

What promotes cognitive dissonance among anti-vaccine members in Indonesia?

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ABSTRACT

This study aimed to examine the influence of expectations on vaccines, trust in government, perceived threats, and information overload to cognitive dissonance and its implications for vaccine use, behavioral negotiation, and information avoidance. After we formulated eight hypotheses, all of them was tested using the partial least squares structural equation modeling (PLS-SEM) method. This study involved 173 community members to fill out a questionnaire with 31 questions. The results showed that expectations of vaccines and information overload affected cognitive dissonance. In contrast, the perceived threat due to the COVID-19 pandemic and trust in the government did not affect cognitive dissonance. We also found that cognitive dissonance negatively and significantly affected vaccine use and positively and significantly affected behavior to continue negotiating and avoiding information related to COVID-19 vaccination. This study is among the first to examine members of the anti-vaccine community quantitatively and practically attempts to intervene in the anti-vaccine community so that they are cognitively dissonant are to increase expectations of vaccination and confuse them by presenting the information overload they receive.

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1. INTRODUCTION

Recently, efforts to develop an effective vaccine against COVID-19 have been challenged by public doubts about using vaccines [1]-[3]. These doubts form difficulties in accepting or even outright rejecting the vaccine even though the vaccine is available. In a situation like this, doubts about vaccines become an urgent problem that must be resolved immediately. The rejection of vaccines is not new in the medical world because the WHO has designated vaccine skepticism as one of the top ten global threats to public health [2], [4]. Therefore, WHO recommends that governments in various parts of the world prioritize the promotion of willingness to vaccinate their citizens. In the past, vaccination rates for the anti-H1N1 vaccine in the 2009 influenza pandemic were below expectations, and therefore understanding the public's desire to be vaccinated against COVID-19 can provide critical information for policymakers about strategic steps to take to improve acceptance of the COVID-19 vaccine [5], [6].

In the aspect of prevention, public engagement with health protection behaviors, including social distancing and hygiene behavior, has been highlighted as one of the essential strategies to reduce the transmission of COVID-19 [7], [8]. Physical distancing refers to the behavior of minimizing one's close contact with others. Meanwhile, hygienic behavior is carried out by cleaning hands, surfaces of objects or

objects touched alternately by many people [9], [10]. However, these two behaviors cannot optimally prevent COVID-19 as a whole, so a COVID-19 vaccine is needed to suppress the spread of the virus, the death rate, and the economic impact it causes.

Vaccination is one of the most successful public health interventions and measures to prevent infectious diseases [11], [12]. Despite vaccine advances, continued public behavior is needed to maintain immunity, prevent the spread of vaccine-preventable diseases, and ensure the adoption of new vaccines [13]. Unfortunately, the use of vaccines is still not optimal. It happens because of public doubts about using vaccines. Doubt in the use of vaccines is the reluctance of patients to receive vaccines, and this is fueled by the views held about vaccines ranging from caution to outright denial and other reasons related to religion and culture [11], [14], [15].

One of the obstacles to implementing universal vaccination is disinformation and misinformation about the benefits of drug composition and the detrimental effects of vaccination, limiting patient understanding and involvement [16], [17]. More and more health information appears on the internet, including social media, and some of this information is wrong but gets a high level of publicity [18], [19], [20]. Later, it sparked a massive anti-vaccination movement in various parts of the world. This movement practically urges vaccine development companies to disclose various kinds of information about vaccines. In the COVID-19 pandemic situation, this problem is becoming more complicated because of the virus's reach that has invaded almost all countries globally. The anti-COVID-19 vaccine is expected to play an essential role in controlling the spread of the virus. The problem is that misinformation and unfounded rumors about COVID-19 and the potential for vaccination against the virus have sprung up on various communication channels and threaten and erode public trust long before a vaccine is officially released [21]-[23].

While scientists are creating a COVID-19 vaccine, a small but powerful anti-vaccination movement moves against it [1], [24]. Various anti-vaccine communities, which existed long before COVID-19 appeared, began to discuss the COVID-19 vaccine, and some of them refused to use the vaccine [17], [25]-[27]. Some of the news they provided included the COVID-19 virus vaccine to implant microchips into the human body [28]. Quantitatively, it is not known how many people are protesting against the COVID-19 vaccine. However, some researchers are starting to worry that their presence undermines efforts to mass-vaccinate [29]-[31]. This group is small but has an effective communication strategy and reaches the wider community. This community has fewer but more followers than the pro-vaccination community. On Facebook, they post a wide variety of information more than a pro-vaccination group [32].

Currently, information on the internet, especially social media, is the primary source of information and has resulted in many people becoming victims of fake news and online disinformation [18], [22], [33]. In more detail, the information is usually called an infodemic, which is characterized by fake news, misinformation, and conspiracy theories [33]. It creates extra uncertainty and a threat to people's daily life [34], [35]. During the COVID-19 pandemic, a lot of inconsistent and incorrect information was spread, which led to death [36]. The information included is misinformation related to the COVID-19 vaccine [33].

This study adapts cognitive dissonance theory to explain the response of the anti-vaccine community in accepting, rejecting, or negotiating a COVID-19 vaccine. Cognitive dissonance in the context of the COVID-19 vaccine refers to a lack of trust in a particular community or group due to inconsistent beliefs, ideas, values, and information during decision-making [37]. Cognitive dissonance theory states that because dissonance causes anxiety and uncertainty, individuals are motivated to relieve states of psychological discomfort by restoring their psychological balance [37]. Understanding the interrelationship of psycho-social factors in influencing people's willingness to vaccinate against COVID-19 is relevant to explain the complex psychological dynamics that can hinder individual motivation to vaccinate. Therefore, policymakers can as soon as possible carry out personalized counseling strategies and various other interventions that can foster a more postal approach to disease prevention and vaccination behavior. Therefore, policymakers can immediately implement personalized counseling strategies and other interventions to foster a more positive disease prevention and vaccination behavior approach.

Governments exacerbate this condition in several countries that seem to hurry to take steps, making policies without sufficient evidence [38]-[41]. It is because the government wants to be considered competent by its citizens. On the other hand, this government policy erodes public trust and increases their sense of powerlessness, a fertile ground for misinformation [42]. This condition also raises general questions about whether the government can conduct effective health communication in the context of public health emergencies to convey accurate information to its citizens. The presence of the internet, especially social media, has facilitated the dissemination of various kinds of information, including anti-vaccination sentiments. Since the early 2000s, the internet has served as a significant source of vaccine misinformation. Readers of misinformation about COVID-19 take less than 10 minutes to increase perceptions of risks associated with vaccination and decrease intention to vaccinate [29].

