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REGULAR ARTICLE

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# Cross-cultural investigation of the relationship between social identity, trusting the system, COVID-19 vaccine adherence and conspiratorial beliefs

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**Abstract**

Understanding how individual beliefs and societal values influence support for measures to prevent COVID-19 transmission and risk is vital to developing and implementing effective prevention policies. Surges in COVID-19 infections continue to be prevalent worldwide, and strategies to address the increase in vaccine hesitancy and related conspiracy theories are enacted globally. Using the lenses of the social identity approach and system justification theory, we examined how individual-level conceptualizations of identity, system legitimacy, conspiracy beliefs and trust in science, government and healthcare influence an uptick in COVID-19 vaccine adherence. Data from an international survey of adults from China, the Philippines and the United States ($N=358$; Study 1) and a six-country two-wave stratified online sample ($N=6138$; Study 2) allowed the present research to investigate how cultural values and governmental policies intersect with COVID-19 risk perception and vaccine hesitancy. The most robust findings were: (1) identifying with a superordinate global identity was associated with greater vaccine adherence; (2) having a stronger subordinate national identity was associated with greater vaccine hesitancy; and (3) the association between having a strong national identity and the endorsement of COVID-19 conspiracy theories was mediated by system justification. The results presented are used to discuss strategies for increasing vaccine uptake globally for future pandemics.

**KEYWORDS**

conspiracy theories, COVID-19, global human identity, national identity, system justification, vaccine hesitancy

## 1 | INTRODUCTION

The COVID-19 pandemic, which emerged in Wuhan in November 2019 and quickly spread worldwide, was declared a pandemic by the World Health Organization (WHO) in March 2020 (Wu et al., 2021). It has led to over 777 million confirmed cases globally as of March 3, 2025. The pandemic has reshaped global health systems, economies and daily life, which has led to a lasting impact on the so-called 'new normal' in a post-pandemic world (Selvam et al., 2024).

With the ever-increasing numbers of COVID-19 cases and deaths worldwide, psychologists have attempted to study a range of topics relating to the COVID-19 pandemic. While vaccines emerged as a crucial tool in controlling the COVID-19 virus, adherence to vaccination remains a multifaceted issue influenced by broader psychological, social and political factors, beyond individual decision-making. This complexity is further magnified in a cross-cultural context, where historical experiences, trust in institutions and sociopolitical climates shape vaccine attitudes and behaviours in various ways (Romate et al., 2022; Zimmermann et al., 2023). In addition, a PsycINFO search for 'COVID-19' on 3 March 2025, returned over 58,296 studies. Expanding it to include 'vaccine hesitancy' yielded 871 studies. However, a final search adding 'cross-cultural' narrowed the results to only 14 studies on this crucial topic. This highlights a striking gap in the psychological literature, overlooking the importance of cultural variation in the expression of COVID-19 vaccine hesitancy and adherence, which can help mitigate future global pandemics.

## 1.1 | Vaccine adherence and hesitancy

Vaccine adherence is the extent to which individuals follow recommended vaccination schedules that include receiving all necessary doses within the prescribed timeframe. Several factors have been found to influence adherence, such as socio-demographic characteristics, health beliefs and environmental factors (De Araújo et al., 2024). Vaccine hesitancy, on the other hand, is defined as the reluctance to get vaccinated despite availability (MacDonald, 2015). This remains a significant concern, with only 65.7% of the global population and 15.9% in low-income countries receiving at least one COVID-19 vaccine dose (Pires, 2022).

Due to the COVID-19 pandemic, various health protocols (e.g. wearing face masks, social distancing, lockdowns and quarantines) were imposed by governments worldwide to mitigate the spread of the virus. Apart from these protocols, vaccination was seen as a solution to control the global health crisis as vaccinations are 'one of the most cost-effective ways of avoiding diseases' (World Health Organization [WHO], 2019). Vaccinations are widely recognized as the most effective measure for preventing infectious diseases (Greenwood, 2014), with their impact including the reduction, elimination and even eradication of specific diseases (Baussano et al., 2021; Carrasquilla et al., 2020; Kauffmann et al., 2020; Moffett, 2020; Schleiff et al., 2020; Subasinghe et al., 2020). Additionally, vaccinations played a key role in the overall decline in mortality rates over the past two centuries (Li et al., 2021) and are estimated to prevent 3–5 million deaths annually (Kolobova et al., 2022; Martinelli et al., 2020; Pollard & Bijker, 2021; WHO, 2019). However, despite these successes, there has been a global increase in vaccine hesitancy, particularly following the public availability of COVID-19 vaccines and the more recent release of booster shots (Nuwarda et al., 2022). In line with this, understanding this global rise in vaccine hesitancy through cross-cultural research is of utmost importance to ensure the continued effectiveness of vaccination programmes worldwide.

