The role of intellectual humility in predicting investigative behavioral tendencies towards COVID-19 vaccine news

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Abstract

During Coronavirus Disease 2019 (COVID-19) pandemic, the spread of fake news on social media occurred massively. To avoid any negative impacts, people are expected to exhibit investigative behavior towards the news they encounter, including conducting fact checks. Previous research has shown that intellectual humility can influence investigative behavior when exposed to fake news about COVID-19. This study aims to examine intellectual humility's ability to predict investigative behavior when dealing with news about the COVID-19 vaccine. The study involved 227 students (157 female and 70 male, M = 21, SD = 1.19) as respondents who were selected by convenience sampling. The instruments used in revealing the two variables are the General Intellectual Humility Scale, headlines of news articles about the COVID-19 vaccine, and the scale of investigative behavior tendencies towards news about the COVID-19 vaccine. The results showed that intellectual humility could predict investigative behavior towards fake (B = 0.63; 95% CI [0.47, 0.80], p < 0,001) and fact news headlines (B = 0.69; 95% CI [0.51, 0.87], p < 0,001) about the COVID-19 vaccine. This finding implies that higher intellectual humility in individuals is predicted to increase investigative behavior towards news about the COVID-19 vaccine.

Keywords

covid-19, fake news, intellectual humility, investigative behavior, pandemic

Introduction

The Coronavirus Disease 2019 (COVID-19) pandemic has taken many human lives and caused significant economic, social, and health shocks worldwide (WHO, 2020). This ongoing pandemic, which is not known when it will end, has caused psychological impacts in the form of fear, anxiety, and stress that can reduce the quality of life and psychological well-being. (El Keshky *et al.*, 2020; Saladino *et al.*, 2020). The pandemic impacts college students' feelings (loss of motivation, anxiety, stress, and isolation) and behaviour (maintaining distance, changing ways of studying, and reducing going out from home) (Browning *et al.*, 2021).

The current era of information technology pandemic makes people switch their activities to the internet, especially social media – internet-based channels that allow users to conduct social interactions with other people broadly and narrowly, both synchronously and asynchronously. (Bayer *et al.*, 2020; Carr & Hayes, 2015). The use of social media increased sharply during the pandemic, with different preferences for social media platforms (WHO, 2021). Social media becomes a means that is able to spread information quickly during the pandemic (Merchant & Lurie, 2020). In an effort to overcome the anxiety faced during the pandemic, people are advised to stay connected with others through social media (APA, 2020). Social media is a tool that, if used wisely, can provide benefits in dealing with uncertainty during a pandemic (Wiederhold, 2020).

However, amid the rapid spread of the pandemic, the dissemination of information was no less rapid. This phenomenon is known as an infodemic, which is "an overabundance of information -some accurate and some not - that makes it hard for people to find trustworthy sources and reliable guidance when they need it"(PAHO, 2020). Infodemic is dangerous because it can disrupt the community in responding to the pandemic appropriately, so efforts are needed to prevent it from health authorities and experts (The Lancet, 2020; Zarocostas, 2020). High distress due to receiving information about COVID-19 can make people avoid information, reducing compliance with health protocols (Siebenhaar *et al.*, 2020).

The existence of an infodemic makes social media which is expected to provide benefits in the form of spreading information and connecting with each other, can cause losses. Social media is like a double-edged sword, which is to spread information as well as spread misinformation (Taylor, 2019). Fake news is one of the most common forms of disinformation during the pandemic.

Fake news is false information disseminated in a form resembling an accurate media news report (Lazer *et al.*, 2018; Pennycook & Rand, 2021). Fake news has become a public concern for three reasons: misinformation has become a part of everyday life; misinformation can have serious consequences if people believe it, and interactions

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in a harmonious life require mutual trust (Greifeneder *et al.*, 2021). The COVID-19 pandemic has led to a massive spread of fake news, considering that during the pandemic, social media helps people stay socially connected; online interaction platforms enable people to be allowed to disseminate information, whether accurate or not; and to assess the truth of information, people sometimes use their own assumptive and biased point of view (Hadlington *et al.*, 2022).