Several studies have explored the public's attitude towards the COVID-19 vaccine to a limited extent. A study with a large sample of Europeans found skepticism about a vaccine against COVID-19, especially among women and youth [43]. Other studies report that the perceived severity of COVID-19 and the level of perceived personal vulnerability to the risk of transmission impact hesitation to use vaccines [44], [45]. Other factors that are considered capable of influencing the use of vaccines are false health beliefs, conspiracy theories, and concerns about the safety and effectiveness of vaccines in the future. Although the debate about COVID-19 vaccine doubts is growing, current research reports focus heavily on limiting beliefs and attitudes about specific vaccinations against COVID-19, among them beliefs about the effectiveness and future safety of vaccines or the perceived severity of the COVID-19 vaccine [2], [46]-[48]. It addresses these research gaps, and this study aims to examine the effect of expectations on vaccines, trust in government, perceived threats, and information overload on cognitive dissonance and its implications for vaccine use, behavioral negotiation, and information avoidance.

Theoretically, this study provides insight into the psychological mechanisms that underlie why someone belonging to an anti-vaccine group wants or does not vaccinate against COVID-19. The results of this study can help explain the various factors that shape these attitudes and develop models to predict them. Practically speaking, this study offers policymakers and communication professionals clues to find ways to break down health rumors about a COVID-19 vaccine. The results of this study can be applied to develop strategies and interventions that reduce the threat of health misinformation and anti-vaccination rumors and reduce their harmful consequences.

Since the 1960s, several researchers have tried to find the antecedents and consequences of cognitive dissonance in individual behavior. In the context of members of the anti-vaccine community, once they have decided not to use various vaccines, they may compare their experience of not using previous vaccines in light of the dangers of COVID-19 [44], [49]. Therefore, we posit that the threat that individuals perceive will influence expectations for a COVID-19 vaccine. Previous research found that individual expectations of the product affect the level of dissonance experienced by individuals [49]. In this study, expectation refers to an individual's belief in refusing vaccine products for various reasons. Individuals experiencing dissonance tend to experience low levels of satisfaction with the product so, we assume that individual expectations of the COVID-19 vaccine will affect the level of dissonance. Hence, we formulated two hypotheses: i) H₁: The threat perceived by the individual will positively and significantly affect the individual's expectation of using the COVID-19 vaccine; and ii) H₂: Individual expectations of the COVID-19 vaccine will positively and significantly affect the level of cognitive dissonance.

COVID-19 spreads from person to person continuously and causes a high mortality rate [50], [51]. This condition makes this virus become a global epidemic. The economic consequences arising from the COVID-19 pandemic are also able to influence individual attitudes and behavior. Therefore, we posit that the threat of the disease causes the individual to evaluate his or her attitude toward not vaccinating. So, here is the third hypothesis (H₃): The threat perceived by the individual will affect the level of cognitive dissonance positively and significantly.

In response to the threat of COVID-19, the government is trying to communicate information about the disease and recommend preventive measures [7]. In addition to communications delivered by the government, a large volume of information is also present on social media. The information from social media is not worth the better quality of information because most of the content is misinformation and low-quality information, which creates information overload among the public [52], [53]. Therefore, we assume that information overload is why the individual evaluates his attitude not to vaccinate. So, here is the fourth hypothesis (H₄): Information overload received by individuals will affect the level of cognitive dissonance positively and significantly.

As governments become increasingly aware that the long-term success and success of government programs depend on the involvement of individual citizens, governments are increasingly adopting a people-centered approach [39], [51], [54]. However, many people believe that the government does not always act in their best interest, so researchers have considered public trust in the government as a variable that influences individual actions to participate in government programs or, in this case, the COVID-19 vaccine. However, no research has been found that reveals trust in government and cognitive dissonance experienced by individuals who experience distrust of government. Therefore, we assume that individuals who have a sense of trust in the government tend to experience dissonance, as formulated in the fifth hypothesis (H₅): Trust in the government will affect the level of cognitive dissonance positively and significantly.

Despite the considerable research on individual attitudes of anti-vaccine group members who experience dissonance due to intentional government through various interventions and other experiences, there has been no research exploring post-individual dissonance behavior. It is a disservice to the government because not following the vaccine is not the only response to discontent. Opportunities to restore confidence or provide sufficient information may be missed [55]. We distinguish three types of behavior after

individuals experience dissonance: using the COVID-19 vaccine, continuing their belief not to use the COVID-19 vaccine, and negotiating and ultimately undecided. More over we formulated hypotesis 6-8:

H₆: The level of cognitive dissonance will positively and significantly affect the use of the COVID-19 vaccine.

H₇: The level of cognitive dissonance will positively and significantly affect information avoidance behavior about COVID-19.

H₈: The level of cognitive dissonance will encourage individuals to negotiate with their beliefs against vaccines in a positive and significant way.

2. RESEARCH METHOD

This study employed a quantitative research design to examine the effects of product expectations, trust in government, and perceived threat to cognitive dissonance and the implications on using, not using or negotiating behavior. The researcher chose this research design because it examined the relationship between variables measured using various research instruments. Moreover, the limited explanation of the antecedents of the use of the COVID-19 vaccine prompted researchers to employ the structural equation model (SEM) partial least square (PLS) [56].

Since the number of members of the anti-vaccine group is unknown, this study employs purposive sampling by considering the opinion [57] that the minimum sample size is five times the number of questionnaire questions. Based on this thought, the number of samples in this study was 173 individual members of the anti-vaccine community who became the unit of analysis and received a questionnaire. some of the requirements considered to be the basis for the inclusion criteria of individuals who become respondents are: ii) at least 17 years old; ii) not using vaccines knowingly; and iii) joining the anti-vaccine social media movement (Facebook, Twitter, Whatsapp Groups and more).

2.1. Operational definition and measurement scale

The question items in the questionnaire came from the operationalization of variables which consisted of exogenous and endogenous variables. Exogenous variables in this study included expectations of vaccines, trust in the government, perceived threats, and information obtained. In comparison, the endogenous variables include cognitive dissonance, vaccine use, behavioral negotiation, and information avoidance. Vaccine expectations (EV): Vaccine expectations are defined as the extent to which individuals believe that the COVID-19 vaccine is a safe product to use. The indicator in the EV variable is derived from Brüssow [58] and consists of three statements. Trust in government (KP): Trust in this study is defined as an individual's trust in the government. The indicators in the KP variable are adapted from [43] and consist of four statements.

Perceived threat (AD): This study defines threat as the threat individuals feel due to COVID-19. The indicator in AD is derived from [55], which consists of four statements. Over-informed (ID): Over-acquired information is defined as the large amount of information that an individual has obtained due to sizable media coverage of COVID-19. The indicator in ID is derived from Pulido *et al.* [53], which consists of three statements. Cognitive dissonance (DK): Cognitive dissonance is a person's feeling of discomfort due to conflicting attitudes, thoughts, and behaviors and motivates a person to take specific actions to reduce the discomfort [59]. DK consists of eight statements.