A global survey from June 2020 revealed promising levels of potential COVID-19 vaccine acceptance (55–89%; see Lazarus et al., 2021). In a more recent 23-country study, Lazarus et al. (2023) found that vaccine adherence increased by 5.2% in 2022 compared to 2021, yet they found that vaccine hesitancy increased in eight of the countries surveyed, ranging from 1% (United Kingdom) to 21% (South Africa). However, many of those who have been vaccinated still report hesitancy around boosters for themselves and their children.[1] The reasons for COVID-19 vaccine acceptance and hesitancy remain complex as new variants emerge, adding further complexity (Abdool Karim & de Oliveira, 2021). With new vaccines being developed, it will be critical to have transparent top-down communication about the facts of diseases and vaccines and address the concerns of the public (Machingaidze & Wiysonge, 2021).

Trust plays a crucial role in shaping these behaviours, as confidence in government institutions, healthcare systems and scientific expertise influences public perceptions of vaccine safety and effectiveness, influencing vaccine adherence and hesitancy (Jennings et al., 2021; Jones et al., 2021; Liu & Chu, 2022; Quinn et al., 2019; Rozek et al., 2021; Sapienza & Falcone, 2022). Social identity, which refers to how individuals align with particular groups based on several factors like social norms, also shapes vaccine attitudes (Heiman et al., 2022; Zimmermann et al., 2023). Specifically, Carrieri et al. (2023) found that trust in science and health institutions is negatively associated with hesitancy, while general distrust in institutions (e.g. government) and vaccines was found to contribute to vaccine hesitancy (Jennings et al., 2021). Moreover, in a systematic review of the willingness to receive the COVID-19 vaccine, several factors were associated with vaccine hesitancy, including education level, income, occupation, race/ethnicity, trust in the healthcare system, political ideology, perceived threat of COVID-19 and perceived vaccine efficacy (Wake, 2021). Sallam et al. (2021) found that the dangerous effects of COVID-19 misinformation and conspiracy beliefs (e.g. vaccines are intended to implant microchips into humans, and that vaccines may lead to infertility) were manifested in vaccine hesitancy when they examined the association between COVID-19 vaccine acceptance and conspiracy beliefs. The scepticism surrounding the COVID-19 vaccines arises from historical injustices, misinformation or political polarization, further complicating adherence (Agbede, 2024; Bolsen & Palm, 2022; Buckingham et al., 2022; Hsu et al., 2022).

## 1.2 | Conspiracy beliefs and public health

Conspiracy beliefs are assumptions without verifiable evidence that powerful groups secretly manipulate significant events or situations with harmful intent. A primary feature of conspiracy theories is that they

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provide causal explanations for distressing societal issues. Hofstadter (2012) argues that conspiracist ideation is rooted in a general tendency to explain and rationalize complex real-world phenomena into a coherent set of assumptions about the existence of a powerful and evil other. These have been widely linked to vaccine hesitancy, which undermines public health efforts.

Against the backdrop of pervasive uncertainty during the pandemic, conspiratorial beliefs have proliferated, serving as alternative explanations for COVID-19 and its vaccine. Some argue that conspiracy beliefs sometimes serve the purpose of justifying specific values associated with one's political and social identities (Jolley et al., 2018). Moreover, Chen, Zhang, et al. (2022) argue that conspiracy beliefs provide both causal explanations of major events (fostering uncertainty-reduction) and safeguard the image of the status quo within a given nation from a threat that is believed to challenge it, such as COVID-19. Furthermore, they found that those who prioritized their national identity over other social identities were more likely to endorse conspiracy beliefs about the COVID-19 pandemic to explain the uncertainty surrounding the development, spread, and response to COVID-19. Examples of such include: (1) glorifying the self and the in-group by placing blame for negative consequences of the pandemic on out-groups (Thomas et al., 2024); (2) creating an explanation for the origins of COVID-19 (Leibovitz et al., 2021); and (3) delegitimizing the pandemic and its perceived threat (Douglas, 2021; Pummerer et al., 2022). Each of these served the purpose of protecting the legitimacy of the nation-state and its corresponding in-group, consistent with recent research on the system-justifying capabilities of conspiracy beliefs (Mao et al., 2024). Apart from this, the speed at which vaccines and other pharmaceutical options were developed to combat COVID-19 has caused many to question their efficacy and safety (Haque & Pant, 2020). These conspiracy beliefs and misunderstandings about vaccine development and its side effects further exacerbate vaccine hesitancy (Jennings et al., 2021).

When people are in threatening situations that cause anxiety and uncertainty, like the COVID-19 pandemic, conspiracy ideas tend to proliferate as a coping mechanism (Freeman et al., 2020). To combat this lack of knowledge and uncertainty about COVID-19, some individuals sought outside conspiratorial explanations centring around the origin of the virus and economic gain, while others focused on the local and national reaction to the pandemic (Gogarty & Hagle, 2020). The pandemic met many of these psychological factors for individuals, and as such, has been a hotbed for conspiracy beliefs, which are believed to have perpetuated a general sense of mistrust towards a variety of perceived corrupt political and scientific systems (Douglas, 2021). Moreover, citizens depended on their local and national governments to provide clear and transparent guidelines for vaccine information and social protocols for the collective good during the pandemic (Ramkissoon, 2021). Unfortunately, clarity about COVID-19 and its vaccine failed to satisfy many people's needs (Lazarus et al., 2023). The belief in conspiracy theories has been identified as a factor that erodes prosocial behaviour and trust in authorities.