At the beginning of the pandemic, the spread of fake news related to COVID-19 increased. Analysis carried out on misinformation related to COVID-19 during the beginning of the pandemic (January-March 2020) shows a drastic increase in fact-checking related to COVID-19, which means a higher circulation of misinformation related to COVID-19 (Brennen *et al.*, 2020). The analysis also found that most of the 225 misinformation articles studied were twisted truths, and only a few were made. The research on 534 misinformation about COVID-19 circulating in Indonesia from January to April 2020 found a similar pattern (Angeline *et al.*, 2020). Since the pandemic, there have been 2,098 findings of false information (hoax) regarding COVID-19 in Indonesia, with the distribution of hoaxes (scams) on social media as many as 5,482 (Kemkominfo, 2022).

Unfortunately, the high circulation of fake news in Indonesia during the pandemic was not accompanied by adequate awareness. The survey conducted on residents aged 18 to 40 years in 24 countries found that most respondents (59%) were well aware of fake news during the pandemic. However, Indonesia ranks lowest in awareness of fake news (13%) (WHO, 2021).

According to Kemkominfo (2020), The digital literacy index in Indonesia is at a moderate level or has not reached a reasonable level. This condition makes Indonesian people vulnerable to exposure to fake news. Regarding the COVID-19 vaccine, a survey conducted by the Katadata Insight Center on 1,061 respondents in 34 provinces in Indonesia in November 2021 found that, although most of the respondents stated that the vaccine used in Indonesia was safe (93%) and vaccination was effective against COVID-19 (91%), several respondents still believe in hoaxes related to the COVID-19 vaccine (Annur, 2022). Based on the survey results, the hoaxes referred to include the Covid-19 vaccine are: no need as long as you have a healthy lifestyle (16.8%), business conspiracy (12.4%), death (9.8%), power immune system becomes weak and easy to get sick (7.7%), doubtful of its halal (7.2%), get the Covid-19 itself (6.5%), increases male stamina (6.2%), doubts its effectiveness because it was produced in bulk (4.1%), containing magnets (2.5%), containing chips (2.2%), become robots (1.6%), containing borax and formalin (1.6%), containing magnets (5%), and make it sterile (1.3%).

Misinformation spread on social media during the COVID-19 pandemic impacts one's emotions of fear and panic (Gabarron *et al.*, 2021). Although, according to Lazer *et al.* (2018), studies on the impact of fake news on individuals are still small; fake news and other forms of misinformation are seen as dangerous because they can cause several adverse effects. Repeated exposure to fake news reduces people's tendency to morally condemn the fake news so that they feel it is not wrong to spread it (Effron & Raj, 2020). In addition, exposure to fake news related to COVID-19 reduces people's intentions to carry out health-related behaviours (Greene & Murphy, 2021). Among them, getting fake news that the COVID-19 vaccine being developed is not safe for the body reduces people's intention to get the vaccine.

Considering the high number of people exposed to fake news and the negative impacts caused by fake news, people need to develop behaviours that can independently distinguish between fake news and facts. Such behaviour is called investigative behaviour, an action intended to check the validity of the information encountered (Koetke *et al.*, 2021). According to Koetke *et al.* (2021), when reading the title of a news article on social media, people with high investigative behaviour will take time to check the truth of the news, check the credibility of news sources, seek alternative opinions regarding the topic being reported, and read the entire article willingly in order to understand its content.

In addition to environmental factors, people's vulnerability to fake news is also influenced by individual characteristics, including cognitive factors (Sindermann *et al.*, 2020). Analytical thinking and an open-minded can affect the low belief about fake news (Bronstein *et al.*, 2021; Pennycook *et al.*, 2020). Compared to people with high cognitive abilities, people with low cognitive skills tend not to change their attitudes after being informed that the previous news was inaccurate. (De keersmaecker & Roets, 2017). In other words, fake news that people with low cognitive abilities received first tended to persist even though they had been told that the information was false. In another study, people with higher analytical thinking skills were better able to distinguish between genuine news and fake news about COVID-19 (Pennycook *et al.*, 2020).

