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An Intergroup Perspective on Antecedents of Negative Attitudes Towards Covid-19 Vaccine: The Role of Conspiratorial Beliefs, Perceived Assumptive International Collaboration, and Vaccine National Glorification

Abstract: Although the COVID-19 vaccine has been recommended as the safer and more effective prevention for COVID-19 disease relative to other alternative medications, yet across the globe, many people are resistant to receiving it. Setting out to explain such a paradox, we conducted an online survey among a sample of Indonesians ($N = 4758$) when the World Health Organisation (WHO) granted authorisations for the clinical trial of various vaccines against COVID-19. The results revealed that participants' support for theories that the COVID-19 vaccine is invented to harm their nation (i.e., COVID-19 vaccine conspiratorial beliefs) positively corresponded with the perceptions that international collaboration in the COVID-19 vaccine clinical trial is not aligned with their nation's actual needs (i.e., the perceived assumptive international collaboration) and negative attitudes towards the vaccine. In turn, the perceived assumptive international collaboration was positively related to negative attitudes towards COVID-19 vaccine. We also showed that the positive relationship between COVID-19 vaccine conspiratorial beliefs and the perceived assumptive international collaboration in the vaccine clinical trial was more prominent among participants who were strongly resistant to take vaccines supplied by other countries due to national pride (i.e., vaccine national glorification).

Keywords: *vaccine national glorification, COVID-19 vaccine conspiratorial beliefs, assumptive international collaboration, negative attitudes towards COVID-19 vaccine.*

As of August 02, 2021, more than one and a half years since its first emergence in Wuhan, China, in December 2019, COVID-19 has affected 199 million people and claimed 4 million lives across the globe ("COVID-19 coronavirus pandemic", 2021). To contain the pandemic, World Health Organisation (WHO) has officially approved the COVID-19 vaccine and asserted the urgency of all people around the world to get vaccinated ("Cascini et al., 2021). Yet despite the importance of COVID-19 vaccination, people have displayed negative attitudes towards the COVID-19 vaccine (Lazarus et al., 2021; Sallam, 2021), which undoubtedly poses a major problem for the effectiveness of global efforts to manage the COVID-19 pandemic (Dhama, 2021).

Recent psychological research (Bogart et al., 2021; Palamenghi et al., 2020; Troiano & Nardi, 2021) has revealed that at the core of anti-vaccine attitudes is

people's mistrust of the government and health authorities concerning their policies or actions in dealing with COVID-19. Because mistrust against the authorities is closely related to conspiratorial beliefs (Pierre, 2020), it comes as no surprise that significant numbers of people across the globe have endorsed COVID-19 conspiracy theories (Henley & McIntyre, 2020), which are a strong, robust antecedent of negative attitudes towards COVID-19 vaccine (Ullah et al., 2021). The investigation of the intergroup-based correlates of people's negative attitudes towards the COVID-19 vaccine is sorely needed, which is less well understood due to the shortage of relevant previous research.

The goal of our work was to fill such a research gap in which we proposed the intergroup-based correlates of people's resistance to COVID-19 vaccination. In doing so, we first examined how much the endorsement of theories

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suggesting that the COVID-19 vaccine is produced to harm people's nation (i.e., COVID-19 vaccine conspiratorial beliefs) and the perceptions that international collaboration in testing the efficacy and safety of the COVID-19 vaccine do not reflect the actual aspirations and needs of people's nation (i.e., the perceived assumptive international collaboration) are linked to negative attitudes towards the COVID-19 vaccine. Second, we examined how much the desire to self-invent the COVID-19 vaccine to boost the superiority of a nation vis-à-vis other nations (i.e., COVID-19 vaccine national glorification), is related to the perceived assumptive international collaboration in the COVID-19 vaccine clinical trial. Finally, we also examined the extent to which vaccine national glorification moderates the positive relationship between COVID-19 vaccine conspiratorial beliefs and the perceived assumptive international collaboration in the COVID-19 clinical trial.

NEGATIVE ATTITUDES TOWARDS COVID-19 VACCINE AND COVID-19 VACCINE CONSPIRATORIAL BELIEFS

When the COVID-19 vaccine was still being developed or in the phase of the clinical trial, research had been conducted to assess attitudes towards the vaccine when it would be available. During this period, before WHO approved the clinical trial of some COVID-19 vaccine candidates as of December 08, 2020 (Voysey et al., 2021), empirical studies showed that people's mistrust of the efficacy and safety of the vaccine underpinned negative attitudes towards the COVID-19 vaccine (Cordina et al., 2021; Kreps, et al., 2021; Paul et al., 2021). Because mistrust in and of itself is strongly associated with conspiratorial beliefs (Pierre, 2020), it makes sense to find that the spread of conspiratorial beliefs during the times of the COVID-19 crisis spares no continent (Shahsavari, 2020), so is beliefs in the COVID-19 vaccine conspiracies that went viral either in developing countries or developed countries (Islam et al., 2021). This is because societal crisis generates new problems with no clear solution, exacerbating feelings of uncertainty. Beliefs in conspiracy theories serve as an epistemic motive to provide people with a simplified answer to the unprecedented problems, which can assuage the uncertainty (Van Prooijen & Douglas, 2017).

Existing literature conceptualises conspiracy theories in multifarious ways, which can be broadly categorised into context-based conspiracy theories and conspiracy mentality. Context-based conspiracy theories may take shape via general and specific conspiracy theories (Brotherton et al., 2013; Drinkwater et al., 2020). Beliefs in general context-based conspiracy theories denote people's endorsement for conspiracies that pertain to events that extend beyond any particular cultures or communities such as terrorist acts, the emergence and contagion of viruses, and murders of public figures. Beliefs in specific context-based conspiracy theories constitute people's endorsement for conspiracies about

particular real-world events, such as the 9/11 attacks, the spread of HIV, the assassination of Princess Diana. Conspiracy mentality denotes people's engagement in conspiracist ideation, which reflects the vulnerability to form ideas about conspiracy theories that are not bound to historical, cultural, and geographical contexts (Bruder et al., 2013).

