



A Study of the Causal Logic of Coronavirus Information on Social Media Users' Purchasing Behaviour

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Abstract. In December 2022, the control measures for the “coronavirus” were adjusted. Following this adjustment, social media has been discussing the topic. Social media has spread a lot of information about the new measures, making it difficult for people to process a large amount of information and influencing their purchasing behaviour. Based on the S-O-R paradigm theory of environmental psychology, the S-O-R paradigm model was constructed by combining the explanatory structural model (ISM). The results of the study show that the fourteen factors were analysed in terms of their levels of influence on social media users, and the accuracy of the explanatory structure model and the cross-matrix multiplication method was further demonstrated by the consistency of the explanatory structure model and cross-matrix multiplication method.

Keywords: coronavirus · purchasing behaviour · social media users · influencing factors

1 Introduction

The emergence of the “coronavirus” has posed a huge challenge to health in our country and globally, and the outbreak of the “coronavirus” in late 2019 has become a representative public health emergency. A public health emergency is by its nature an undesired behaviour that defies individual expectations and goals [1].

Compared with the SARS period in 2003, the current rapid development of information technology in China has made it easy for people to access all kinds of information through the Internet. In the aftermath of this adjustment in control measures, most people snapped up antipyretics, alcohol, Lianhua Qingwen granule, N95 masks and even canned yellow peaches. This study will provide a theoretical basis for scholars at home and abroad to further study the behaviour of social media users.

2 Review of the Literature

Scholars have also conducted relevant studies from this perspective. For example, Zhang Yanfeng, Liu Yali, and Zou Kai have used the information ecology theory as a basis to explore the factors influencing social media users' health information anxiety and its

hierarchical classification in the context of public health emergencies, and finally made recommendations on the influencing factors [2].

Anxiety produces certain behaviours that are triggered by the primary nervous system to avoid anxiety [2]. Scholars have conducted more studies on avoidance behaviour in the context of social media users' behaviour in public health emergencies. For example, Dai-Bao and Yang Zeguo obtained that information factors, environmental factors and user factors are factors that influence social media users' information avoidance behaviour through the study of the information synthesis method [4].

3 Analysis of Factors Influencing Social Media Users' Buying Behaviour

The combination of the explanatory structural model and the cross-matrix multiplication method not only further clarifies the hierarchy of influencing factors, understanding the direct and root factors, etc., but also allows the relationships between the factors to be better elucidated based on the discovery of the various influencing factors. Using the S-O-R paradigm of environmental psychology, the three dimensions of environmental factors, information factors and user factors, we can better explain the mechanism of the influence of internal and external factors on social media users' behaviour. The following 13 factors were identified through a combination of relevant data and expert opinion, as shown in Table 1:

Table 1. Factors influencing the purchasing behaviour of social media users with information about the "coronavirus"

Properties	Variables	Influencing factors
User factors	S1	Self-efficacy
	S2	Anxiety
	S3	Sensing body condition
	S4	Higher perceived risk
	S5	Information matches perception
	S6	The message is provocative
	S7	Determining the authenticity of information
	S8	Information visualisation
	S9	Wide access to information
Information factor	S10	Quality of information
	S11	Information is needed
	S12	Informative
Environmental factors	S13	Subjective norms

Table 2. Reachable matrix

factor	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
S1	1	0	0	0	0	0	0	0	0	0	0	0	0
S2	0	1	0	0	0	0	0	0	0	0	0	0	0
S3	0	1	1	0	0	0	0	0	0	0	0	0	0
S4	1	1	0	1	0	0	0	0	0	0	0	0	0
S5	1	1	1	1	1	0	0	0	0	0	0	0	0
S6	1	1	1	1	0	1	0	0	0	0	0	0	0
S7	1	1	0	1	0	0	1	0	0	0	0	0	0
S8	1	1	1	1	0	1	0	1	0	0	0	0	0
S9	1	1	1	1	0	1	1	1	1	0	0	0	0
S10	1	1	1	1	0	1	0	0	0	1	0	0	0
S11	1	1	1	1	0	1	1	1	0	0	1	0	0
S12	1	1	1	1	1	1	1	1	0	0	0	1	0
S13	1	1	1	1	0	1	1	1	1	0	0	0	1

4 Development and Analysis of the ISM MICMAC Model

4.1 Building the Adjacency Matrix

The research was conducted on relevant literature at home and abroad, and the influencing factors were determined by combining expert scoring, which was set as SN ($N = 1,2,3,\dots,n$). Through expert scoring, the stronger the correlation between the elements the higher the score, based on which the adjacency matrix was calculated.