Another cognitive factor that plays a role in a person's ability to deal with exposure to fake news is intellectual humility. Intellectual humility means "recognizing that a particular personal belief may be fallible, accompanied by an appropriate attentiveness to limitations in the evidentiary basis of that belief and to one's own limitations in obtaining and evaluating relevant information" (Leary, 2018). According to Leary, intellectual humility is a cognitive phenomenon related to how people think and process information about themselves and their world. Thus, the level of intellectual humility in a person is affected by the extent to which cognitive abilities and analytical thinking are possessed (Du & Cai, 2020; Krumrei-Mancuso *et al.*, 2020). Cognitive flexibility and intelligence also affect a person's high intellectual humility (Zmigrod *et al.*, 2019).

Intellectual humility shows specific characteristics that, if present in a person, can affect their likelihood to react appropriately to fake news. Intellectual humility is concerned with how people process information and judge what they already know or don't know (Deffler *et al.*, 2016). In his research, Deffler *et al.* (2016) found that compared to people with low intellectual humility, people with high intellectual humility tend to be less confident in responding to the wrong answer but not with the correct answer. It was also found that people with high intellectual humility also tend to take longer to read sentences whose contents contradict their personal views than those with low intellectual humility.

People with high intellectual humility tend to be more responsive to information about specific topics. In an experiment, compared to participants with low intellectual humility, participants in a high intellectual humility state

would be willing to change their views on a particular topic after being given new information about the subject. (Krumrei-Mancuso & Newman, 2020). People with intellectual humility are associated with several characteristics related to how to acquire knowledge, such as reflective thinking, curiosity, intellectual openness, intellectual involvement, and open thinking (Krumrei-Mancuso *et al.*, 2020). Krumrei-Mancuso *et al.* (2020) also found that people with high intellectual humility are more internally motivated to learn in order to gain knowledge. In another study, people with high intellectual humility tend to show learning behaviour, namely seeking challenges, exerting more significant effort, and persisting despite facing setbacks to master particular desired abilities. (Porter *et al.*, 2020). The existence of internal motives in learning and the tendency to show learning behaviour in people with high intellectual humility allows them to take independent action in checking the truth of the information they encounter.

Several characteristics of intellectual humility strengthen the view that there is a relationship between intellectual humility and investigative behaviour. Research conducted by Koetke *et al.* (2021) showed that when presented with fake news headlines on several topics related to COVID-19, regarding social distancing and wearing masks, people with high intellectual humility were more likely to show a tendency for investigative behaviour in the form of intentions and actual behaviour.

This study aims to replicate the research (study 1) by Koetke *et al.* (2021), which shows the influence of intellectual humility on investigative behaviour when people encounter fake news about COVID-19. To increase the generalizability of these findings, Koetke *et al.* (2021) suggest doing further research using different news headlines. In this study, the news headlines used were about the COVID-19 vaccine, whereas in previous studies, it referred to news about deaths from COVID-19 and how to prevent transmission of COVID-19 (Koetke *et al.*, 2021). The news headlines regarding the COVID-19 vaccine were chosen considering, as stated above, that many Indonesians still believe in hoaxes related to the COVID-19 vaccine. The headlines about the COVID-19 vaccine were also chosen considering that people's low ability to detect fake news is associated with a lower desire to get vaccinated (Montagni *et al.*, 2021), so news about the COVID-19 vaccine amid vaccination is considered essential. While research participants Koetke *et al.* (2021) most of the graduates of diplomas two and above, all participants in this study were students. Of the 170 million (61.8% of the population) social media users in Indonesia, students (18-24 years old) are the second largest segment of social media users after the age of 25-35 years (We Are Social & Hootsuite, 2021). However, even though students in Indonesia tend to view social media as not a reliable source of information (WHO, 2021), students tend to be reluctant to take information-seeking actions to verify the news they find on social media, and even spread the news without verifying it first (Nurrahmi & Syam, 2020). In Nurrahmi & Syam (2020)'s research, students are reluctant to verify news generally found on social media, so that this trend can apply to all news, including information about COVID-19.