## 1.3 | Cross-cultural differences

Public health behaviours, including responses to the COVID-19 pandemic, are shaped by an interplay of various factors such as cultural norms, political systems and levels of trust in institutions (Alsaqqa, 2022; Badman et al., 2022; Friedler, 2021). Research highlights a heterogeneity in how countries managed the health crisis, which is influenced by their government systems and cultural orientations (Barceló et al., 2022; Steinert et al., 2022). Nations with centralized, authoritarian governments often implemented strict lockdowns and vaccination mandates, leveraging state control to enforce compliance (Ha et al., 2024). In contrast, democratic societies had more decentralized responses, in which public trust and voluntary adherence played a critical role in pandemic mitigation (Zahariadis et al., 2022). These governance differences influenced vaccine uptake, public compliance with health measures and the spread of conspiracy beliefs.

Cultural dimensions further shaped pandemic responses. Individualistic societies, which prioritize personal autonomy and self-determination, often saw higher levels of vaccine hesitancy due to concerns over personal freedom and distrust in government interventions (Leong et al., 2022; Maaravi et al., 2021; Steinert et al., 2022). In contrast, collectivistic cultures, where interdependence and social harmony are emphasized, exhibited higher compliance with public health recommendations, as community well-being was prioritized over individual choice (Leong et al., 2022; Maaravi et al., 2021; Xiao, 2021). This cultural distinction explains why certain countries experienced widespread vaccine acceptance, while others faced persistent resistance and misinformation.

## 1.4 | Theoretical framework: integrating SIA and SJT

To understand the cross-cultural relationships that have contributed to COVID-19 vaccine hesitancy and conspiratorial beliefs, our theoretical framework draws from Social Identity Theory (SIT), Self-Categorization Theory (SCT; Tajfel, 1981; Tajfel & Turner, 1979), which are formerly known to make up the Social Identity Approach (SIA; Abrams & Hogg, 1990). We also draw from the theoretical perspective of System Justification Theory (SJT; Jost & Banaji, 1994). SIT emphasizes the psychological motivations and consequences of group membership, while SCT explains how and why individuals identify and act as part of a group. SJT, on the other hand, proposes that individuals are motivated to see the systems they depend on (i.e. social, political and economic) and the corresponding status quo as just, fair and legitimate (Jost & Banaji, 1994; Valdes, 2022; Valdes et al., 2023). By combining SIA and SJT, we use an integrative theoretical lens to investigate the development of in-group cohesion and out-group antipathy concerning COVID-19-related beliefs.

In the context of public health, national identification (i.e. how strongly one aligns with their nation) shapes perceptions of government policies and influences vaccine attitudes. In this vein, COVID-19-related attitudes have caused a divide across political ideological lines in certain contexts (Jiang et al., 2021), with political ideology viewed as a form of motivated social cognition (Jost et al., 2003). In these contexts, in-group similarities and out-group differences in beliefs about COVID-19 and its perceived threat are influenced by political and social identities (Heiman et al., 2022; Lewis, 2020).

Across cultures, citizens quickly identified with either a pro- or anti-COVID mitigation in-group (Dryhurst et al., 2022; Johnson et al., 2020; Rutjens et al., 2021), signalled by support for or rejection of mitigation strategies (e.g. mask-wearing, social distancing, quarantining and vaccinating; Jetten et al., 2020; Korn et al., 2020). Sceptics, aligning with the anti-camp, viewed these strategies as threats to civil liberties due to government mandates (Boggio et al., 2023; Bonetto et al., 2020).

This self-categorization communicated two key messages, especially in Western societies. First, political identity shaped attitudes towards COVID-19 mitigation, with progressives (i.e. liberals) more likely to embrace medical and social mitigating strategies, while conservatives remained sceptical (Azevedo et al., 2023; Jetten et al., 2020; Jost, 2021; Kerr et al., 2021). Second, those supporting mitigating strategies showed a connection with a prevailing global identity over a subordinate national one, emphasizing responsibility and prosocial behaviours for the greater good (Grimalda et al., 2023).

Global human identification is an individual's conceptualization of their self-concept towards a global collective and to see themselves as interchangeable components of a larger social unit (Buchan et al., 2011; McFarland et al., 2019). Previous research has found that individuals who possess such a social identity with the world community tend to be more cooperative, prosocial, supportive of human rights, transcend parochial interests and overall reduce human suffering (Buchan et al., 2009, 2011; McFarland et al., 2019). Grimalda et al. (2023) found that a strong sense of global identity is positively correlated with cooperative behaviour for the collective good compared to those with stronger attachments towards local and national identities.