The focus of our work is on specific context-based conspiracy theories, which we specifically capture in the term intergroup conspiratorial beliefs about the COVID-19 vaccine. The well-cited definition of intergroup conspiracy theories describes that behind the scenes, certain groups have worked in concert to harm the ingroup (van Prooijen & van Vugt, 2018). Accordingly, intergroup conspiratorial beliefs contain a socio-existential element of threat perceptions, depicting how the outgroups undermine the existence of the ingroup (van Mulukom et al., 2020; van Prooijen & Song, 2021). Intergroup conflict is also assumed (van Prooijen & van Vugt, 2018) and has been found (Mashuri et al., 2020) to breed intergroup conspiratorial beliefs. For example, from the initial stages of the COVID-19 pandemic, China and the United States of America (the U.S.) have traded conspiracy theories (Sardarizadeh & Robinson, 2020). Through the so-called Wuhan lab-leak theory, the U.S. accused China of masterminding COVID-19 (Sudworth, 2021), whereas China connected the origins of the new disease to the U.S. military laboratory in Maryland (Kinetz, 2021). And recently, Chinese state media has spread conspiracy theories to question the efficacy of Western COVID-19 vaccines, including the Pfizer-BioNTech COVID-19 vaccine licensed by the U.S. (Wu, 2021).

In addition to intergroup conflict, group status may also provoke intergroup conspiratorial beliefs, with a low-status group being prone to believe in conspiracies by powerful outgroups (Crocker et al., 1999). Beliefs in conspiracy theories implicate the powerless ingroup's propensity to blame relatively powerful outgroups such as governments, industrial companies, and scientific communities (Nera et al., 2021). Indeed, the inventors of COVID-19 vaccines are mostly developed, superpower countries such as Russia, the U.S., the United Kingdom, Germany, and China (Dodd et al., 2021). In developing countries, the advanced countries become the target of COVID-19 vaccine conspiratorial beliefs. In Pakistan for example, people believe in theories that the COVID-19 vaccine is created by the Western power to rule the Islamic world (Khan et al., 2020). Across African nations, one prevalent conspiracy theory holds that the Covid-19 vaccines are designed by superpower countries to harm Africans and extinguish Africa's population (Olatunji et al., 2020). In Indonesia, COVID-19 vaccine conspiracy theories are linked to sentiments against the Chinese, an ethnic minority group that frequently becomes the victims of prejudice and violence in that country (Yuniar, 2021).

The Adaptive-conspiracism hypothesis (van Prooijen & van Vugt, 2018) suggests that conspiratorial beliefs, marked with the suspicion of a nefarious plot by certain groups, activate hostility against the allegedly conspiring

groups. Building upon this rationale, greater COVID-19 vaccine conspiratorial beliefs may be associated with greater resistance to the vaccine (Wirawan et al., 2021). We, therefore, hypothesised that belief in theories that the COVID-19 vaccine was invented to surreptitiously harm Indonesia would be positively related to negative attitudes towards the COVID-19 vaccine (*Hypothesis 1*).

THE PERCEIVED ASSUMPTIVE INTERNATIONAL COLLABORATION

Before approving the usage of COVID-19 vaccines, the WHO requires that the quality of the vaccines should be reviewed through clinical trials (Kim, 2021). To facilitate this research protocol, WHO launched the project of “Solidarity” as a multinational clinical trial, to synchronise expedited and sound evaluations of the safety and efficacy of COVID-19 vaccine candidates (Figuroa et al., 2021). Indonesia was a Southeast Asian country to be the first to take part in the clinical trial (Karyana et al., 2021). A rumour then spread in social media that in the clinical trial, Indonesia became ‘a guinea pig’ for the Chinese vaccine Sinovac (Arianto, 2021; Zainuddin & Febriyanti, 2021). The same rumour is also ubiquitous in other countries via the narrative that the clinical trial targets low-status, minority groups as ‘guinea pigs’ (Bhattacharya, 2021; Etutu & Goodman, 2021; Islam et al., 2021). This implies that some people have negative perceptions of The WHO’s solidarity project.

Indeed, literature (Chou & Stauffer, 2016; Nadler & Halabi, 2006) suggests that prosocial initiatives from another group such as offers of intergroup help and cooperation may meet some resistance because they are perceived as assumptive. More specifically, the perceived assumptive intergroup help and collaboration mean how the recipients feel that they do not request the prosocial actions by the providers. As a consequence, the providers’ prosocial actions are deemed as not being in line with the recipients’ actual needs and harbouring an ulterior motive to assert the first group’s dominance and control over the latter group (Halabi & Nadler, 2017). This perceived assumptive attribution to such prosocial initiatives is more chronically experienced by the recipients than the providers or initiators of intergroup collaboration due to the impression that in this intergroup relation, the status of the first group is lower than the latter group (Halabi & Nadler, 2010). Consistent with this argumentation, previous studies have demonstrated how a low-status group feels incompetent, depressed, and threatened on their self-esteem when receiving help from a high-status group that is perceived as an assumptive prosocial action (Halabi et al., 2011). Applying this insight to the context of our work and considering Indonesia as the recipient and not as the initiator of the COVID-19 vaccine clinical trial, we argued that if such international collaboration is perceived as assumptive, then negative attitudes towards the COVID-19 vaccine are highly likely. Based on this rationale, we hypothesised that more negative evaluations of the COVID-19 vaccine clinical trial as assumptive collaboration

would be associated with more negative attitudes towards the COVID-19 vaccine (*Hypothesis 2*).

