users are positively correlated with the problem recognition.

Hypothesis 3: The situation motivation in problem solving of college student social media users are positively correlated with involvement recognition.

Hypothesis 4: The situation motivation in problem solving of college student social media users are negatively correlated with constraint recognition.

Hypothesis 5: The COVID-19 pop-science transmission behaviors of college student social media users are positively correlated with the situational motivation in problem solving.

4. Study Design

A web questionnaire survey was conducted among Chinese key university students from April 26th to May 5th. A trial-test of the scale was carried out first to examine reliability and validity of the scale. A total of 505 Chinese key university students participated in this study. We got a final valid sample of N = 325.

5. Procedure

Variables	Items
Risk perception	I am likely to be affected by COVID-19. It is very possible to me to be infected. Personally, I think once infected by the coronavirus, it is hard to be cured. I think the spread of COVID-19 is hard to be controlled.
Problem recognition	I think COVID-19 reflects a severe social problem. I treat the situation now very carefully. I think the COVID-19 pop-science information spread on social media could satisfy people's needs for information.
Involvement recognition	I realized that my life is very related to the pandemic. I think COVID-19 has impacted my life greatly. I am very related to the outcome of this pandemic.
Constraint recognition	If I got infected by COVID-19: to a great extent, I think I can take certain measures to avoid or slow down the exacerbation process. If I want to, taking certain measures can greatly reduce my possibilities of being infected. If I was infected by COVID-19, and if I want to, taking certain measures can avoid or slow down the exacerbation to a great extent. Although the COVID-19 pop-science spread on social media are not entirely reliable, I know how to avoid being infected.
Situational motivation	I want to learn more COVID-19 pop-science strongly. In order to decrease my possibilities of being infected, I learn COVID-19 pop-science.
Information transmission	On social media, I actively share COVID-19 pop-science. I must let my family and friends know about COVID-19 pop-science. I am very willing to participate in discussions relevant to COVID-19 pop-science. I am willing to spend time explaining COVID-19 pop-science to other people. I seek for opportunities for me to share my view on COVID-19 pop-science. I feel happy when I provide the latest COVID-19 pop-science to others. I am willing to participate in discussions relevant to COVID-19 pop-science anytime. When I hear others discussing COVID-19 pop-science, I will join the discussion.

Figure 2. Variables and items

SPSS 20.0 was used to conduct data analysis.

According to COVID-19 real-time information updated by China CDC, thirty-four provinces were categorized into the different levels of COVID-19 risk areas.

Various categories of COVID-19 pop-science were listed for participants in the questionnaire in front of the scale. There were three dimensions: pandemic characteristics, related risk factors and preventive measures [9].

Problem recognition, involvement recognition, constraint recognition and situational motivation in problem solving were measured by a modified version of Kim and Grunig's STOPS scale [6]. The measurement of perception of risk referred to Cunningham's major dimensions [10]. These factors were measured in a five-point Likert scales (strongly disagree=1, strongly agree=5).

6. Results

6.1. Reliability Analysis

The reliability coefficient of the entire questionnaire and individual questions are both greater than 0.7, and the Cronbach's Alpha does not change significantly after deleting a relevant question. Therefore, this scale is suitable for our research.

KMO=0.930, Sig.=0.000, factors are correlated to each other. Exploratory Factor Analysis could be further carried on. All values of factor loadings are greater than 0.5 in EFA, which means each factor can well represent the information we obtain from subjects.

Through Principle Components Methods and Varimax Rotation, six common factors are extracted from the scale, with cumulative contribution rate of 66.135%.

6.2. Correlation Analysis

Pearson correlation coefficient was used to analyze the correlation between perception of risk, problem recognition, involvement recognition, situational motivation, and information transmission.