Based on the above thinking, we hypothesize that when they encounter news headlines about the COVID-19 vaccine, students with high intellectual humility tend to show high investigative behaviour towards it (Hypothesis 1). Referring to the findings of Koetke *et al.* (2021) that high intellectual humility predicts high investigative behaviour towards fake news headlines but not fact headlines; this study hypothesizes that high intellectual humility in college students predicts high investigative behaviour towards fake news headlines regarding the COVID-19 vaccine but does not to the factual news headlines (Hypothesis 2).

Method

Research Design

This study was a non-experimental quantitative survey study. This method allows us to find out the correlation among variables being studied by asking participants about the variables. The participants were recruited using non-probability, convenience sampling technique. This technique allows us to recruit the participants that suited the determined criteria. The population of the study was Indonesian university students. Samples in this study were university students who were parts of our social networks and willing to participate in this study. The data were collected cross-sectionally in one period of time using a questionnaire designed in Google Forms. Google Form link was distributed through social media (i.e., WhatsApp and Instagram).

Participants

Respondents in this study were 227 university students, consisting of 157 female students (69.16%) and 70 male students (30.84%). The respondents' age ranged from 18 to 24 years old (M =21, SD= 1.119). Most respondents lived in Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek) (n=182, 80.2%), while the rest 45 respondents lived in West Java, Central Java, East Java, Banten, Yogyakarta, Sumatera, Kalimantan, Maluku, and Papua (19.8%). They were Javanese (n=79, 34.8%), Betawi (n=31, 13.6%), Sundanese (n=29, 12.8%), and other ethnicities including Batak, Minang, Madura, and Bugis (n=32, 14.1%). Fifty-six respondents did not mention their ethnicity specifically (24.7%). The data were collected from 15 June until 5 July 2021.

Research Instrument

Intellectual humility . Intellectual Humility In this study, we measured intellectual humility using General Intellectual Humility Scale, adapted from (Leary *et al.*, 2017) for the purpose of the study ($\alpha = 0,76$). This unidimensional scale consisted of six item statements, such as "I question my own opinions, positions, and viewpoints because they could be wrong." Respondents answered by choosing one of the five Likert scales, which ranging from 1 (Not likely) to 5 (very likely). This scale was selected because it uses common consensus in defining intellectual humility, generally measures the tendency of intellectual humility in addressing all life domains, and defines intellectual humility as a cognitive phenomenon that does no include behavioral aspects (Koetke *et al.*, 2021; Leary, 2018; Leary *et al.*, 2017).

News article title/headline News Article Headline News article headline used in this study refers to the paradigm applied in previous studies on fake news (e.g., Pennycook

& Rand (2019)). Four news article headlines were presented, containing news title, illustration, and one or two leads. These four headlines comprises two fake news and two facts. Two fake news were selected based on fact-checks carried out by Ministry of Communication and Information of the Republic of Indonesia,("Setelah Divaksin Lebih Rentan Terinfeksi COVID-19" (Vaccinated peoples are more prone to Covid-19 infection") and "Vaksin COVID-19 Memiliki Chip yang dapat Melacak Keberadaan Orang yang Telah Disuntikan Vaksin" (COVID-19 Vaccine contains chip to track vaccinated people)). Two factual news were taken from trusted online media ("Kemenkes: Antibodi Bisa Terbentuk 99 Persen Setelah Disuntik Dua Dosis Vaksin Sinovac" (Ministry of Health: Antibody is 99% formed after two doses of Sinovac vaccines" and "Ahli Ungkap Keamanan Vaksin Sinovac RI Efikasi 65,3 Persen" (Experts find Sinovac Vaccine RI has a 65.3% efficacy). We did not include the sources of the news article. Respondents were given these headlines and asked regarding their investigative behavior when reading these news.