Vaccine use (PN): Vaccine use is defined as an individual's behavior in using vaccines. Indicators in PN are defined by [60] and consist of three statements. Information avoidance (PI): Information avoidance is defined as behavior that avoids certain information. The PI was adapted from [9] with three statements. Finally, negotiating behavior (NP): Not using vaccines is an individual's behavior to continue their ideology of not using vaccines [61]. The indicators in this variable consist of three statements. This study uses a Likert scale of 1-7. The selection of this scale is based on the ability of the scale to measure respondents' opinions, attitudes, and feelings towards certain statements. The author provides five answer choices for each question in the study. Respondents can state their attitude towards the question by choosing one of the five options, ranging from strongly disagree to agree strongly.

2.2. The validity and reliability tests

The validity and reliability test in the PLS-SEM technique is called the measurement model test (outer model). The validity test is carried out to determine the ability of the research instrument to measure what it should measure [62]. Then, the reliability test is used to measure the consistency of the measuring instrument in measuring a concept. It can also be used to measure the consistency of respondents in answering questions in the questionnaire [63]. PLS can work on constructs with indicators that are reflective or formative [64]. In this study, the relationship between constructs and indicators is reflective. Therefore, this study only uses a reflective

measurement model. There are two validity tests in this study, namely convergent validity, and discriminant validity. Convergent validity relates to the principle that the measures of a construct must be highly correlated [63]. The correlation can be seen between the indicator value and the constructed value [64].

Discriminant validity relates to the principle that measures of different constructs should not be highly correlated, or in other words, each construct is unique [56]. It can be seen by comparing the cross-loading with the value of the outer loading on each indicator. The value of the outer loading indicator on a construct must be greater than the value of its cross-loading. Another way is to compare the square root of the AVE of a construct with the correlation between latent constructs [63]. To see the reliability of a construct, the author must pay attention to the value of Cronbach's alpha and composite reliability. Cronbach's alpha is used to measure the lower limit of the reliability of a construct, while composite reliability is used to measure the real reliability value of a construct.

2.3. Data analysis

Data analysis in this study consisted of two stages, namely descriptive analysis, and hypothesis testing. The author uses descriptive statistics to provide an overview of the research respondents. Furthermore, to test the hypothesis, the author uses the PLS technique. Descriptive statistics are statistics used to analyze data by describing and or describing the data that has been collected as it is by looking at the frequency, percentage, and values [65]. In this study, descriptive statistics were used to describe the demographics of respondents, such as age, education level, gender, and years of service, and the distribution of respondents' answers for each indicator.

Structural equation model (SEM) is a statistical technique for testing and estimating causal relationships that integrate factor analysis with path analysis [56]. There are two types of SEM: covariance-based-structural equation model (CB-SEM) based on covariance and partial least square-structural equation model based on variance. CB-SEM is used to confirm a theory, while PLS-SEM is used to predict a model for theory development [56]. This study uses PLS-SEM to develop a model that can predict the actual use of social media. In general, there are two stages in PLS-SEM, namely, evaluating the outer model and inner model [56]. The evaluation of the outer model is also called the validity and reliability test, which has been described in the previous sub-chapter. Evaluation of the inner model is used to test the research hypothesis.

After fulfilling the model measurement requirements through validity and reliability tests, the next step is to evaluate the structural model to test the research hypothesis. The structural model is measured by looking at: i) the coefficient of determination R^2 , the square of the multi-correlation of endogenous constructs with exogenous constructs, and ii) the β path coefficient between constructs in the research model. The value of R^2 indicates the strength of a construct in the research model. The higher the value of R^2 , a construct, the stronger/better the construct is. It also applies to the value of β . The value of β (for samples below 1,000) is said to be significant if the value is above 0.2, whereas if the value is below 0.1, it is said to be insignificant [56].

In the PLS-SEM, the significance test of the model is conducted through the sample bootstrapping technique. PLS-SEM does not require the data to be normally distributed, so the parametric significance test of regression analysis cannot be used to test the significance of outer loading, outer weight, or path coefficients [56]. The significance of the effect can be seen from the significance value (p-value). The level of significance commonly used in research is 0.05 (5%). The influence between variables is said to be significant if the p-value <0.05.

3. RESULTS AND DISCUSSION

3.1. Respondent demographics

There were 173 respondents filled out this questionnaire with details as contained in Table 1. As shown in Table 1, most of the respondents were women (65.3%). From the year of birth, most of the respondents were from Generation Z, born between 1995-2010 (80.3%). Then, from the level of education, most of them were high school and undergraduate graduates with 58.4% and 35.3% respectively. The respondents' occupations were students with 53.2% and followed by workers/employees/employees (22%). Their income mainly was under IDR 2,118,678.00 (72.8%), and the rest is above the nominal value.

Researchers also identified the uniqueness of each respondent about their activities as part of the anti-vaccine group. Most respondents were those who wanted to be vaccinated under certain conditions (50%), the next were those who did not want the vaccine but were silent (34.4%), and those who did not want to vaccinate against COVID-19 and did not get any vaccine were the same that was 26.8%. Only a few respondents actively share anti-vaccine information and join anti-vaccine social media, namely 7.7% and 1.2%, respectively.

Table 1. Respondent demographics

Respondent demographics	Number	Percentage
<i>Gender</i>		
Male	52	30.1%
Female	113	65.3%
Choose no to answer	8	4.6%
<i>Generation (by year of birth)</i>		
Baby Boomers (1946-1960)	3	1.7%
Gen X (1961-1980)	14	8.1%
GenY (1981-1994)	17	9.8%
Gen Z (1995-2010)	139	80.3%
GenAlfa (2011-2024)	3	1.7%
<i>Latest Education</i>		
Junior high school	5	2.9%
Senior high school	101	58.4%
Bachelor	61	35.3%
Master	6	3.5%
<i>Occupation</i>		
Entrepreneur	21	1.21%
Entrepreneur assisted by temporary workers	2	1.21%
Entrepreneur assisted by permanent workers	2	1.2%
Labor/Employee/Staff	38	22%
Freelance	18	10.4%
University student/student	92	53.2%
<i>Income</i>		
Under Rp. 2,118,678,00	126	72.8%
Over Rp. 2,118,678,00	47	27.2%
<i>Anti-vaccine Level</i>		
I only do not want to get vaccinated against COVID-19	45	26.8%
I did not do any vaccinations	45	26.8%
I want to be vaccinated with certain conditions	84	50%
I actively share anti-vaccine information	13	7.7%
I joined a Group (Whatsapp, Facebook, Telegram, and more.)	2	1.2%
I did not do the vaccine, and I just kept quiet	58	34.5%

3.2. Validity and reliability tests

To see the reliability of a construct, the authors pay attention to the value of Cronbach's alpha. Cronbach's alpha to measure the lower limit of the reliability of a construct, and to be accepted, the value of Cronbach's alpha must be >0.60 . The results showed that the Cronbach's Alpha value was acceptable for each construct because it was above 0.60 as shown in Table 2.