Intergroup collaboration is a form of collective reconciliation in which groups in conflict aspire to build and maintain peace (Mashuri, 2019). However, to make it feasible, intergroup reconciliation requires that disputing parties should develop constructive cognitive orientations such as trust (Nadler & Liviatan, 2006). Given its association with more mistrust, conspiratorial beliefs hinder intergroup collaboration as was evidenced in the research by Petrović (2019). More elaborated evidence to this contention was shown in the research by Mashuri et al. (2020) wherein ingroup’s beliefs in high-status outgroup’s conspiracies motivate the former group to negatively evaluate prosocial initiatives from the latter group. Applying this insight to the context of the present work, we argued that the more people believe in COVID-19 vaccine conspiracy theories the more they perceive the COVID-19 vaccine clinical trial as assumptive international collaboration. Based on this rationale, we hypothesised that COVID-19 vaccine conspiratorial beliefs would positively correspond with the perceived assumptive international collaboration in the COVID-19 vaccine clinical trial (*Hypothesis 3*).

VACCINE NATIONAL GLORIFICATION

Several months when the new disease began spreading, some nations (e.g., China, the U.S., European countries) had competed to be the first producer of COVID-19 vaccine (Sanger et al., 2020). On one side, this competition brings a positive outcome with the invention of the COVID-19 vaccine (Kreier, 2021). It, however, also bears an element of nationalism to the global pandemic, which brings a negative consequence that takes shape via an excessive ambition of a country to be able to create a COVID-19 vaccine on its own, bypassing the scientific procedures and stages that should be carried out (Toxvaerd & Yates, 2021). An example is Russia as the country that first created and used a COVID-19 vaccine under the name Sputnik V without large-scale testing and transparently published test results (Burki, 2020). In Indonesia, the former Minister of Health Terawan has initiated the production of what is known as the Nusantara vaccine. The problem emerged when the Indonesian Food and Drug Authority (Indonesian: Badan Pengawas Obat dan Makanan/BPOM) stated that the phase 1 clinical trial of the Nusantara vaccine was not aligned with scientific principles so that requested phase 2 clinical trial was not permitted (Sari, 2021). In response to the decision, Terawan remained adamant to obtain the phase 3 clinical trial approval, which was rejected by BPOM (Sagita, 2021).

The phenomenon put forward above signifies so-called vaccine national glorification. Roccas et al. (2006) differentiated between two forms of national identification. The first is national attachment denoting general, positive feelings (e.g., pride, solidarity) to a nation. The second is national glorification as a defensive national identification

that reflects a biased perception of intergroup reality wherein people feel that their nation is superior compared to other nations. As argued and empirically found by Roccas et al. (2006), these two modes of national identification tap into distinct constructs. People who strongly glorify their nation may not feel particularly attached to it. Vice versa, people who strongly feel attached to their nation may not glorify all aspects connected to the superordinate group.

National pride is negatively related to people's willingness to take the perspective of other groups (Mashuri et al., 2017) or other nations (Berndsen et al., 2018), as well as international trust (Chung, 2015). Applying these insights to the context of our work, vaccine national glorification may be related to people's tendency to prioritise their own country, which ultimately poses a hurdle to the promotion of global solidarity in containing the COVID-19 pandemic (Pratiwi & Tsauro, 2021). Due to this attenuated global solidarity, national glorification is likely to be positively associated with beliefs in conspiracy theories that by inventing the COVID-19 vaccine, developed countries are suspected of having harmful intentions to the recipients. Moreover, national glorifiers may think of international collaboration in dealing with the pandemic as reflecting poorly upon their own nation (Rupar, 2020). This implies that when people glorify the capability of their nation to invent the COVID-19 vaccine, it is likely that they negatively interpret any prosocial initiative from the outgroups including international collaboration in the COVID-19 vaccine clinical trial. Building upon these arguments, we hypothesised that COVID-19 vaccine national glorification would be positively related to either COVID-19 vaccine conspiratorial beliefs (*Hypothesis 4a*) or the perceived assumptive international collaboration in the COVID-19 vaccine clinical trial (*Hypothesis 4b*).

We also posit that COVID-19 national glorification moderates the extent to which COVID-19 conspiratorial beliefs can positively correspond with the perceived assumptive international collaboration. Group identity moderator (Verkuyten, 2009) suggests that, especially among high identifiers than low identifiers, intergroup threats positively correspond with more negative attitudes against the outgroups. These relationships should be stronger when such group identification takes the form of glorification rather than group attachment. This is because national glorification compared to national attachment is related to more intergroup threat perceptions (Berndsen et al., 2017). As extant literature shows that intergroup threat perceptions are positively associated with beliefs in theories that outgroups have secretly coalesced to harm the ingroup (Mashuri et al., 2016; Mashuri & Zaduqisti, 2015). Due to their susceptibility to intergroup perceptions, in contrast to low national glorifiers, high national glorifiers should be more likely to exhibit animosity towards the reputedly conspiring outgroups. Based on this rationale, in the context of our research, we generated a moderation hypothesis in which the positive relationship between COVID-19 vaccine conspiratorial beliefs and the

perceived assumptive international collaboration in the COVID-19 clinical trial would be stronger among participants who highly glorified the invention of COVID-19 vaccine by their nation (*Hypothesis 5*).