Investigative behavioural tendencies We employed investigative behavioral tendency designed by Koetke *et al.* (2021), which was adapted specifically for the purpose of this study. This unidimensional scale measured the possibility of individuals engaging in investigative behaviors, defined as behaviors done to check the truth of an information (Koetke *et al.*, 2021). This scale consisted of four questions to examine the degree of participants' intention to do investigative activities. These four questions are related to fact-checking (" How likely is it for you to spend time checking facts made in this article?", source-checking (How likely is it for you to spend time learning further about the source of this article?), seeking alternative opinions (" How likely is it for you to search for alternative opinions regarding the topic of this article?, and fully reading the article (" Do you want to read the full article?) Respondents responded to the first three questions by selecting one of the 7 points Likert scale, ranging from 1 (not unlikely) to 7 (very likely). the last question was answered using yes/no responses (no = 0, yes= 1). Scores obtained from responding these questions were combined to measure participants' investigative behavioral tendency toward fake news ($\alpha = 0,86$) and factual news ($\alpha = 0, 92$).

Research Procedure

After reading the research purpose, signing the consent forms, and completing identity forms, participants begun to fill General Intellectual Humility Scale. After that, they were given four headlines that comprised of two fake news and two facts. For every headline, participants were asked about their tendency of investigative behaviors toward the news.

Data Analysis

We statistically analyzed the data using JASP. The descriptive analysis was made to find out participants' level of intellectual humility and investigative behavioral tendency. Assumption test was performed prior to further analyses. The correlational analysis was made to see the relationship between intellectual humility and investigative behaviors when reading Covid-19 vaccine news headline. Meanwhile, the linear regression was employed to the extent to which the intellectual humility

predicts participants' investigative behavioral tendency when reading Covid-19 vaccine headlines.

Result

Descriptive analysis

We performed a descriptive analysis to find out participants' level of intellectual humility and investigative behaviors. Participants' level of intellectual humility and investigative behaviors were classified into three categories: low, moderate, high. The analysis result demonstrates that most participants have a high level of intellectual humility (80.2%). Most participants (49.3%) reported moderate level of investigative behaviors toward fake news, and high level of investigative behaviors toward factual news (60.8%). Table 1 below presents participants' score categorizations on each variable.

Hypothesis test

The assumption test consisting of normality, linearity, and homoscedasticity tests were performed prior to testing the hypothesis. Data transformation was performed to address negative skewness. The standardized residual histogram, Q-Q plot of standardized residuals, and predicted vs. residual plots showed that the assumptions of normality, linearity, and homoscedasticity were met.

We performed a correlation analysis to test the first hypothesis. The correlation analysis result indicated a positive, significant relationship between intellectual humility and investigative behaviors toward Covid-19 vaccine headline news article, either fake news ($r = 0.46$, $p < 0.001$) or factual news ($r = 0.46$, $p < 0.001$). Participants with higher intellectual humility was found to be associated with higher investigative behaviors towards Covid-19 vaccine fake and factual news headlines. Thus, the proposed hypothesis 1 was accepted. Table 2. below presents the mean score, standard deviation, and inter-variable correlations

We made a linear regression analysis to test the second hypothesis, i.e., to see the intellectual humility's ability in predicting investigative behavioral tendency toward COVID-19 vaccine news headline. We performed two models for each criteria, i.e., investigative behavioral tendency towards fake news and investigative behavioral tendency towards factual news. In each model, we controlled the effect of age and gender on investigative behavioral tendency. The analysis result showed that the first model could account for variance of investigative behavioral tendency towards fake news by 22% ($F_{(3, 223)} = 20.99$; $p < 0.001$; $R^2 = 0.22$.) Intellectual humility was found to account for variance of investigative behavioral tendency towards fake news, and every 1 point increase in intellectual humility will likely increase investigative behavioral tendency towards fake news by 0.63 point ($B = 0,63$; 95% CI [0,47, 0,80]; $p < 0,001$). The second model may account for variance of investigative behavioral tendency towards fake news by 23% ($F_{(3, 223)} = 21.60$; $p < 0.001$; $R^2 = 0.23$.) Intellectual humility was found to account for variance of investigative behavioral tendency towards fake news, and every 1 point increase in intellectual humility will likely increase investigative behavioral tendency towards fake news by 0.69 point ($B = 0,69$; 95% CI [0,51, 0,87]; $p < 0,001$). Intellectual humility was found to predict