On the other hand, Jost (2020) argues that a strong sense of nationalism fosters reliance on the prevailing social system during times of uncertainty, such as a pandemic. This unpredictability intensifies the motivation to defend and justify the status quo. If anti-mitigation beliefs dominate, challenges to these may be seen as threats to societal norms (Jost, 2020). Similarly, those favouring stability over social change may turn to COVID-19 conspiracy theories to cope with uncertainty (Jost, 2020). In particular, system-justifiers often view social stances sceptically, perceiving them as threats to national sovereignty and cultural stability (Berkebile-Weinberg et al., 2024; Norris & Inglehart, 2019).

Furthermore, political ideology also plays an important role in shaping and engaging in prosocial behaviour, particularly in the context of global identification and responses to public health measures (Grünhage & Reuter, 2021). While global identification fosters a sense of moral responsibility and solidarity beyond national borders, individuals' willingness to act on these inclinations may be shaped by their ideological orientation. Research suggests that individuals on the political right, who often prioritize national loyalty and resistance to change, may be less inclined to embrace a global human identity (Jost et al., 2003). Consequently, even if global identification is associated with prosocial behaviours such as vaccine adherence, its influence may be contingent on individuals' ideological leanings. Those on the political left, who tend to endorse more universalistic moral foundations, may more readily translate global identification into prosocial behaviours such as embracing vaccines for the greater good, while those on the right may be less responsive to this influence (Brewer et al., 2023).

Investigating how political ideology moderates the relationship between global identification and vaccine adherence is crucial amid societal shifts catalysed by the COVID-19 pandemic. Global identification fosters a sense of belonging beyond national borders, potentially influencing health behaviours like vaccine adherence. In relation, research suggests that individuals on the political right are more likely to resist such changes, reflecting a preference for maintaining established norms. By testing whether global identification buffers these ideological differences, we aim to determine whether superordinate identities (i.e. global identification) can help overcome ideological barriers to public health cooperation (Jost et al., 2003). Examining this interplay is essential given that political ideologies shape responses to societal changes and public health messages.

Radnitz (2022) found that motivated reasoning from geopolitical identities correlates with higher conspiracy beliefs, which underscores the role of identity in conspiratorial thinking. Conspiracy theories draw on social identity and uniqueness motives (Sternisko et al., 2020) and stem from individual, relational and collective social identities (Biddlestone et al., 2021). They can reinforce support for the social order when threatened (Jolley et al., 2018) and bolster nationalistic ideals by framing out-groups as disruptors (Mao et al., 2021, 2024). Thus, a stronger national identity may predict system justification and belief in pandemic-related conspiracy theories (Chen, Ng, et al., 2022; Chen, Zhang, et al., 2022; Jutzi et al., 2020).

## 1.5 | Overview of studies

We investigate the underlying associations between vaccine adherence and COVID-19-related conspiracy theories and then test a theoretical mediational model of conspiracy beliefs using system justification and national identity in two cross-cultural studies comprised of seven societies. Furthermore, for exploratory purposes, we will investigate whether the relationship between global identification and COVID-19 vaccine adherence is moderated by political ideology. We aim to use the theoretical lenses of SIA and SJT to understand the associations that identity, political ideology, system legitimacy and trust have with vaccine hesitancy and COVID-19 conspiratorial beliefs.

As previous research suggests, national identity and system justification are deeply intertwined, often influencing the development and endorsement of conspiracy beliefs. National identification can reinforce system justification, especially when aligned with one's political ideology. Right-wing individuals tend to exhibit higher levels of national identification and system justification compared to left-wing individuals (Moscato et al., 2021). This fosters pro-government sentiments and support for governmental actions. However, when there is a mismatch between personal and governmental ideologies, national identification may lead to scepticism and the propagation of conspiratorial beliefs to resist perceived threats to the status quo (Bertin et al., 2022; Federico et al., 2018; Górska et al., 2023; Schneider & Haas, 2021). Ultimately, national identification is associated with system justification, as a strong sense of national identity can foster a motivation to perceive the existing social order as legitimate and stable. This tendency may be particularly pronounced in times of crises, when maintaining a positive national image and protecting the status quo from change/threat become especially salient (Jutzi et al., 2020; Mao et al., 2024).

During the COVID-19 pandemic, conspiracy beliefs have taken centre stage as they served as mechanisms for individuals to make sense of the rapid changes and uncertainties associated with the global health crisis (Larsen et al., 2021; Šrol et al., 2021). These beliefs are often entangled with identity, as individuals who feel marginalized or distrustful of mainstream narratives may turn to alternative explanations that align with their identity. In addition, system justification is also linked to conspiracy beliefs, which means that justifying the system can paradoxically increase susceptibility to conspiracy theories that offer alternative explanations for perceived threats while still maintaining the legitimacy of the status quo (Mao et al., 2021, 2024).