THE CONTEXT OF THE PRESENT STUDY

To test the ideas as put forward above, we conducted an empirical study in Indonesia, one of the developing countries constituting the world's fourth most populous nation and third-largest democracy (Mohamad et al., 2021). From October 19, 2020, until November 06, 2020, when COVID-19 vaccines were not yet approved by WHO and were in the phase of the clinical trial. To get the approval, the vaccines needed to be tested such that WHO persuaded each country to participate in the clinical trial ("WHO Solidarity Trial Consortium", 2021). During this period, a survey by the collaboration among Indonesian Ministry of Health, National Immunization Technical Advisory Groups (NITAG), the United Nations Children's Fund (UNICEF), and WHO in November 2020 revealed that of more than 112 thousand participants, 7.6% were unwilling whereas 27.6% were unsure to be vaccinated against COVID-19 ("COVID-19 Vaccine Acceptance Survey in Indonesia", 2020).

Even after the Indonesian government officially started the vaccination program on 13 January 2021, the survey by the Indonesian Ministry of Health from April 2021 to May 2021 showed that 36% of Indonesian citizens rejected and felt sceptic towards the COVID-19 vaccine ("Survei 33 Persen Masyarakat Menolak Vaksin Covid-19, Pendidikan Tinggi Terbanyak", 2021). The most current survey by LSI (Indonesian: Lembaga Survei Indonesia) from June 20, 2021, until June 25, 2021, showed a consistent finding in which of the 1.200 unvaccinated respondents, 37.4% were hesitant about getting the Covid-19 vaccine (Nasution, 2021). These observations suggest that negative attitudes towards the COVID-19 vaccine are a relevant topic of investigation within the Indonesian context. In what follows, using a correlational study, we examine the intergroup-based correlates of such anti-attitudes towards the COVID-19 vaccine.

METHOD

Participants and Design

In total, we recruited 4758 participants (3068 females, 1693 males; $M_{\text{age}} = 22.06$, $SD_{\text{age}} = 7.65$). Most of the participants self-reported as Muslim (85%), ethnically Javanese (73%), student (77%), having a low income (64%) and graduating from senior high school (73%). Participants took part voluntarily in return for no reward, who were recruited based on convenient sampling. Through an online survey disseminated via various social media, we designed our research as a correlational study in which participants were presented with questions to measure each variable.

Procedure and Measures

The online survey commenced with informed consent. After confirming their agreement to take part in the research, participants were asked to report their monthly income and educational level. The next part of the survey was short information released by WHO (“172 countries and multiple candidate vaccines engaged in COVID-19 vaccine Global Access Facility”, 2020) in which some developed countries such as the U.S., Germany, United Kingdom, and China, have initiated to invent COVID-19 vaccine. Upon reading the information, participants were asked to indicate their agreement on the 7-Likert type answering scale, which ranged from 1 (*not at all*) to 7 (*very much*), with a series of questions to assess all variables in this research. Scores were created by averaging participants’ answers on each of the variables, which included *COVID-19 vaccine conspiratorial beliefs*, *vaccine national glorification*, *the perceived assumptive international collaboration*, and *negative attitudes towards the COVID-19 vaccine*.

We assessed COVID-19 vaccine conspiratorial beliefs with six items (e.g., “Developed countries that are researching to invent COVID-19 vaccine have conspired to weaken Indonesia”; “Developed countries that are researching to invent COVID-19 vaccines have conspired to dominate Indonesia”; $\omega = .97$, 95% confidence interval [CI] [.96, .97]), self-developed by the authors to suit the context of the present work. Vaccine national glorification was assessed with eight items (Indonesia must create its COVID-19 vaccine such that other nations can learn a lot from Indonesia”; Indonesia should create its COVID-19 vaccine because relative to other nations, Indonesia is a very moral nation”; $\omega = .89$, 95% CI [.89, .90]), which we adapted from Roccas et al. (2006).¹

Participants were then presented with the second information, cited from reputable online news in Indonesia, about the Indonesian government’s agreement to take part in the clinical trial of COVID-19 vaccine candidates invented by some developed countries as mentioned in the previous section. This international collaboration aimed to test the efficacy and safety of the vaccines before approval for use. Subsequently following this information, participants were presented with four items (“International collaboration related to the COVID-19 vaccine is offered one-sidedly; the Indonesian people do not factually need such collaboration”; “International collaboration related to the COVID-19 vaccine clinical trial is offered by force, without asking Indonesian people whether or not they need such collaboration”; $\omega = .94$, 95% CI [.93, .94]), to assess the perceived assumptive international collaboration in the COVID-19 clinical trial. We self-developed this scale by taking into account relevant literature (Halabi, 2011; Nadler, 2015) suggesting that assumptive intergroup collaboration is perceived as unsolicited prosocial actions by another group in the sense that it goes beyond recipients’ needs. Finally, we assessed negative attitudes towards the COVID-19 vaccine with five items (“COVID-19 vaccine is unsafe and cannot be trusted to contain the spread of the disease.”; “COVID-19 vaccine has not been tested conclusively in the laboratory so it is not safe for

distribution to the general public.”; $\omega = .94$, 95% CI [.94, .95]), which we self-developed based on some credible surveys in Indonesia (Makdori, 2021; Manafe, 2021). Upon completing the survey, participants were asked to indicate their gender, age, status as a student or non-student, ethnicity, and religion.

RESULTS

Measurement Model

Following a recommendation by Gatignon (2003), we used confirmatory factor analysis (CFA) to assess convergent validity and discriminant validity of the four variables in this research (i.e., vaccine national glorification, COVID-19 vaccine conspiratorial beliefs, the perceived assumptive international collaboration, and negative attitudes towards COVID-19 vaccine). In doing so, we analysed the data in this research using Mplus version 7 with MLM estimator. Literature (Muthén & Muthén, 1998-2015) suggests that MLM is recommendable for data that violate the assumption of multivariate normality.