Table 2. Reliability test results

Variable	Cronbach's Alpha
Expectations for vaccines (EV)	0.886
Trust in government (KP)	0.876
Perceived threats (AD)	0.919
information overload (ID)	0.867
Cognitive dissonance (DK)	0.951
Vaccine use (PN)	0.976
Information avoidance (PI)	0.857
Behavioral negotiation (NP)	0.752

To assess the relationship between latent variables and the indicators that construct each variable, we examined composite reliability (CR) and average variance extracted (AVE), as shown in Table 3. This research model consists of seven variables, namely expectations of vaccines (EV), trust in the government (KP), perceived threats (AD), information overload (ID), cognitive dissonance (DK), vaccine use (PN), information avoidance (PI), and behavioral negotiation (NP). Loadings must be higher than 0.40 for acceptable reliability, and the AVE value must be more than 0.50. Then, the CR value of each construct was calculated to analyze the internal consistency of the proposed measurement model. The CR value should be between 0.70-0.90 to be considered as passing the test. Table 3 shows that the value of the loading for each indicator is acceptable because all of them are above 0.4. Then, the CR value for each proposed construct is also accepted because it is between 0.70-0.90.

Table 3. Model measurement assessment

Variable	Indicator	Loadings	Composite reliability	AVE
expectations of vaccines (EV)	EV1	0.881	0.930	0.815
	EV2	0.949		
	EV3	0.876		
trust in the government (KP)	KP1	0.864	0.918	0.815
	KP2	0.953		
	KP3	0.944		
	KP4	0.648		
Perceived threats (AD)	AD1	0.911	0.921	0.749
	AD2	0.980		
	AD3	0.899		
	AD4	0.631		
Overload information (ID)	ID1	0.841		
	ID2	0.914		
	ID3	0.910		
Cognitive dissonance (DK)	DK1	0.819	0.960	0.755
	DK2	0.564		
	DK3	0.806		
	DK4	0.918		
	DK5	0.961		
	DK6	0.957		
	DK7	0.961		
	DK8	0.892		
Vaccine use (PN)	PN1	0.980	0.985	0.955
	PN2	0.983		
	PN3	0.968		
Information avoidance (PI)	PI1	0.796	0.912	0.776
	PI2	0.911		
	PI3	0.930		
Behavioral negotiation (NP)	NP1	0.719	0.860	0.673
	NP2	0.838		
	NP3	0.895		

Meanwhile, the AVE value for all constructs in this study is acceptable because it is above 0.50. Next is the discriminant validity analysis, as shown in Table 4. Discriminant validity relates to the principle that measures of different constructs should not be highly correlated, or in other words, each construct is unique [56]. The discriminant validity of the measurement model was analyzed through the hetero trait–mono trait ratio of correlations (HTMT), where each construct had to be below 0.90 to indicate a low correlation and uniqueness. As shown in Table 4, all proposed variables were accepted because their values were below 0.90.

Table 4. Discriminant validity (HTMT.90)

Variable	EV	KP	AD	ID	DK	PN	PI	NP	Discriminant validity
expectations of vaccines (EV)									Valid
trust in the government (KP)	0.654								Valid
Perceived threats (AD)	0.620	0.585							Valid
Overload information (ID)	0.141	0.207	0.138						Valid
Cognitive dissonance (DK)	0.238	0.161	0.138	0.669					Valid
Vaccine use (PN)	0.800	0.423	0.488	0.172	0.461				Valid
Information avoidance (PI)	0.104	0.257	0.201	0.680	0.698	0.257			Valid
Behavioral negotiation (NP)	0.398	0.499	0.254	0.585	0.777	0.499	0.663		Valid

3.3. Structural model measurement

The structural model in this study was built based on the results of the measurement model. The results of statistical calculations showed that 47.5% of the cognitive dissonance variance (DK) was explained by expectations of the vaccine (EV), trust in the government (KP), perceived threat (AD), and information overload (ID). Meanwhile, the variance of expectations for the vaccine (EV) was explained by 48.5% by confidence in the government (KP). Lastly, the variance of vaccine use (PN), information avoidance (PI), and behavioral negotiation (NP) were explained by cognitive dissonance (DK), 40.4%, respectively; 34.1%; and 41.1%, respectively. In addition to estimating the magnitude of R^2 , we include predictive relevance as developed by [57], [63] as an additional model adequacy assessment. Based on the calculation results, there is a sufficient model to predict the manifest indicators of each latent variable. Cross-validated redundancy (Stone-Geisser Q^2) was calculated to test predictive relevance using a blindfolding procedure. As [63] suggest that the value of Q^2 should be greater than 0, the overall model in this study is considered predictive

relevance. In more detail, the measurement results are DK (0.332), EV (0.263), NP (0.258), PI (0.318), and PN (0.187). The research findings also show that the standardized root mean square residual (SRMR) and non-food items (NFI) values are 0.066 and 0.809, respectively, which indicate a good match and are statistically significant as recommended by [57], where the SRMR value must be less than 0.08, the NFI ranges from 0-1, and the closer to 1 the better.

This study also used a non-parametric bootstrap technique with 5,000 samples to test the structural model, as the results are in Table 5 and Figure 1. This method analyzes the structural model as recommended by [57] because the confidence interval of the bootstrap method is considered more accurate than other models [57]. Of the eight hypotheses proposed, six of them were accepted, and the rest were rejected. Moreover, first, the threat perceived by the individual affects the individual's expectation of using the COVID-19 vaccine positively and significantly at the 0.05 level. Second, individual expectations of the COVID-19 vaccine affect the level of cognitive dissonance negatively and significantly at the 0.05 level. Third, the threat perceived by the individual does not affect the level of cognitive dissonance positively and significantly. Fourth, excessive information received by individuals affects the level of cognitive dissonance positively and significantly. Fifth, trust in government does not affect the level of cognitive dissonance positively and significantly. Sixth, the level of cognitive dissonance affects the use of the COVID-19 vaccine negatively and significantly at the 0.05 level. Seventh, the level of cognitive dissonance affects information avoidance behavior about COVID-19 positively and significantly at the 0.05 level. Eighth, the level of cognitive dissonance encourages individuals to negotiate with their beliefs to reject the vaccine positively and significantly at the 0.05 level.