Table 1. Categorization of Participants' Scores

Variable	Reference	Score	Category	n	%
Intellectual humility	$X \leq (\mu - \sigma)$	$X \leq 14$	Low	1	0,4
	$(\mu - \sigma) < X < (\mu + \sigma)$	$14 < X < 22$	Moderate	44	19,4
	$X > (\mu + \sigma)$	$X > 22$	High	182	80,2
Investigative behavior on Fake news	$X \leq (\mu - \sigma)$	$X \leq 18,67$	Low	8	3,5
	$(\mu - \sigma) < X < (\mu + \sigma)$	$18,67 < X < 31,33$	Moderate	112	49,3
	$X > (\mu + \sigma)$	$X > 31,33$	High	107	47,1
Investigative behavior on factual news	$X \leq (\mu - \sigma)$	$X \leq 18,67$	Low	7	3,1
	$(\mu - \sigma) < X < (\mu + \sigma)$	$18,67 < X < 31,33$	Moderate	82	36,1
	$X > (\mu + \sigma)$	$X > 31,33$	High	138	60,8

N = 227, X = Participants score, μ = hypothetical M, σ = hypothetical SD.

Table 2. Average, Standard Deviation, and Correlation Between Research Variables

Variable	M	SD	1	2	3
IH	24.8	3.22	--		
IB on fake news	31.1	7.05	0.46***	--	
IB of factual news	33	7.32	0.46***	0.73***	--

IH = Intellectual Humility, IB = Investigative Behaviour * p < .05, ** p < .01, *** p < .001

participants' investigative behavioral tendency toward fake and factual news on COVID-19 vaccines. In other words, the proposed hypothesis 2 was partially accepted. The following table 3 displays the regression analysis result.

Discussion

The COVID-19 pandemic has made the spread of fake news massive. Fake news causes several negative impacts in the form of fear and panic, decreased moral sensitivity, and low healthy behaviour. To prevent the harm caused, people need to develop several individual qualities, both cognitive and behavioural, to avoid spreading fake news. Cognitive quality in intellectual humility plays a role in growing behaviour that can inhibit the rate of spreading fake news in the form of investigative behaviour.

The findings of this study that intellectual humility has a positive relationship with investigative behaviour tendencies toward news article headlines indicate that both intellectual humility and investigative behaviour tendencies involve cognitive factors. Intellectual humility relates to how people think and process the information around them, including information they do not know (Deffler *et al.*, 2016; Leary, 2018). The cognitive abilities and analytical thinking possessed by people with high intellectual humility (Du & Cai, 2020; Krumrei-Mancuso *et al.*, 2020) enable them to avoid exposure to fake news (Bronstein *et al.*, 2021; De keersmaecker & Roets, 2017) including fake news about COVID-19 (Pennycook *et al.*, 2020) which is shown by taking investigative actions on the news they encounter. Investigative behaviour involves cognitive factors as indicated by fact-checking, checking the credibility of news sources, seeking alternative opinions regarding news topics, and willingness to read all articles (Koetke *et al.*, 2021).

This study resulted in the finding that intellectual humility can predict the tendency of investigative behaviour to both fake news headlines and fact news headlines. These findings are in line with previous findings that people with high intellectual humility tend to be more responsive to information about specific topics (Krumrei-Mancuso & Newman, 2020). People with intellectual humility are also associated with a number of cognitive and behavioural characteristics related to acquiring knowledge (Krumrei-Mancuso *et al.*, 2020; Porter *et al.*, 2020). Based on the findings of Krumrei-Mancuso *et al.* (2020), in addition to influencing the ability to think analytically, people with high intellectual humility affect an increased tendency to cognitive activity (need for cognition), curiosity, and interest in being involved in intellectually including reading readings that challenge their intellectuality. Investigative behaviour shown by people with high intellectual humility is carried out to fulfil these cognitive tendencies.