We proposed the four-factor-oblique model as the hypothesised measurement model denoting that the four variables under investigation are unique albeit interrelated constructs (see Figure 1 below). We assessed the

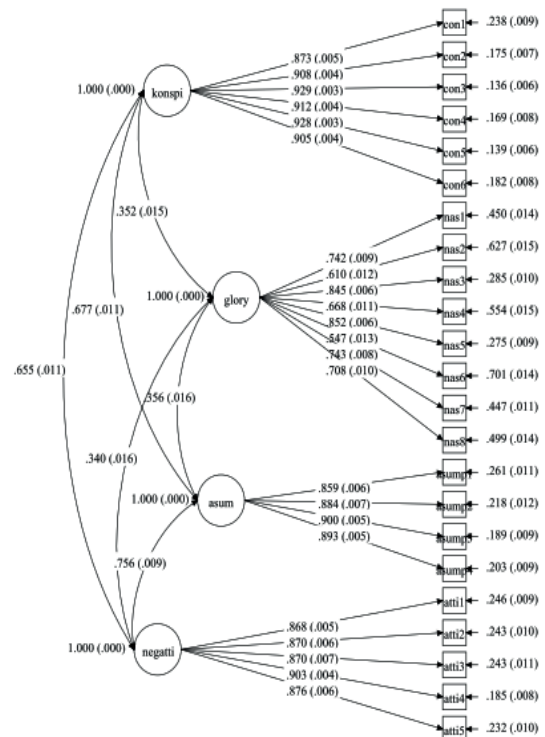


Figure 1. The Results of the Hypothesised Four-Factor Oblique Measurement Model in this Research.

Note. konspi = COVID-19 vaccine conspiratorial beliefs, glory = COVID-19 vaccine national glorification, asum = perceived assumptive international collaboration, negatti = negative attitudes towards COVID-19 vaccine, con1-con6 = item 1-item 6 of COVID-19 vaccine conspiratorial beliefs, nas1-nas8 = item 1-item 8 of vaccine national glorification; asump1-asump4 = item 1- Item 4 of assumptive international collaboration, att1-att5 = item 1-item5 of negative attitudes towards COVID-19 vaccine. Numbers in the parenthesis were standardised errors. All factors loadings are significant at $p < .001$.

hypothesised measurement model by comparing it with two alternative measurement models. The first alternative measurement model is the four-factor-orthogonal model (see Figure 3 in the Appendix), which was specified by constraining the correlations among the four variables to zero. The second alternative measurement model was the one-factor model (see Figure 4 in the Appendix), which was specified by allowing all items within each of the four variables to load into a single latent factor.

We used some fit indices including the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker Lewis Index (TLI) to examine the goodness of fits of the hypothesised measurement model. If the hypothesised model has an RMSEA that is less than 0.10 (MacCallum et al., 1996) and CFI as well TLI that equals 0.90 or above (Schreiber et al, 2006), then the hypothesised measurement model is said to have an acceptable fit to the data. The evidence of convergent validity can be obtained when the goodness of fits of the hypothesised measurement model is significantly better than the goodness of fits of the first alternative measurement model. Discriminant validity is adequate when the goodness of fits of the hypothesised measurement model is significantly better than the goodness of fits of the second alternative measurement model. In comparing these models, we used the chi-square difference test for nested models (Burnham & Anderson, 2004) via the following link: <http://www.thestatisticalmind.com/calculators/SBChiSquareDifferenceTest.htm>

The results revealed that the hypothesised four-factor oblique model, $\chi^2(74) = 237.29$, fitted the data significantly better than either the first alternative measurement model, $\chi^2(77) = 251.55$, $\Delta\chi^2(3) = 14.05$, $p = .003$, or the second alternative measurement model, $\chi^2(77) = 1493.28$, $\Delta\chi^2(3) = 966.09$, $p < .001$. The goodness of fits of the hypothesised measurement model was also acceptable, RMSEA = 0.05, CFI = 0.96, TLI = 0.95.

Hypothesis testing

To test each of the hypotheses in this research, we used correlations among latent variables presented in Figure 1. As shown in Figure 1, participants' COVID-19 vaccine conspiratorial beliefs positively corresponded with

negative attitudes towards COVID-19 vaccine ($\beta = .66$, $SE = 0.01$, $p < .001$, 95% CI [.63, .68]), so did the perceived assumptive international collaboration in the COVID-19 clinical trial ($\beta = .76$, $SE = 0.01$, $p < .001$, 95% CI [.74, .77]). These findings were hence in line with Hypothesis 1 and Hypothesis 2 respectively. Substantiating Hypothesis 3, COVID-19 vaccine conspiratorial beliefs positively corresponded with the perceived assumptive international collaboration in the COVID-19 clinical trial ($\beta = .68$, $SE = 0.01$, $p < .001$, 95% CI [.66, .70]).

The next findings revealed that vaccine national glorification was positively related to both COVID-19 vaccine conspiratorial beliefs ($\beta = .35$, $SE = 0.02$, $p < .001$, 95% CI [.32, .38]), corroborating Hypothesis 4a, and the perceived assumptive international collaboration in the COVID-19 clinical trial ($\beta = .36$, $SE = 0.02$, $p < .001$, 95% CI [.33, .39]), confirming Hypothesis 4b.