While national identification can predict more productive tendencies under certain conditions, the scope of our study does not extend to examining these aspects. Instead, we focus on how national identity, system justification and conspiracy beliefs interact, especially in the context of the COVID-19 pandemic, in which identity-based conspiracy beliefs have significantly influenced public perception and behaviour (Earnshaw et al., 2020; Imhoff & Lamberty, 2020; Pummerer et al., 2022). Moreover, we examine the indirect effect of national identification on conspiracy beliefs through system justification, given that system-justifying tendencies may shape how individuals interpret information and adopt conspiracy narratives that align with both their identity and their motivation to uphold the system (Mao et al., 2024; Sternisko et al., 2020).

## 1.6 | Hypotheses

Building on the cross-cultural differences in pandemic responses, the current study explores how various factors influence public health behaviours. Therefore, we propose the following hypotheses:

> **Hypothesis 1.** *Global identification, political ideology (i.e. political left-leaning) and trust in governmental, healthcare and science systems in combating the COVID-19 pandemic will positively predict vaccine adherence, while identifying with a national identity and endorsing COVID-19 conspiratorial beliefs will negatively predict vaccine adherence.*

> **Hypothesis 2.** *Global identification, political ideology (i.e. politically left-leaning) and trust in governmental, healthcare and scientific systems will positively predict perceived vaccine safety. Conversely, national identification and endorsing COVID-19 conspiratorial beliefs will negatively predict perceived vaccine safety.*

> **Hypothesis 3.** *The relationship between national identification and COVID-19-related conspiracy beliefs will be mediated by one's level of system justification.*

## 1.7 | Data analysis

We employed individual-level bivariate correlational, binomial logistic regression, multiple regression and multilevel regressions to test our hypotheses. During all regression analyses, we treated our predictor, mediating, moderating and outcome variables as directly observed, while controlling for age and gender.[2]

## 2 | STUDY 1

The COVID-19 pandemic exposed stark differences in how nations respond to global health crises shaped by their political systems, culture and government. Based on the theoretical and empirical antecedents outlined in the current study, we aim to investigate the aforementioned hypotheses using convenience sampling in the authors' home countries—the United States, the Philippines and China—as case studies. This is across a spectrum of cultural contexts, contrasting western, educated, industrialized, rich and democratic (WEIRD) nations (e.g. the United States) with non-WEIRD societies (e.g. the Philippines and China). These countries were chosen to represent distinct social, political, economic and cultural environments, which are pivotal in shaping public attitudes and behaviours, particularly concerning COVID-19 and vaccine adherence during the pandemic (Mathieu et al., 2021). The United States, with its decentralized federal system and strong individualist culture, faced significant challenges in coordinating a unified response (Birkland et al., 2021; Kincaid & Leckrone, 2021). Political polarization and resistance to government mandates contributed to inconsistencies in containment efforts. In contrast, China's centralized authoritarian government enabled swift and stringent measures, leveraging collectivist values and state control to enforce compliance (Gao & Zhang, 2021; Jing & Xue, 2021). Meanwhile, the Philippines, a democracy that adopted a heavily militarized COVID-19 response, faced challenges related to governance, healthcare infrastructure and enforcement strategies (Thompson, 2022; Zech et al., 2023). This allows for a nuanced exploration of how independent (i.e. individualistic) versus interdependent (i.e. collectivistic) cultural orientations influence the variables under study (Henrich et al., 2010; Markus & Kitayama, 1991).

### 2.1 | Methods

#### 2.1.1 | Participants and procedures

An a priori power analysis was conducted using G*Power (Faul et al., 2007) to determine a sufficient per-country total sample size. Considering an alpha of 0.05 and power set to ($1-\beta=0.80$), a sample of 243 (81 per country) was the minimum total sample size necessary to detect moderate effects ($f^2=0.2$) for our regression analyses. Additionally, to assess power for multiple group comparisons, we conducted a separate power analysis using the same alpha, desired power and effect size criteria, specifying a three-group comparison. This analysis indicated that a total sample size of 246 (82 per country) was required to detect a moderate effect ($f=0.2$). Participants were recruited from the United States, the Philippines and China using Prolific and Qualtrics. When Prolific was unavailable, we used convenience snowball sampling in which participants were referred to the Qualtrics survey. Data were collected from 3 July to 20 August 2022.

During the second half of 2022, the global situation had improved significantly compared to earlier stages of the COVID-19 pandemic. However, the approach to managing COVID-19 varied widely, which reflects differences in cultural factors, government approaches and healthcare resources (Tang et al., 2022; Wong et al., 2022). While some nations, particularly in East and Southeast Asia, adopted strict measures, Western countries adopted a more relaxed approach (Amul et al., 2022; Tang et al., 2022). However, mask-wearing, social distancing, and other health protocols remained in place to varying degrees due to concerns about new variants of COVID-19 emerging.