Table 5. Structural model measurement

Hypothesis	Hypotheses relationship	β -value	Standard deviation (STDEV)	T-Statistics (O/STDEV)	p-values	Conclusion
H1	KP->EV	0.697	0.047	14.885	0.000	Accepted
H2	EV ->DK	-0.566	0.076	7.462	0.000	Accepted
H3	AD->DK	0.008	0.105	0.073	0.942	Rejected
H4	ID ->DK	0.409	0.067	6.114	0.000	Accepted
H5	KP ->DK	0.054	0.080	0.672	0.502	Rejected
H6	DK ->PN	-0.636	0.065	9.819	0.000	Accepted
H7	DK ->PI	0.584	0.059	9.911	0.000	Accepted
H8	DK ->NP	0.641	0.058	11.044	0.000	Accepted

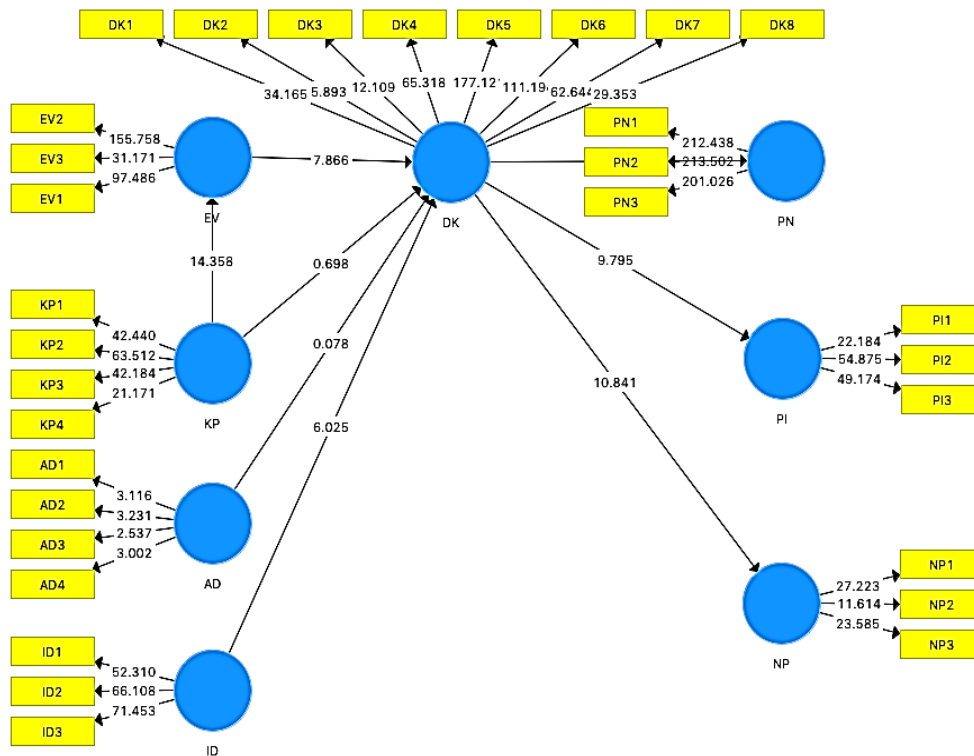


Figure 1. Structural model measurement

3.4. Discussion

This study aims to find the antecedents of cognitive dissonance in the anti-vaccine group and explain the response of community members to accept, reject or negotiate their intention to vaccinate against COVID-19. This research responds that anti-vaccine groups are actively and regularly conducting campaigns to increase their membership and encourage people not to vaccinate. In response, this study integrates various variables such as expectations of vaccines (EV), trust in government (KP), perceived threat (AD), and information overload (ID) as predictors of cognitive dissonance.

We found some interesting findings. The first is that the threat perceived by the individual affects the individual's expectations of using the COVID-19 vaccine in a positive and significant way, which is following the previous research [44], [49]. This finding means that even though individual members of the anti-vaccine community have decided not to get vaccinated, they may compare their experience of not using the vaccine with the experience of others using the vaccine. In Indonesia, those who have used the vaccine have certain privileges, such as boarding a plane, entering a shopping center, or eating at a particular restaurant. Although some individuals experience specific symptoms after vaccination, it is ignored because they have other, more attractive advantages. Moreover, they have the opportunity to get a vaccine with high efficacy.

The following finding is that individual expectations of the COVID-19 vaccine affect the level of cognitive dissonance negatively and significantly. This finding means that if expectations for vaccines are increased, cognitive dissonance decreases. Our findings indicate that the lower expectations of anti-vaccine group members when raised will make them less likely to experience cognitive dissonance. It implies that expectations for a COVID-19 vaccine must be lowered further. The results in this study do not confirm previous studies which found that individual expectations of the vaccine affect the level of dissonance experienced by individuals [49].

Another finding in this study is that the individual's perceived threat does not positively and significantly affect the level of cognitive dissonance. These findings indicate that individual members of the vaccine group community are not worried about the social, economic, and health threats caused by the COVID-19 pandemic so that they do not experience cognitive dissonance. This study's findings reject previous research that found a positive and significant effect of the individual's perceived threat on dissonance levels [49].

Next is the information overload that individuals receive affects the level of cognitive dissonance positively and significantly. Information, both against or supporting the COVID-19 vaccination effort, continues to increase in number, especially on social media. Individual Access to information increases, resulting in good information about the COVID-19 vaccine that encourages individuals to experience cognitive dissonance. Although the quality of information on social media is not comparable to the volume of information available, the government and various non-governmental organizations continue to fight false information about the COVID-19 vaccine. The findings of this study are the following [52], [53], who found that excessive information received by individuals will encourage individuals to experience dissonance.

Just as anti-vaccine groups may be affiliated with groups that do not believe in the government, they may also not believe in it [66]. Our findings are consistent with the study's findings that trust in government does not positively and significantly affect the level of cognitive dissonance. The implication is that no matter how much the government increases its efforts to build trust in anti-vaccine groups, it will be futile because it will not dissonate them. This study [39], [51], [54] found it essential to build public trust in the government to encourage successful vaccination.

Another interesting finding is that cognitive dissonance affects the use of the COVID-19 vaccine negatively and significantly, which indicates that higher dissonance will decrease the intention of members of the anti-vaccine group not to use the COVID-19 vaccine. This condition occurs because members of the anti-vaccine community already have a firm belief in not using vaccines. More specifically, they may end their search for a COVID-19 vaccine if they dissonate. Finally, cognitive dissonance encourages individuals to negotiate with their beliefs about refusing vaccines positively and significantly. It is a common thing to happen because information regarding the success of the COVID-19 vaccine also continues to increase, and the government continues to provide benefits to individuals who vaccinate, which encourages them to continue negotiating.

4. CONCLUSION

This study revealed that in general, vaccine expectations and information overload were found to affect cognitive dissonance, whereas perceived threat from the COVID-19 pandemic and trust in government did not affect cognitive dissonance. We also found that cognitive dissonance negatively and significantly affected vaccine use. It positively and significantly influenced behavior to continue negotiating and avoiding information related to COVID-19 vaccination.