To test Hypothesis 5, we conducted a multigroup analysis in which the relationships among COVID-19 conspiratorial beliefs, the perceived assumptive international collaboration in the COVID-19 vaccine clinical trial, and negative attitudes towards COVID-19 vaccine were differentiated into high and low vaccine national glorifiers. In doing so, following Iacobucci et al. (2015), we grouped the data using median split into two categories: high vaccine national identifiers (above the median) and low vaccine national glorifiers (below the median). Before running this multigroup analysis, however, following recommendations (Putnick & Bornstein, 2016; Wang & Wang 2012), we tested the assumption of measurement invariance based on the two levels of vaccine national glorification. Four nested, competing models were tested, including configural invariance (i.e., setting factor intercepts equal across high and low vaccine national glorifiers), metric invariance (i.e., setting factor intercepts and factor loadings equal across high and low vaccine national glorifiers), strong measurement invariance (i.e., setting factor intercepts, factor loadings, and item intercepts equal across high and low vaccine national glorifiers), and strict measurement invariance (i.e., setting factor intercepts, factor loadings, item intercepts, and error variances equal across high and low vaccine national glorifiers). The results are presented in Table 1 below.

Table 1. The Results of Tests of Measurement Invariance of The Hypothesised Model Based on High Versus Low Vaccine National Glorifiers

Model	CFI	RMSEA (90% CI)	SRMR	Δ CFI	Δ RMSEA	Δ SRMR	Decision
M1: Configural Invariance	.976	.052 (.049, .055)	.021	—	—	—	—
M2: Metric Invariance	.975	.051 (.048, .054)	.022	.001	.001	.001	Accept
M3: Strong measurement invariance	.975	.050 (.047, .053)	.023	.002	.002	.001	Accept
M4: Strict measurement invariance	.972	.051 (.048, .053)	.024	.004	.001	.003	Accept

The assumption of measurement invariance is met if the ΔCFI between the configural invariance model and its three competing models (i.e., metric invariance model, strong measurement invariance model, and strict measurement invariance model) is no more than .01, with $\Delta RMSEA$ being no more than .015 and $\Delta SRMR$ (Standardized Root Mean Squared Residual) being no more than .030 (Chen, 2007). As shown in Table 1, all of these criteria are met, allowing us to run the multigroup analysis.

Figure 2 below presents the multigroup analysis, to look at the role of vaccine national glorification in moderating the relationship between COVID-19 vaccine conspiratorial beliefs and the perceived assumptive international collaboration in the COVID-19 vaccine clinical trial. The results showed that, substantiating Hypothesis 5, the positive relationship between COVID-19 vaccine conspiratorial beliefs and the perceived assumptive international collaboration in the COVID-19 vaccine clinical trial was stronger among high vaccine national glorifiers ($\beta = .70$, $SE = 0.02$, $p < .001$, 95% CI [.67, .73]) than low vaccine national glorifiers ($\beta = .60$, $SE = 0.02$, $p = .001$, 95% CI [.57, .64]), Wald test[1] = 147.07, $p < .001$).

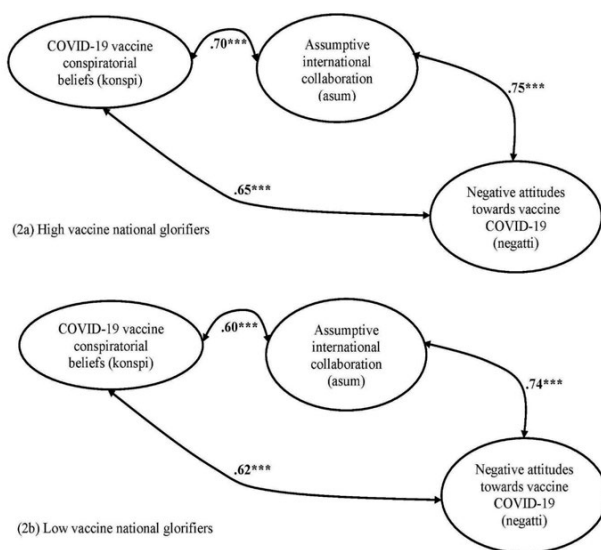


Figure 2. Results of a Multigroup Model on the Relationships among Variables within the Hypothesised Model for Participants High in Vaccine National Glorification (Above the Median) and Low in Vaccine National Glorification (Below the Median).

Note. Numbers in the model are standardised path coefficients. All factor loadings within the hypothesised model were significant at $p < .001$, both among participants with high and low vaccine national glorifiers. However, the factor loadings are not displayed for figure simplicity.

DISCUSSION

We conducted this research to examine intergroup factors that arguably explain people's negative attitudes towards the COVID-19 vaccine, in the context when COVID-19 vaccine candidates were being in the phase of the clinical trial. We found as expected that more COVID-19

vaccine conspiratorial beliefs significantly corresponded with more perceived assumptive international collaboration in the COVID-19 vaccine clinical trial and negative attitudes towards the COVID-19 vaccine. In turn, the perceived assumptive international collaboration in the COVID-19 vaccine clinical trial was positively related to negative attitudes towards the COVID-19 vaccine. Vaccine national glorification as hypothesised was positively associated with COVID-19 vaccine conspiratorial beliefs and the perceived assumptive international collaboration in the COVID-19 vaccine clinical trial. The final finding showed how the positive association between COVID-19 vaccine conspiratorial beliefs and the perceived assumptive international collaboration was more pronounced among high vaccine national glorifiers in contrast to low vaccine national glorifiers.

Theoretical Implications

The finding in this research on the positive relationship between beliefs in theories that COVID-19 vaccine is invented by developed, powerful countries to harm the national ingroup and the perceptions of the COVID-19 clinical trial as assumptive international collaboration is aligned with upward conspiracy theories (Nera et al., 2021). By engaging in upward conspiracy theories, the powerless ingroup is motivated to challenge the domination of the conspiring outgroups. To articulate this motivation, the ingroup develops intergroup antagonism by questioning the existence (e.g., policies or actions) of the outgroup. Through this theoretical framework, national ingroup members' construal of the COVID-19 vaccine clinical trial as assumptive international collaboration serves as the opposition of this particular group against powerful countries that, by inventing the vaccine, are accused of conspiring to harm their group. With this opposition, the national ingroup members construe international collaboration in the COVID-19 vaccine clinical trial as an unsolicited prosocial initiative offered to them without any evidence indicating their actual need. In sum, COVID-19 related conspiracy theories may bring detrimental consequences for intergroup relations at the current difficult times (Douglas, 2021).