4.2 Calculating the Reachable Matrix

The reachability matrix P is calculated based on the adjacency matrix. The reachability matrix of factors influencing the purchasing behaviour of social media users can be obtained by using the above formulae, see Table 2.

4.3 Hierarchy

Based on the reachability matrix P, the relationship between the factors influencing the purchase behaviour of social media users was inductively derived from the information on “coronavirus”, and the reachable and antecedent sets of the factors influencing the purchase behaviour of social media users were further derived, where the reachable set is $R(S_i)$ and the antecedent set is $A(S_i)$. In table, A is the intersection of the reachable set and the antecedent set. As in Table 3.

After dividing the information on the “coronavirus”, we obtained the following hierarchy of factors influencing the purchasing behaviour of social media users: Level

Table 3. Predecessor sets and reachable sets of reachable matrices

Factors	R(S) _i	A(S) _i	A
S1	1	1,4,5,6,7,8,9,10,11,12,13	1
S2	2,3,4,5,6,7,8,9,10,11,12,13	2,3,4,5,6,7,8,9,10,11,12,13	2
S3	2,3	3,5,6,8,9,10,11,12,13	3
S4	1,2,4.	4,5,6,7,8,9,10,11,12,13	4
S5	1, 2, 3, 4, 5	5,12	5
S6	1,2,3,4,6	6,8,9,10,11,12,13	6
S7	1,2,4,7	7,9,11,12,13	7
S8	1,2,3,4,6,8	8,9,11,12,13	8
S9	1,2,3,4,6,7,8,9	9,13	9
S10	1,2,3,4,6,10	10,12,13	10
S11	1,2,3,4,6,7,8,11	11	11
S12	1,2,3,4,5,6,7,8,12	12	12
S13	1,2,3,4,6,7,8,9,13	13	13

1 (S1, S2); Level 2 (S3, S4); Level 3 (S6, S7); Level 4 (S5, S8, S9); Level 5 (S13, S12, S11, S10).

4.4 Analysis of the Explanatory Structural Model

In the above analysis, five levels were identified, and a structural model was constructed to explain the influence of the “coronavirus” information on the purchasing behaviour of social media users, based on the relationship between each factor, see Fig. 1:

4.5 Factor “Driver-Dependency” Quadrant Mapping

Based on the reachability matrix P, the drivers and dependencies of the influencing factors are calculated and analysed. The results of the calculation of the driving forces and dependencies of the factors influencing the purchasing behaviour of social media users in the context of the adjustment of air control measures for the “coronavirus” are shown in Table 4.

As shown in Fig. 2.

4.6 “Driving Force-Dependency” Analysis

1. It is clear from environmental psychology that the attitudes and behaviours of social media users are directly influenced by the psychological states that arise from external stimuli. And are driven by their perceptions of risk to produce anxiety and panic. Combining Figs. 1 and 2, it can be seen that the direct layer of ISM influences is distributed in the dependency group in the ‘Drivers-Dependency’ quadrant. The factors in

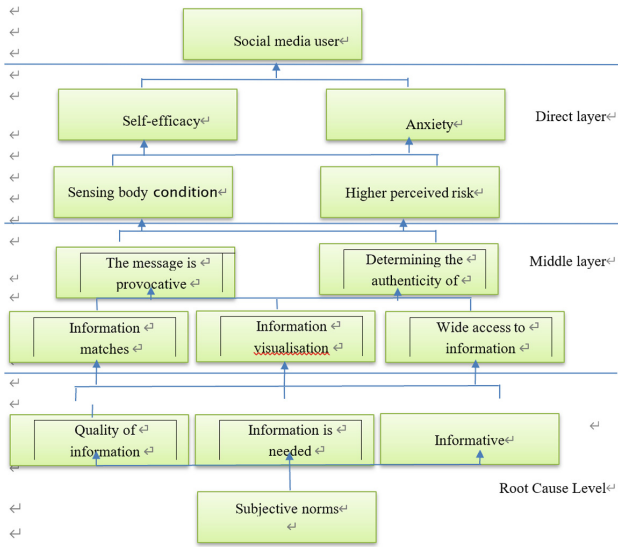


Fig. 1. Structural model for explaining the factors influencing social media users’ purchasing behaviour