The surveys were given in the dominant language of each country. Non-English survey translations were performed by a coalition of different researchers through the back-translation method (Behlin & Law, 2000). See Table 1 for descriptive demographics per country.

#### 2.1.2 | Missing data analysis

The analyses of all three countries involved missing data ranging from 0% to 33% across 14 variables of interest. During data collection, 114 out of 358 cases were incomplete. This proportion fell within the expected range for multicultural studies at 21% (Bai & Quadros de Oliveira, 2011). Notably, a significant portion of missing data involved the variables of education level and political orientation. To address this, we adopted multiple imputation, a state-of-the-art method for managing missing

**TABLE 1** Age and gender by country ($N=385$).

| | | | Gender | | | |
|---|---|---|---|---|---|---|
| **Country** | ***N*** | **Age *M* (SD)** | **Male** | **Female** | **Non-Binary** | **Prefer Not to Say** |
| China | 136 | 29 (7.4) | 35 | 97 | 2 | 2 |
| Philippines | 129 | 21 (4.3) | 35 | 87 | 2 | 5 |
| United States | 93 | 31 (11.3) | 33 | 50 | 8 | 2 |

data (Manly & Wells, 2015), generating and analysing 40 imputed datasets. This improves accuracy and statistical power compared to alternative techniques. We used fully conditional specification with linear regression with the random forest method in the mice 3.13 package for imputation (van Buuren & Groothuis-Oudshoorn, 2011). Finally, results were pooled across the imputed datasets and combined with non-imputed data for analyses.

## 2.2 | Measures

### 2.2.1 | Vaccine hesitancy/adherence

Participants' COVID-19 vaccine hesitancy was assessed by asking if they would take the developed vaccine that was made available to them in their country. This includes the single item ‘Will you take the vaccine developed once available in (Country)’ where each country name was inserted into the parentheses. Responses were originally coded from 1 (No) to 2 (Yes), which we then recoded using dummy coding (0 = No, 1 = Yes).

### 2.2.2 | Vaccine safety

Participants' ideas about COVID-19 vaccine safety were assessed using the single item ‘In your opinion, how safe is the COVID-19 vaccine developed in your country’. Responses were given on a range from 0 (Not safe) to 100 (Incredibly safe).

### 2.2.3 | System justification

A brief version of the System Justification Scale (Kay & Jost, 2003) was used. This includes the following four items: ‘In general, I find society to be fair’, ‘In general, (my country's) political system operates as it should’, ‘Everyone in my country has a fair shot at wealth and happiness’ and ‘(My country's) society is set up so that people usually get what they deserve’, where each country name was inserted into the parentheses. Responses were given on a range of 1 (Disagree completely) to 7 (Agree completely). A mean system justification score was calculated for each participant, which formed a highly reliable scale ($\alpha = 0.87$).

### 2.2.4 | Global identification

A cross-culturally stable 10-item questionnaire by Türken and Rudmin (2013) was used to measure global identity. Items 1 to 5 are positively keyed, while items 6 through 10 are negatively keyed, which were then reverse-scored. Responses were given on a range from 1 (Strongly disagree) to 7 (Strongly agree). Sample items include ‘I consider myself more as a citizen of the world than a citizen of some nation’ and ‘(My country) is one of the best in the world’, where a given country was inserted into the parentheses. A mean global identification score was calculated for each participant, which formed a reliable scale ($\alpha = 0.71$).

### 2.2.5 | National identification

National identification was assessed using the following two items that intend to measure identity centrality and national identification (Bonetto et al., 2020; Postmes et al., 2013). This includes the following items: ‘I identify as (Nationality)’, where a given nationality was inserted into the parentheses, and ‘I identify with my national group identity’. Responses were given on a range of 1 (Strongly disagree) to 11 (Strongly agree). A mean national identification score was calculated for each participant, which formed a reliable scale ($\alpha = 0.76$).

### 2.2.6 | Trust in government

A 3-item questionnaire from Han et al.'s (2021) study that measures trust in the government to combat COVID-19 was used. This includes the following items ‘In general, how much do you trust the government to take the right measures to deal with the coronavirus pandemic’, ‘I think the government is able to fight the coronavirus’ and ‘I think that the government is able to fight the economic and financial consequences of the coronavirus’. Responses were given on a range of 1 (not at all) to 5 (A great deal). A mean trust in government score was calculated for each participant, which formed a highly reliable scale ($\alpha = 0.82$).

### 2.2.7 | Trust in healthcare

Participants' trust in their national healthcare system was assessed using Zhao et al.'s (2019a, 2019b) 3-item questionnaire. This includes the following items: ‘In general, how much confidence do you have in the health care system in (fill in Country name here)’, ‘In general, how would you rate your health’ and ‘How satisfied or dissatisfied were you with the treatment you received when you last visited a doctor’. Responses were given on a range of 1 (No confidence at all/poor/completely dissatisfied) to 5 (Complete confidence/excellent/completely satisfied). A mean trust in healthcare score was calculated for each participant, which formed a reliable scale ($\alpha = 0.60$).