The perceptions of the COVID-19 vaccine clinical trial as assumptive international collaboration in this research positively corresponded with negative attitudes towards the vaccine. Indeed, the Strategic OUTgroup Helping (SOUTH) model (van Leeuwen, 2017) contends that prosocial initiatives may not warrant the favourable outcome when the providers feel that their prosocial action is needed whereas the recipients feel otherwise. This perceived need unalignment happens particularly when the recipient views that prosocial initiatives are driven by a strategic motive, such that they are perceived as harmful to the reputation or power of the recipient (van Leeuwen & Täuber, 2010). This perceived strategic motive of prosocial initiatives can be attributable to the recipient's beliefs in the provider's conspiracies, which eventually evoke the first group's hostility against the latter group (Mashuri et al., 2020). Congruent with these arguments,

the present work uncovered the positive relationship between the perceptions of the COVID-19 clinical trial as the assumptive international collaboration and people's negative attitudes towards the vaccine.

Vaccine national glorification in this work was significantly correlated with more beliefs in COVID-19 vaccine conspiracy theories and the perceived assumptive international collaboration in the COVID-19 clinical trial. As high-glorifying ingroup members are more likely to subjectively experience loss of significance, that is, events or situations that are perceived as humiliation that undermine the ingroup's reputation, they are vulnerable to extremism (Jasko et al., 2019). Extremists are characterised by cognitive simplicity and intolerance. Cognitive simplicity renders a clear-cut, black-and-white perceptual feature of social and political realities, which make people vulnerable to conspiratorial beliefs (van Prooijen & Krouwel, 2019). Intolerance is rooted in a biased judgment on the moral superiority of the ingroup group and vice versa, the moral inferiority of the outgroup, which inhibits intergroup cooperation (van Prooijen et al., 2015). These arguments are taken to suggest that vaccine national glorification reflects extremism. Thus, people with high vaccine national glorification are prone to suspicious views of the COVID-19 vaccine and more likely to resist international collaboration in the COVID-19 vaccine clinical trial as were found in this present work.

Literature on moral disengagement (Leidner et al., 2010) suggests that group glorifiers tend to justify the wrongdoings of their group against another group. Hence, group glorifiers tend to harbour hostile attitudes towards the outgroup, and they do so more strongly when feeling threatened by the outgroup (Rovenpor et al., 2016). Conspiratorial beliefs are closely related to intergroup threat perceptions, whereas high group glorifiers feel strongly implicated by the threats. Accordingly, the negative impact of conspiratorial beliefs on intergroup relations should be more pronounced among high than low group identifiers. In line with these reasons, the final finding in this research showed that COVID-19 vaccine conspiratorial beliefs were positively related to the perceived assumptive international collaboration in the COVID-19 clinical trial wherein this relationship was more pronounced among high than low vaccine national glorifiers.

Limitations and Recommendations for Future Research

Conspiratorial beliefs in our work pointed to the powerful outgroups, i.e., developed countries that invent the COVID-19 vaccine. However, the current pandemic has also given rise to conspiratorial beliefs in a powerful ingroup, that is, the government, which has been accused of, for instance, concealing the real information about COVID-19 (Allington et al., 2021; Freeman et al., 2020). Moreover, COVID-19 vaccine conspiracy theories in the previous research (e.g., Islam et al., 2021) have been connected to issues beyond politics such as the implantation of advanced technologies (artificial intelligence,

microchips) into humans together with the COVID-19 vaccine to monitor the population. Follow-up research hence could assess how much such other forms of COVID-19 vaccine conspiratorial beliefs may uniquely explain people's negative attitudes towards the COVID-19 vaccine, as compared with outgroup-directed conspiratorial beliefs on which we focused our investigation in the present work.

Vaccine national glorification in our work refers to feelings of superiority relative to other nations when a national group can invent its COVID-19 vaccine. The anecdotal record shows that such form of defensive positivity towards a nation at the current pandemic also manifests itself in the tendencies of developed and high-income countries to prioritize vaccination for their people, while not caring about access to COVID-19 vaccines for people in developing and poor countries (Jha et al., 2021). European Union countries and the U.S. for example, have purchased the COVID-19 vaccine twice their total population (Burki, 2021). This kind of ingroup-serving motive of vaccine national glorification deserves assessing in future studies, along with the superiority-oriented vaccine national glorification in the present work, to examine their potentially different role in hindering efforts to handle the COVID-19 pandemic globally.

Our work was conducted when the COVID-19 vaccine was being in the phase of the clinical trial. After the clinical trial when more proofs and transparent publications about the efficacy of the COVID-19 vaccine are available, people's hesitancy to take on the vaccine may be reduced (Darko, 2021). This argument implies that people's perceptions and attitudes towards the COVID-19 vaccine may vary with time (Arce et al., 2021). Taking into account this projection, future studies are needed to test the extent to which the relationships among vaccine national glorification, international collaboration in dealing with the pandemic, and negative attitudes towards the COVID-19 vaccine can generalise to the latest development when the COVID-19 vaccination program has begun worldwide.

Participants in this research are relatively young and predominantly female, who were drawn from convenient sampling. These confined characteristics of the sample and the usage of non-random sampling may limit the generalisability of this research to the Indonesian population. To overcome these drawbacks, future studies interested in replicating or extending the hypothesised model in our work can recruit participants with more demographic balance in terms of age and gender who are selected based on random or probability sampling.