Table 4. Influence factor dependence and driver values

Factors	Dependency	Driving force
S1	11	1
S2	12	1
S3	9	2
S4	10	3
S5	2	5
S6	7	5
S7	5	4
S8	5	6
S9	2	8
S10	1	6
S11	1	8
S12	1	9
S13	1	9

this quadrant are characterised by high dependence and low drive. After learning about the adjustment of the control measures, some social media users perceive the risk.

2. The cognitive structure plays an intermediate role, with different perceptions influencing risk perception and emotions. A combined look at Figs. 1 and 2 shows that most of

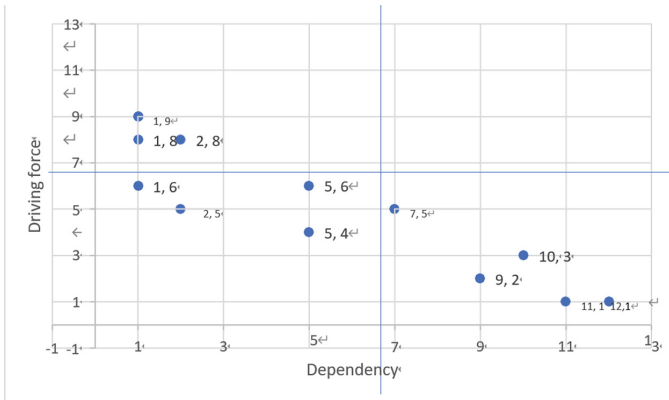


Fig. 2. Classification of influencing factors “Drivers – Dependencies”

the ISM intermediate level factors are distributed in the autonomy cluster in the ‘driver-dependence’ quadrant. The middle tier plays a transitional role in the overall model. Social media users are given information and then learn more discrete information on the major social media platforms. The wide range of information available through social media can, on the one hand, make it difficult to judge the availability of information. At the same time, the more visual nature of the information makes social media users feel more alive and accelerates anxiety and fear, which can lead to a range of behaviours.

3. Environmental and information factors are the root factors, People choose group behaviour to satisfy the need to communicate emotionally, and this need increases with fear [5]. The information factor is linked to the environmental factor in that it causes social media users to act after receiving information about the adjustment of the control measures for the “new crown outbreak”. As can be seen in Figs. 1 and 2, the factors at the root of the ISM are mostly distributed in separate clusters in the “Drivers- Dependence” quadrant.

5 Making Recommendations

5.1 Reasonable Psychological Interventions for the Public to Strengthen Cognitive Structures

With the emergence of new control measures, there is a greater need for psychological interventions to minimise public tension. In this context, universities, enterprises and social organisations need to actively set up psychological counselling stations, and in light of the rapid development of the Internet, the establishment of online psychological counselling can also be added to broaden the scope of services, so that the public can be consulted at any time and anywhere to alleviate their anxiety and panic.

5.2 Strengthening Authoritative Information Publication Channels and Improving Information Quality

In the social media environment, the redundancy and quality of information available to social media users can lead to biased judgments of information, and the presence of a

large amount of false information on social media users not only does not reduce their anxiety and nervousness but can lead to new distress.

When social media users need to search for more information due to uncertain events, each social media platform should strengthen the strict control of information, regulate the dissemination of information, strengthen the audit of information that does not meet quality standards, and conduct multiple checks.

5.3 Understanding User Needs and Timely Release of Information in Ordinary Life and Work, the Views and Attitudes of the Group

It is important to have scientific guidance, to keep abreast of users' needs and to provide scientific, official and correct information so that rational emotions lead to group emotions or group rationality leads to individual irrationality. Herd mentality as an environmental factor content is also a root factor influencing social media user behaviour, so improving the irrational snapping behaviour of social media users requires active guidance of users.

6 Conclusion

This study investigates the factors and hierarchical relationships that influence the behaviour of social media users in purchasing medicines and epidemic prevention materials after the adjustment of the control and prevention measures.

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