Our findings contribute theoretically for several reasons. First, this study found the determinants of individual cognitive dissonance of members of the anti-vaccine group, namely expectations of vaccines and information overload received. Meanwhile, two other predictors that did not contribute to cognitive dissonance were perceived threat and trust in government. Second, this study confirms that cognitively dissonant individuals persist in their decision to use vaccines and what they do is continue to negotiate and avoid information related to COVID-19 vaccines. Third, this study investigates members of the anti-vaccine community who in previous studies were difficult to reach.

Practically speaking, the results of this study indicate that efforts to encourage members of anti-vaccine groups to carry out vaccines are not easy efforts. Some efforts that can be made are to intervene so that they are cognitively dissonant by increasing expectations of vaccination and confusing them by presenting the information overload they receive. Things like increasing their anxiety by making them feel uncomfortable because of the COVID-19 pandemic and increasing their trust in the government will not dissonate them cognitively. Another empirical finding is that they will find it difficult to follow the vaccination program because they continue to negotiate and avoid information.

The four predictors proposed in this study could explain cognitive dissonance less than 50%. Therefore, other variables such as opinion leaders from health groups or religious groups might be integrated into future research. Second, we have difficulty finding a sample frame because their group members continue to increase, so this study uses a non-probability sampling technique. As a consequence, the results of this study cannot be generalized. We also identified that members of anti-vaccine groups might have different strengths because militant groups are difficult to reach and actively distribute and recruit new members. Moreover, there are also passive members because they do not want the vaccine and are silent. This finding is interesting for further research. Qualitative studies such as phenomenology and ethnography will also be interesting to obtain a more comprehensive picture of the behavior of members of the anti-vaccine community.

REFERENCES




- [1] R. Boodoosingh, L. O. Olayemi, and F. A. L. Sam, "COVID-19 vaccines: Getting Anti-vaxxers involved in the discussion," *World Development*, vol. 136, 2020, doi: 10.1016/j.worlddev.2020.105177.
- [2] M. Detoc, S. Bruel, P. Frappe, B. Tardy, E. Botelho-Nevers, and A. Gagneux-Brunon, "Intention to participate in a COVID-19 vaccine clinical trial and to get vaccinated against COVID-19 in France during the pandemic," *Vaccine*, vol. 38, no. 45, pp. 7002–7006, 2020, doi: 10.1016/j.vaccine.2020.09.041.
- [3] S. Barello, T. Nania, F. Dellafiore, G. Graffigna, and R. Caruso, "'Vaccine hesitancy' among university students in Italy during the COVID-19 pandemic," *European Journal of Epidemiology*, vol. 35, no. 8, pp. 781–783, 2020, doi: 10.1007/s10654-020-00670-z.
- [4] J. H. Tanne, "Covid-19: US will not join WHO in developing vaccine," *BMJ (Clinical research ed.)*, vol. 370, p. m3396, 2020, doi: 10.1136/bmj.m3396.
- [5] M. Cascella, M. Rajnik, A. Cuomo, S. C. Dulebohn, and R. Di Napoli, *Features, Evaluation and Treatment Coronavirus (COVID-19)*. StatPearls Publishing, 2020.
- [6] J. K. Ward *et al.*, "The French public's attitudes to a future COVID-19 vaccine: The politicization of a public health issue," *Social Science and Medicine*, vol. 265, 2020, doi: 10.1016/j.socscimed.2020.113414.
- [7] Q. Chen, C. Min, W. Zhang, G. Wang, X. Ma, and R. Evans, "Unpacking the black box: How to promote citizen engagement through government social media during the COVID-19 crisis," *Computers in Human Behavior*, vol. 110, no. March, p. 106380, 2020, doi: 10.1016/j.chb.2020.106380.
- [8] K. Faasse and J. Newby, "Public Perceptions of COVID-19 in Australia: Perceived Risk, Knowledge, Health-Protective Behaviors, and Vaccine Intentions," *Frontiers in Psychology*, vol. 11, 2020, doi: 10.3389/fpsyg.2020.551004.
- [9] A. Vandormael, M. Adam, M. Greuel, and T. Bärnighausen, "A short, animated video to improve good COVID-19 hygiene practices: A structured summary of a study protocol for a randomized controlled trial," *Trials*, vol. 21, no. 1, 2020, doi: 10.1186/s13063-020-04449-1.
- [10] F. A. Moraga-Llop, M. Fernández-Prada, A. M. Grande-Tejada, L. I. Martínez-Alcorta, D. Moreno-Pérez, and J. J. Pérez-Martín, "Recovering lost vaccine coverage due to COVID-19 pandemic," *Vacunas*, vol. 21, no. 2, pp. 129–135, 2020, doi: 10.1016/j.vacun.2020.07.001.
- [11] E. Wang, Y. Baras, and A. M. Buttenheim, "Everybody just wants to do what's best for their child: Understanding how pro-vaccine parents can support a culture of vaccine hesitancy," *Vaccine*, vol. 33, no. 48, pp. 6703–6709, 2015, doi: 10.1016/j.vaccine.2015.10.090.
- [12] N. Yiannakoulis, C. E. Slavik, and M. Chase, "Expressions of pro- and anti-vaccine sentiment on YouTube," *Vaccine*, vol. 37, no. 15, pp. 2057–2064, 2019, doi: 10.1016/j.vaccine.2019.03.001.
- [13] S. Vanderslott, "Exploring the meaning of pro-vaccine activism across two countries," *Social Science and Medicine*, vol. 222, pp. 59–66, 2019, doi: 10.1016/j.socscimed.2018.12.033.
- [14] E. Dubé, M. Vivion, and N. E. MacDonald, "Vaccine hesitancy, vaccine refusal and the anti-vaccine movement: Influence, impact and implications," *Expert Review of Vaccines*, vol. 14, no. 1, pp. 99–117, 2014, doi: 10.1586/14760584.2015.964212.
- [15] E. Nekrasova *et al.*, "Vaccine hesitancy and influenza beliefs among parents of children requiring a second dose of influenza vaccine in a season: An American Academy of Pediatrics (AAP) Pediatric Research in Office Settings (PROS) study," *Human Vaccines and Immunotherapeutics*, vol. 16, no. 5, pp. 1070–1077, 2020, doi: 10.1080/21645515.2019.1707006.
- [16] R. Grace, "COVID-19 prompts the spread of disinformation across MENA," *Middle East Institute*, Mar. 2020. <https://www.mei.edu/publications/covid-19-prompts-spread-disinformation-across-mena> (accessed May 17, 2020).
- [17] P. Żuk, P. Żuk, and J. Lisiewicz-Jakubaszko, "The anti-vaccine movement in Poland: The socio-cultural conditions of the opposition to vaccination and threats to public health," *Vaccine*, vol. 37, no. 11, pp. 1491–1494, 2019, doi: 10.1016/j.vaccine.2019.01.073.
- [18] S. Tasnim, M. Hossain, and H. Mazumder, "Impact of rumors and misinformation on COVID-19 in Social Media," *Journal of*

