[Extended Abstract]

# How Social Media Information Affects the Intention to Uptake Covid-19 Vaccine: Integrating ELM and HBM Models

[Summary]

Combining the elaboration likelihood model and health belief model, this study proposed an intergrative model and confirmed peripheral route (perceived opinion climate) as the main effect on audiences' intention to uptake COVID-19 vaccine.


*Keywords*: social media, COVID-19 vaccine, elaboration likelihood model, health belief model

**How Social Media Information Affects the Intention to Uptake Covid-19 Vaccine:**

**Integrating ELM and HBM Models**

Since the outbreak of COVID-19, governments around the world have been encouraging people to get vaccinated to control the epidemic effectively. As one of the first countries to develop the vaccine (Mitchell, 2020), China provides people with free vaccination and persuades them through many official channels (People's Daily, 2021). While, besides official voices, information on social media is also a significant source of positive or negative effects on vaccination (Zhang et al.,2020). Moreover, as social media, comments of other users under original posts also have an impact on audiences (Swani & Labrecque, 2020; Vinuales & Thomas, 2020). This study selectively integrates the elaboration likelihood model (ELM) and health belief model (HBM) to examine how information on social media affects audiences' intention to vaccinate.

**Literature Review**

In health communication, a large number of studies on vaccination persuasion regarded vaccines as a new technology. Specifically, these studies usually use the technology acceptance model (TAM) (Faturohman et al, 2021) and innovation diffusion (Naderi et al.,2021) as their theoretical basis, ignoring the audiences' perception of their information environment. Accordingly, based on the Knowledge-Attitude-Practice theory (Launiala, 2009), people's decision-making process usually follows the path: obtaining information → forming evaluation and judgment → facilitating the behavior.

For this study, the combination of the two models can conceptualize this process well. Based on ELM, people obtain and process information through the central or peripheral route (Petty & Cacioppo, 1981). Combined with HBM, audiences will form perceived benefits and

perceived barriers towards vaccine as their judgment and subsequently affect the final

vaccination. Thus, a research question was proposed:

RQ: Is it the central or peripheral route that has a decisive impact on perceived benefit,

perceived barrier, and the intention to uptake the vaccine?

**Method**

The study designed a 2 (argument quality, high vs low ) × 2 (perceived opinion climate,

positive vs negative) experiment. 80 students in a communication class of a university in

Shanghai, China were employed and divided into four groups. For each group, subjects were

required to view a screenshot of a piece of COVID-19 vaccine-related social media post with

comments under it and fill out the questionnaire. In this study, audiences evaluating three

dependent variables mainly based on argument quality were viewed as processing information

from central route and those who based on perceived opinion climate were viewed as rely on

peripheral route. The measurement of stimulus and dependent variables are as Table 1:

Table 1
*Measurements of stimulus and dependent variables*

| Variables | Measurement |
|---|---|
| AQ | |
| *High* | posts with well-structured and complete arguments from an official channel |
| *Low* | posts with incorrect or rumored information from unofficial channels |
| POC | |
| *Positive* | comments that support the vaccine and think it is beneficial |
| *Negative* | comments that against the vaccine and concern about the side effect |
| Perceived benefit | 6 items (Walrave et al, 2020), $M = 5.03$, $SD = 1.27$, $\alpha = .89$ |
| Perceived barrier | 4 items (Walrave et al, 2020), $M = 4.45$, $SD = 1.38$, $\alpha = .83$ |
| Intention to vaccinate | 3 items (Walrave et al, 2020), $M = 4.74$, $SD = 1.23$, $\alpha = .92$ |

AQ = argument quality, POC = perceived opinion climate, $M$ = mean, $SD$ = standard deviation, $\alpha$ = Cronbach's $\alpha$

## Result

The main finding is that, a main effect of perceived opinion climate on perceived benefit, perceived barrier, and intention to vaccinate was found. Details are as follows (see Table 2). In the future progress of this study, a structural equation modeling analysis would be conducted to examine the effect of different pairs of argument quality and perceived opinion climate on intention to vaccinate through perceived benefit and perceived barrier. A more detailed discussion and conclusion would be included in the future progress of this study.

Table 2
*Results of analysis of variance of the experiment*

| | M (SD) | | | | F values and effect size | | |
| | High AQ | | Low AQ | | Main effects | | Interaction |
| | Positive POC | Negative POC | Positive POC | Negative POC | AQ | POC | AQ × POC |
|---|---|---|---|---|---|---|---|
| Perceived benefit | 6.08 (1.18) | 4.21 (1.02) | 5.90 (.82) | 3.92 (.87) | 2.87, $\eta^2 = .02$ | 8.62*, $\eta^2 = .28$ | 2.12, $\eta^2 = .01$ |
| Perceived barrier | 3.68 (1.26) | 5.85 (1.02) | 3.15 (.93) | 5.12 (.87) | 1.95, $\eta^2 = .01$ | 12.24*, $\eta^2 = .42$ | 2.13, $\eta^2 = .01$ |
| Intention to vaccinate | 5.81 (1.02) | 3.55 (.91) | 5.64 (1.12) | 3.97 (.69) | 2.23, $\eta^2 = .01$ | 18.60**, $\eta^2 = .68$ | 6.64†, $\eta^2 = .15$ |

†$p < .10$, *$p < .05$, **$p < .01$.

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