Perception of risk and problem recognition are significantly positive correlated. Perception of risk and involvement recognition are significantly positive correlated. Perception of risk and constraint recognition are significantly negative correlated. Perception of risk and situational motivation are significantly positive correlated. Perception of risk and information transmission are significantly positive correlated. Problem recognition and involvement recognition are significantly positive correlated. Problem recognition and constraint recognition are significantly negative correlated. Problem recognition and involvement recognition are significantly positive correlated. Problem recognition and situational motivation are significantly positive correlated. Problem recognition and information transmission are significantly positive correlated. Involvement recognition and constraint recognition are significantly negative correlated. Involvement recognition and situational motivation are significantly positive correlated. Involvement recognition and information transmission are significantly positive correlated. Constraint recognition and situational motivation are significantly negative correlated. Constraint recognition and information transmission are significantly negative correlated. Situational motivation and information transmission are significantly positive correlated ($P < 0.01$).

6.3. Regression Analysis

The multiple regression analysis was conducted with public's perception of risk, problem recognition, involvement recognition, and constraint recognition as independent variables and information transmission as dependent variable. R-squared and F-test are 0.699 and 184.861, and the p-value is smaller than 0.05, which means that the four recognition latitudes have

significantly influenced the dependent variables. While the t values and Beta values of publics' perception of risk, problem recognition and involvement recognition are greater than 0, it demonstrates that these three latitudes influence information transmission significantly and positively. The t value and Beta value of constraint recognition is smaller than 0, which shows that constraint recognition significantly and positively influences information transmission.

The multiple regression analysis was conducted with public's perception of risk, problem recognition, involvement recognition, and constraint recognition as independent variables and situational motivation as dependent variable. The value of R-squared and F-test are 0.251 and 26.848, and the p-values of publics' perception of risk and constraint recognition are both greater than 0.05, which means that the two recognition latitudes do not have significant impacts on situational motivation. While the p-values of publics' problem and involvement recognition are smaller than 0.05, and their t values and Beta values are greater than 0, it demonstrates that the two latitudes influence situational motivation significantly and positively.

The multiple regression analysis was conducted with public's perception of risk, problem recognition, involvement recognition, constraint recognition, and situational motivation as independent variables and information transmission as dependent variable. The R-squared rises from 0.699 to 0.706, and the F-test are 184.861 and 152.818; The p-values of public's perception of risk, problem recognition, involvement recognition, constraint recognition and situational motivation are all smaller than 0.05. The t values and Beta values of public's perception of risk, problem recognition, involvement recognition, and situational motivation are all greater than 0, which shows that they significantly and positively influence information transmission. The t value and Beta value of public's constraint recognition are smaller than 0, and this demonstrates that constraint recognition significantly and negatively influences information transmission. The influence casted by public's perception of risk and constraint recognition is not significant, and the problem and involvement recognition influence their situational motivation significantly, which helps prove the mediated effects.

7. Discussion and Conclusion

This study introduced apply opinion theory to health communication. The higher the precepted risk is, the more motivated individuals become on resolving problems and transferring information. The more people become aware of the emergency of COVID-19 and the fact that a resolution is still in urgent need, the more active they transmit and share COVID-19 pop-science. The stronger individuals realize that they are vulnerable to the problem, the more likely they will perform information transmission. However, the more people learn about the difficulties and problems while tackling problems related with the pandemic themselves, the less likely they will transmit and share pop-science related to the virus.

Perception of risk was introduced as an independent variable regarding the impact of health problems. The results show the effectiveness of perception of risk, which is an important factor in the motivation of health communication.

This study investigated the public's information transmission behaviors of a particular type of health information on social medias during this global public health emergency, and on, specifically, why and how health information were transferred. As COVID-19 pop-science become more and more disseminated across the internet, more people will be able to access essential health information and therefore perform protective measures; This quality is highly important in public health emergencies, such as Ebola Virus Disease and COVID-19. We believe that better understandings on the influence mechanisms of publics' health information transmission behaviors and publics' perception of a health issue could both be extremely helpful for future performances of health information popularization.

8. Limitations

This study did not involve social-psychological factors that might influence motivations to share health information. Further research can investigate health-information-transmission behaviors from the perspective of social psychology.

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