- Preventive Medicine and Public Health*, vol. 53, no. 3, pp. 171–174, 2020, doi: 10.3961/JPMMPH.20.094.
- [19] Y. Wang, M. McKee, A. Torbica, and D. Stuckler, “Systematic Literature Review on the Spread of Health-related Misinformation on Social Media,” *Social Science and Medicine*, vol. 240, no. September, p. 112552, 2019, doi: 10.1016/j.socscimed.2019.112552.
- [20] J. K. Harris, N. L. Mueller, and D. Snider, “Social media adoption in local health departments nationwide,” *American Journal of Public Health*, vol. 103, no. 9, pp. 1700–1707, 2013, doi: 10.2105/AJPH.2012.301166.
- [21] N. M. Krause, I. Freiling, B. Beets, and D. Brossard, “Fact-checking as risk communication: the multi-layered risk of misinformation in times of COVID-19,” *Journal of Risk Research*, vol. 23, no. 7–8, pp. 1052–1059, Apr. 2020, doi: 10.1080/13669877.2020.1756385.
- [22] A. J. S. Brennen, F. M. Simon, P. N. Howard, and R. K. Nielsen, “Types, Sources, and Claims of COVID-19 Misinformation,” *Oxford University Press*, no. April, pp. 1–13, 2020.
- [23] J. Y. Cuan-Baltazar, M. J. Muñoz-Perez, C. Robledo-Vega, M. F. Pérez-Zepeda, and E. Soto-Vega, “Misinformation of COVID-19 on the internet: Infodemiology study,” *JMIR Public Health and Surveillance*, vol. 6, no. 2, p. e18444, Apr. 2020, doi: 10.2196/18444.
- [24] R. N. Kostoff, M. B. Briggs, A. L. Porter, D. A. Spandidos, and A. Tsatsakis, “Comment: COVID-19 vaccine safety,” *International Journal of Molecular Medicine*, vol. 46, no. 5, pp. 1599–1602, 2020, doi: 10.3892/ijmm.2020.4733.
- [25] J. Goad and M. Durham, *The anti-vaccine movement: A pharmacist's view*. 2013. doi: 10.1007/978-1-4614-7438-8_6.
- [26] S. Westin, “Postmodern anti-vaccine movement | Postmoderne vaksinevegring,” *Tidsskrift for den Norske Laegeforening*, vol. 122, no. 8, p. 772, 2002.
- [27] J. Howard and D. R. Reiss, *The anti-vaccine movement: A litany of fallacy and errors*. 2018. doi: 10.7551/mitpress/9780262037426.003.0008.
- [28] W. Cornwall, “Officials gird for a war on vaccine misinformation Fears of a rushed COVID-19 vaccine and rise of social media demand new messaging strategy,” *Science*, vol. 369, no. 6499, pp. 14–19, 2020, doi: 10.1126/science.369.6499.14.
- [29] J. Garay, R. Yap, and M. J. Sabellano, “An analysis on the insights of the anti-vaccine movement from social media posts using k-means clustering algorithm and VADER sentiment analyzer,” in *IOP Conference Series: Materials Science and Engineering*, 2019, vol. 482, no. 1. doi: 10.1088/1757-899X/482/1/012043.
- [30] M. Szejekowska, A. Zalski, A. Krupa, E. Kuchar, and A. Nitsch-Osuch, “Perception of the anti-vaccine movements activity and the immunization performance in Warsaw University students,” *International Review of Medical Practice*, vol. 25, no. 3, pp. 97–101, 2019.
- [31] G. A. Poland, R. M. Jacobson, and I. G. Ovsyannikova, “Trends affecting the future of vaccine development and delivery: The role of demographics, regulatory science, the anti-vaccine movement, and vaccinomics,” *Vaccine*, vol. 27, no. 25–26, pp. 3240–3244, 2009, doi: 10.1016/j.vaccine.2009.01.069.
- [32] E. Ortiz-Sánchez *et al.*, “Analysis of the anti-vaccine movement in social networks: A systematic review,” *International Journal of Environmental Research and Public Health*, vol. 17, no. 15, pp. 1–11, 2020, doi: 10.3390/ijerph17155394.
- [33] A. A. Dror *et al.*, “Vaccine hesitancy: the next challenge in the fight against COVID-19,” *European Journal of Epidemiology*, vol. 35, no. 8, pp. 775–779, 2020, doi: 10.1007/s10654-020-00671-y.
- [34] C. Venuleo, O. C. G. Gelo, and S. Salvatore, “Fear, affective semiosis, and management of the pandemic crisis: Covid-19 as semiotic vaccine?,” *Clinical Neuropsychiatry*, vol. 17, no. 2, pp. 117–130, 2020, doi: 10.36131/CN20200218.
- [35] H. J. Larson, “Blocking information on COVID-19 can fuel the spread of misinformation,” *Nature*, vol. 580, no. 7803, p. 306, Apr. 2020, doi: 10.1038/d41586-020-00920-w.
- [36] G. Pennycook, J. McPhetres, Y. Zhang, J. G. Lu, and D. G. Rand, “Fighting COVID-19 Misinformation on Social Media: Experimental Evidence for a Scalable Accuracy-Nudge Intervention,” *Psychological Science*, vol. 31, no. 7, pp. 770–780, 2020, doi: 10.1177/0956797620939054.
- [37] C. Morvan and A. J. O'Connor, *A theory of cognitive dissonance*. California: Stanford University Press, 2017. doi: 10.4324/9781912282432.
- [38] S. Olivia, J. Gibson, and R. Nasrudin, “Indonesia in the Time of Covid-19,” *Bulletin of Indonesian Economic Studies*, vol. 56, no. 2, pp. 143–174, May 2020, doi: 10.1080/00074918.2020.1798581.
- [39] X. Gao and J. Yu, “Public governance mechanism in the prevention and control of the COVID-19: information, decision-making and execution,” *Journal of Chinese Governance*, vol. 5, no. 2, pp. 178–197, Apr. 2020, doi: 10.1080/23812346.2020.1744922.
- [40] S. Wilson, “Pandemic leadership: Lessons from New Zealand’s approach to COVID-19,” *Leadership*, vol. 16, no. 3, pp. 279–293, Jun. 2020, doi: 10.1177/1742715020929151.
- [41] G. D. Sempowski, K. O. Saunders, P. Acharya, K. J. Wiehe, and B. F. Haynes, “Pandemic Preparedness: Developing Vaccines and Therapeutic Antibodies For COVID-19,” *Cell*, vol. 181, no. 7, pp. 1458–1463, 2020, doi: 10.1016/j.cell.2020.05.041.
- [42] L. Tapia, “COVID-19 and fake news in the Dominican Republic,” *American Journal of Tropical Medicine and Hygiene*, vol. 102, no. 6, pp. 1172–1174, Apr. 2020, doi: 10.4269/ajtmh.20-0234.
- [43] J. V. Lazarus *et al.*, “A global survey of potential acceptance of a COVID-19 vaccine,” *Nature Medicine*, vol. 27, no. 2, pp. 225–228, 2021, doi: 10.1038/s41591-020-1124-9.
- [44] A. Odone, D. Bucci, R. Croci, M. Riccò, P. Affanni, and C. Signorelli, “Vaccine hesitancy in COVID-19 times. An update from Italy before flu season starts,” *Acta Biomedica*, vol. 91, no. 3, pp. 1–5, 2020, doi: 10.23750/abm.v91i3.10549.
- [45] G. Graffigna, L. Palamenghi, S. Boccia, and S. Barello, “Relationship between citizens’ health engagement and intention to take the covid-19 vaccine in Italy: A mediation analysis,” *Vaccines*, vol. 8, no. 4, pp. 1–11, 2020, doi: 10.3390/vaccines8040576.
- [46] V. Grech, C. Gauci, and S. Agius, “Vaccine hesitancy among Maltese healthcare workers toward influenza and novel COVID-19 vaccination,” *Early Human Development*, 2020, doi: 10.1016/j.earlhumdev.2020.105213.
- [47] V. Grech *et al.*, “Needed: Less influenza vaccine hesitancy and less presenteeism among health care workers in the COVID-19 era,” *Early Human Development*, 2020, doi: 10.1016/j.earlhumdev.2020.105215.
- [48] N. Puri, E. A. Coomes, H. Haghbayan, and K. Gunaratne, “Social media and vaccine hesitancy: new updates for the era of COVID-19 and globalized infectious diseases,” *Human Vaccines and Immunotherapeutics*, pp. 2586–2593, 2020, doi: 10.1080/21645515.2020.1780846.
- [49] A. S. Bradshaw *et al.*, “Propagandizing anti-vaccination: Analysis of Vaccines Revealed documentary series,” *Vaccine*, vol. 38, no. 8, pp. 2058–2069, 2020, doi: 10.1016/j.vaccine.2019.12.027.
- [50] A. Suryahadi, R. Al Izzati, and D. Suryadarma, “Estimating the Impact of Covid-19 on Poverty in Indonesia*,” *Bulletin of Indonesian Economic Studies*, vol. 56, no. 2, pp. 175–192, May 2020, doi: 10.1080/00074918.2020.1779390.
- [51] A. Tashiro and R. Shaw, “COVID-19 pandemic response in Japan: What is behind the initial flattening of the curve?,” *Sustainability (Switzerland)*, vol. 12, no. 13, 2020, doi: 10.3390/su12135250.
- [52] D. Orso, N. Federici, R. Copetti, L. Vetrugno, and T. Bove, “Infodemic and the spread of fake news in the COVID-19-era,” *European Journal of Emergency Medicine*, vol. 27, no. 5, pp. 327–328, Apr. 2020, doi: 10.1097/MEJ.0000000000000713.
- [53] C. M. Pulido, B. Villarejo-Carballido, G. Redondo-Sama, and A. Gómez, “COVID-19 infodemic: More retweets for science-