Furthermore, our work employed correlational research, which makes claims of the cause-and-effect relationship among variables in this research unwarranted. To overcome this drawback, follow-up research can implement experimentation by manipulating instead of measuring conspiracy theories of the COVID-19 vaccine. This experimental research design is of use to examine the extent to which COVID-19 vaccine conspiracy theories not only correspond with, as was assessed in this research

but also affect or influence greater levels of the perceived assumptive international collaboration and negative attitudes towards the COVID-19 vaccine.

Practical implications

In this research, support for conspiracy theories accusing developed countries of having hidden, malevolent intentions against the ingroup in producing the COVID-19 vaccine significantly explained people's tendencies to resist COVID-19 vaccination. Based on this finding, to promote pro-attitudes towards COVID-19 vaccination policymakers should devise social interventions that can effectively tackle such conspiratorial beliefs. One promising intervention is to create alternative information to help wider members of society question the veracity of the COVID-19 vaccine conspiracy theories (Lazić & Žeželj, 2021). This counter-narrative should be disseminated by the government through various media including television, radio, and, more importantly, online media. This is because vaccine conspiracy theories in general (Wang et al., 2019) and COVID-19 vaccine conspiracy theories in particular (Islam et al., 2021) expeditiously go "viral". The bias in the form of 'preaching to the choir', however, may become the hurdle for this kind of intervention. This bias indicates how the intervention is less likely to be successful among people who already distrust the government. These people tend to regard the government as untrustworthy and ultimately accuse it of masterminding the COVID-19 vaccine conspiracies (Islam et al., 2020). Thus, to enhance their persuasiveness, the counter-narratives should be communicated by those whom people perceive as more representing public interests in society than the government per se (Solnick et al., 2020).

NOTE

¹Following the procedure by Hayes and Coutts (2020), using Mplus version 7 Omega (ω) was calculated as a reliability coefficient of latent constructs or variables in this research.

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APPENDIX

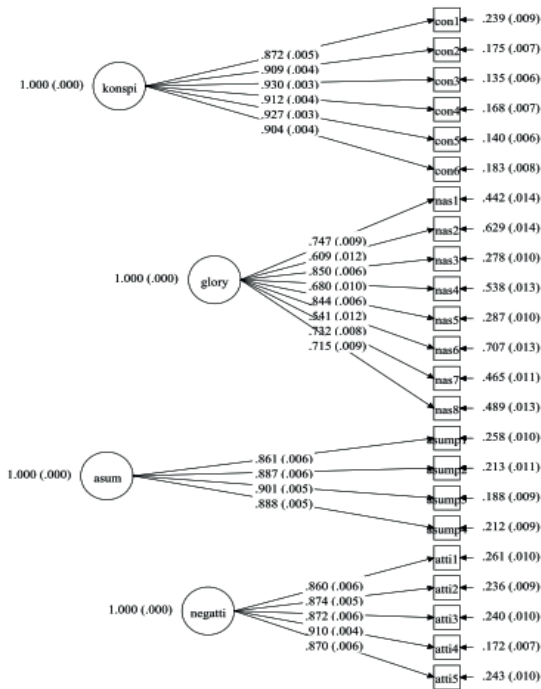


Figure 3. The Results of the Four-Factor Orthogonal Measurement Model in this Research

Note. konspi = COVID-19 vaccine conspiratorial beliefs, glory = COVID-19 vaccine national glorification, asum = perceived assumptive international collaboration, negatti = negative attitudes towards COVID-19 vaccine, con1-con6 = item 1-item 6 of COVID-19 vaccine conspiratorial beliefs, nas1-nas8 = item 1-item 8 of vaccine national glorification; asump1-asump4 = item 1- Item 4 of assumptive international collaboration, att1-att5 = item 1-item5 of negative attitudes towards COVID-19 vaccine. Numbers in the parenthesis were standardised errors. All factors loadings are significant at $p < .001$.

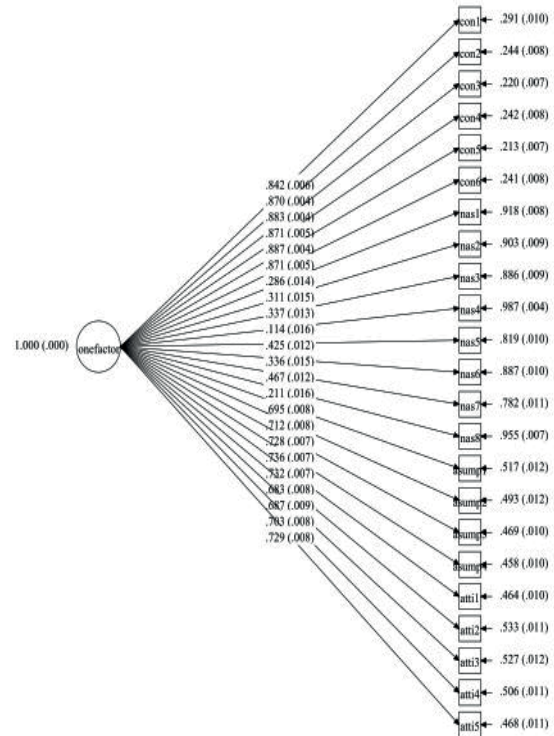


Figure 4. The Results of the One-Factor Model in this Research

Note. onefactor = the single latent factor, con1-con6 = item 1-item 6 of COVID-19 vaccine conspiratorial beliefs, nas1-nas8 = item 1-item 8 of vaccine national glorification; asump1-asump4 = item 1- Item 4 of assumptive international collaboration, att1-att5 = item 1-item5 of negative attitudes towards COVID-19 vaccine. Numbers in the parenthesis were standardised errors. All factors loadings are significant at $p < .001$.