This study's findings align with Koetke *et al.* (2021) that intellectual humility predicts investigative behavior. However, the findings of this study differ from those of Koetke *et al.* (2021), that intellectual humility predicts investigative behavior only on fake news headlines but not on fact headlines. In this study, intellectual humility predicts investigative behavior against fake and fact news headlines. Research shows that people with high intellectual humility tend to have curiosity which is shown through high motivation to seek new information (Krumrei-Mancuso *et al.*, 2020). This can be explained that information about the COVID-19 vaccine is essential for participants to know so that they deem it necessary to obtain adequate knowledge about it. Research shows that when people perceive that they may be infected with COVID-19, people will tend to seek new information about COVID-19 (Hwang *et al.*, 2021). At the time of data collection, there were still many Indonesians who had not been vaccinated against COVID-19, judging by the low rate of the first vaccination, which was 17 percent (Satuan Tugas Penanganan COVID-19, 2021). News about the COVID-19 vaccine is new information that people need to know so that, even though the news presented is a fact, people with high intellectual humility consider it necessary to take investigative action against the news.

High investigative behaviour in people with high intellectual humility can be understood because people with high intellectual humility are more precise in assessing the accuracy of information. In viewing an article in the form of a topic that is analyzed in a balanced way (from two points of view), people with high intellectual humility tend to be high in assessing the accuracy of the article, while

Table 3. Results of Intellectual Humility Regression Analysis in Predicting Investigative Behaviour Tendencies towards Fake News and Fact News

Variable	IB on fake news					IB on actual news				
	B	95% CI LL	95% CI UL	SE B	β	B	95% CI LL	95% CI UL	SE B	β
IH Constant	2.91	0.27	5.56	1.34		4.75	1.81	7.69	1.49	
	0.63	0.47	0.8	0.08	0.46***	0.69	0.51	0.87	0.09	0.44***

people with low intellectual humility rate the accuracy of the article lower (Leary *et al.*, 2017). An accurate assessment of the information found makes people with high intellectual humility willing to show investigative behaviour towards the headlines of news articles related to the COVID-19 vaccine, both in the form of fake and fact news.

The limitation of this research is that the research was conducted using a survey method. The investigative behaviour studied is also still in the form of behavioural tendencies or intentions, not actual behaviour. Another limitation, the researchers only controlled for gender and age variables. They did not control for other variables that might influence investigative behaviour towards news about the COVID-19 vaccine, including the ability to think analytically and whether or not they were familiar with the information they encountered. (Pennycook & Rand, 2019).

Conclusion

This study found that when they encounter news headlines about the COVID-19 vaccine, participants with high intellectual humility will tend to show high investigative behaviour towards the news headlines. It was also found that high intellectual humility in participants predicts high investigative behaviour towards fake news headlines and factual headlines regarding the COVID-19 vaccine.

Due to the infodemic during the pandemic, which allows a lot of misinformation to be spread on social media, individuals must take investigative action by taking the time to check the truth of the news they find. Ways that can be done to encourage investigative behaviour are as follows: admitting that certain personal beliefs may be wrong, giving attention to the limitations in the evidentiary basis of such personal beliefs, and paying attention to his limitations in obtaining and evaluating relevant information. Individuals with high intellectual humility are expected to be able to inhibit the spread of misinformation during the pandemic while also preventing several negative impacts due to the circulation of fake news and other forms of misinformation in society.

Further research needs to be done using experimental methods by manipulating intellectual humility in order to know whether intellectual humility can affect investigative behaviour on news headlines. Experimental research needs to be done so that participants can demonstrate investigative behaviour as they do in everyday life. Future research is expected to be able to control other variables that influence investigative behaviour, including the ability to think analytically and whether they are familiar with the news they encounter. To increase the generalizability of these findings, further research can be carried out using other forms of misinformation besides fake news, for example, unverified information in the form of articles circulating on social media, rumors, conspiratorial information, and hate speech on social media. (Wu *et al.*, 2019).

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