### 2.2.8 | Trust in science

McCright et al.'s (2013) questionnaire was used to measure the participants' trust in science. This included the following four items where participants were asked 'How much do you distrust or trust scientists to:' (1) 'Create knowledge that is unbiased and accurate', (2) 'Create knowledge that is useful', (3) 'Advise government officials on policy' and (4) 'Inform the public on important issues'. Responses were given on a range of 1 (Completely distrust) to 5 (Completely trust). A mean trust in science score was calculated for each participant, which formed a highly reliable scale ($\alpha = 0.82$).

### 2.2.9 | Conspiracy beliefs

Conspiracy beliefs about the COVID-19 pandemic were assessed using Jutzi et al.'s (2020) single item 'To what extent do you believe that COVID-19 was developed as a biological weapon, but due to a laboratory accident, it was spread among US/China/Philippines own population?' Responses range from 1 (Definitely not true) to 5 (Definitely true).

### 2.2.10 | Political ideology

Participants' political ideology was assessed using the single item 'Where would place yourself on a scale from 0 (Strong right-leaning) to 10 (Strong left-leaning) on political issues'. Using a single-item scale to measure political ideology has been a common practice in political psychology literature, providing substantive evidence for the validity of the measure both across national and international research (Imhoff et al., 2022; van der Linden et al., 2021).

### 2.2.11 | Education

The education level of participants was determined using the single item 'What is the highest level of education you have completed?' Responses ranged from 1 (Some high school or less) to 6 (Graduate or professional degree).

### 2.2.12 | Age and gender

Participants' age was identified using the single item 'What is your age?', while participants' gender was assessed using the single item 'What is your gender?' Responses were given on the following scale (0 = female, 1 = male).

## 2.3 | Results

### 2.3.1 | Measurement invariance

We employed multigroup confirmatory factor analyses to assess measurement invariance for our multiply imputed data across three countries. The analyses focused on two 3-factor models, the first of which included system justification, global identification and national identification. The second 3-factor model included trust in science, healthcare and government. For more details on the results of this analysis, please see the Appendix S1.

### 2.3.2 | Preliminary analyses

Descriptive statistics and bivariate correlations for all variables of interest at the individual level are presented in Tables S1–S3 for China, the Philippines and the United States (see Appendix S1).

### 2.3.3 | Regression analyses

We first opted to conduct a binomial logistic regression to examine the likelihood estimation of our predictors on COVID-19 vaccine hesitancy/adherence, while controlling for age and gender. Compared to Chinese individuals (the reference group), only Filipinos were significantly less likely to take the COVID-19 vaccine ($\beta = -0.87$, SE = 0.37, $\chi^2 = 5.66$, OR = 0.42, $p = 0.03$). Meanwhile, Americans did not significantly differ from Chinese participants in their likelihood of vaccine adherence/hesitancy ($\beta = -0.21$, SE = 0.41, $\chi^2 = 5.66$, OR = 0.96, $p = 0.93$) Interestingly, trust in government ($\beta = -0.19$, SE = 0.16, $\chi^2 = 3.15$, OR = 0.82, $p = 0.26$), healthcare ($\beta = -0.05$, SE = 0.18, $\chi^2 = 0.07$, OR = 0.95, $p = 0.77$) and science ($\beta = -0.03$, SE = 0.15, $\chi^2 = 0.13$, OR = 1.07, $p = 0.84$) were found to be non-significant predictors of vaccine adherence/hesitancy. Similarly, both conspiratorial beliefs ($\beta = 0.15$, SE = 0.17, $\chi^2 = 0.82$, OR = 1.17, $p = 0.37$) and political ideology ($\beta = -0.01$, SE = 0.17, $\chi^2 = 0.006$, OR = 0.99, $p = 0.94$) were found to be non-significant related to vaccine adherence/hesitancy. However, a divergent relationship was discovered for identifying more strongly with either a global or national identity. In this vein, identifying with a global identity was more likely to be vaccine adherent ($\beta = 0.35$, SE = 0.18, $\chi^2 = 8.81$, OR = 1.43, $p = 0.04$), while a stronger national identity was more likely to be vaccine hesitant ($\beta = -0.40$, SE = 0.16, $\chi^2 = 6.94$, OR = 0.67, $p = 0.01$). For exploratory purposes, we wanted to assess whether the likelihood of being vaccine adherent/hesitant for those who possessed a stronger global identification was dependent on their political ideology. However,