- based information on coronavirus than for false information,” *International Sociology*, vol. 35, no. 4, pp. 377–392, Apr. 2020, doi: 10.1177/0268580920914755.
- [54] G. Scally, B. Jacobson, and K. Abbasi, “The UK’s public health response to covid-19,” *The BMJ*, vol. 369. BMJ Publishing Group, May 2020. doi: 10.1136/bmj.m1932.
- [55] A. S. Abdelhafiz *et al.*, “Knowledge, Perceptions, and Attitude of Egyptians Towards the Novel Coronavirus Disease (COVID-19),” *Journal of Community Health*, vol. 45, no. 5, pp. 881–890, Apr. 2020, doi: 10.1007/s10900-020-00827-7.
- [56] J. F. Hair, M. Sarstedt, C. M. Ringle, and J. A. Mena, “An assessment of the use of partial least squares structural equation modeling in marketing research,” *Journal of the Academy of Marketing Science*, vol. 40, no. 3, pp. 414–433, 2012, doi: 10.1007/s11747-011-0261-6.
- [57] D. J. Ketchen, *A Primer on Partial Least Squares Structural Equation Modeling*, vol. 46, no. 1–2. 2013. doi: 10.1016/j.lrp.2013.01.002.
- [58] H. Brüßow, “Efforts towards a COVID-19 vaccine,” *Environmental Microbiology*, vol. 22, no. 10, pp. 4071–4084, 2020, doi: 10.1111/1462-2920.15225.
- [59] M. Jeong, H. Zo, C. H. Lee, and Y. Ceran, “Feeling displeasure from online social media postings: A study using cognitive dissonance theory,” *Computers in Human Behavior*, vol. 97, pp. 231–240, 2019, doi: 10.1016/j.chb.2019.02.021.
- [60] M. S. Nadeem *et al.*, “COVID-19: Prospective challenges and potential vaccines,” *Alternative Therapies in Health and Medicine*, vol. 26, pp. 72–78, 2020.
- [61] M. Hancock, A. Hadgis, K. Hancock, B. Bowles, P. Brown, and T. Higgins, *Cognitive Dissonance in a Multi-mind Automated Decision System*, vol. 11580 LNAI. 2019. doi: 10.1007/978-3-030-22419-6_4.
- [62] J. Justice, “Purpose and significance of research design.” In *Handbook of research methods for public administration*, eds. K. Yang and G. J. Miller, New York, NY: CRC Press. 2007, pp. 75–92.
- [63] J. H. Abdillah W, *PLS (Partial Least Square) Concepts and Applications for Empirical Research (in Indonesia: Konsep dan Aplikasi PLS (Partial Least Square) untuk Penelitian Empiris)*. Yogyakarta: BPFE Yogyakarta, 2009.
- [64] I. Ghozali, *Model Persamaan Structural Konsep dan Aplikasi dengan Program AMOS 16 (in Indonesia: Structural Equation Model Concepts and Applications with the program AMOS 16.)* Semarang: Badan Penerbit Universitas Diponegoro, 2007.
- [65] R. Chavda, “General Issues in Data Management,” in *Handbook of Research Methods in Public Administration*, K. Yang and J. G. Miller, Eds. New Work: CRC Press, 2007, pp. 293–302. doi: 10.1201/9781420013276.ch19.
- [66] U. Cuesta-Cambra, L. Martínez-Martínez, and J. I. Niño-González, “An analysis of pro-vaccine and antivaccine information on social networks and the internet: Visual and emotional patterns,” *Profesional de la Informacion*, vol. 28, no. 2, 2019, doi: 10.3145/epi.2019.mar.17.

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