**TABLE 2** Logistic regression analysis for vaccine adherence.

| Predictors | $\beta$ | SE $\beta$ | $Z$ | Wald's $\chi^2$ | $p$ | Odds ratio | 95% CI lower | 95% CI upper |
|---|---|---|---|---|---|---|---|---|
| Global Identification | 0.35 | 0.18 | 2.01 | 8.81 | 0.04** | 1.43 | 1.01 | 2.03 |
| National Identification | −0.40 | 0.16 | −2.51 | 6.94 | 0.01** | 0.67 | 0.49 | 0.91 |
| Trust in Government | −0.19 | 0.16 | 1.71 | 3.15 | 0.26 | 0.82 | 0.58 | 1.16 |
| Trust in Healthcare | −0.05 | 0.18 | 0.257 | 0.07 | 0.77 | 0.95 | 0.68 | 1.33 |
| Trust in Science | −0.03 | 0.15 | 0.356 | 0.13 | 0.84 | 1.07 | 0.72 | 1.57 |
| Political Ideology | −0.01 | 0.17 | −0.080 | 0.006 | 0.94 | 0.99 | 0.71 | 1.37 |
| Conspiracy | 0.15 | 0.17 | 0.905 | 0.82 | 0.37 | 1.17 | 0.84 | 1.64 |
| Age | 0.01 | 0.18 | 0.01 | 0.003 | 0.95 | 1.01 | 0.70 | 1.42 |
| Gender | 0.28 | 0.24 | 1.20 | 1.43 | 0.09 | 0.67 | 0.41 | 1.06 |
| Country: Philippines | −0.87 | 0.37 | −2.34 | 5.66 | 0.03** | 2.33 | 1.10 | 5.08 |
| Country: USA | −0.21 | 0.41 | −0.52 | 5.66 | 0.93 | 0.96 | 0.40 | 2.25 |
| Global Identification × Political Ideology | −0.14 | 0.12 | −1.12 | 1.26 | 0.26 | 0.87 | 0.68 | 1.11 |

*Note*: More positive estimates indicate higher odds of being vaccine adherent, Cox and Snell $R^2=0.060$. Nagelkerke $R^2$ (Max rescaled $R^2$)=0.101. McFadden $R^2=0.064$. Akaike Information Criterion (AIC)=337.09. China is set to the reference group. ** indicates $p<0.05$.

**TABLE 3** Multiple regression predicting perceived vaccine safety.

| | Perceived Vaccine Safety | | |
|---|---|---|---|
| **Predictors** | **Estimates** | **95% CI** | $p$ |
| (Intercept) | 67.30 | 59.34–75.26 | <0.001** |
| Global Identification | −1.96 | −4.83–0.91 | 0.18 |
| National Identification | 5.32 | 2.62–8.01 | <0.001** |
| Political Ideology | 1.89 | −0.75–4.53 | 0.16 |
| Trust in Government | 4.89 | 2.04–7.74 | <0.001** |
| Trust in Healthcare | 1.51 | −1.18–4.20 | 0.27 |
| Trust in Science | 1.28 | −1.22–4.20 | 0.32 |
| Conspiracy | −1.53 | −4.27–1.22 | 0.28 |
| Age | −0.80 | −3.45–1.85 | 0.55 |
| Gender | 2.21 | −1.60–6.02 | 0.25 |
| Country: Philippines | −4.14 | −10.37–2.08 | 0.19 |
| Country: USA | 4.80 | −1.68–11.29 | 0.15 |
| Observations | 358 | | |
| $R^2/R^2$ adjusted | 0.155/0.128 | | |

*Note*: $R^2=0.13$; $F(11, 346)=5.776$, $p<0.05$. China is set as the reference group. ** indicates $p<0.05$.

this interaction effect was found to be non-significant ($\beta=-0.14$, SE=0.12, $\chi^2=1.26$, OR=0.87, $p=0.26$) (See Table 2).

We then performed a multiple regression analysis to predict perceived COVID-19 vaccine safety cross-culturally. In the context of the present model, we do not assume that the independent or dependent variables are normally distributed; instead, our assumption specifically applies to the errors, as highlighted by Williams et al. (2013). A significant regression equation was seen within this model (see Table 3). Only national identification ($\beta=5.32$, 95% CI [2.62, 8.01], SE=0.13, $p<0.001$) and trust in government ($\beta=4.89$, 95% CI [2.04, 7.74], SE=0.14, $p<0.001$) were found to significantly positively predict perceived vaccine safety. In contrast, global identification, political ideology, trust in healthcare, trust in science and COVID-19 conspiratorial beliefs were found to be non-significant predictors of perceived vaccine safety. Taken together, the finding regarding trust in government provides only tentative support for Hypothesis 2. Conversely, the result for national identification contradicts Hypothesis 2.

### 2.3.4 | Mediational analyses

Mediation analyses were conducted using the mediation package (Tingley et al., 2014) in R statistical software (R Core Team, 2022) to examine the mediating role of system justification on the relationship between an individual's level of national identification and COVID-19 conspiracy belief. This mediational model consisted of three paths: (a) the association between national identification and system justification, (b) the association between system justification and a COVID-19 conspiracy belief and (c′) the indirect effect of national identification on a COVID-19 conspiracy belief through the mediational effect of system justification while controlling for age and gender. Our models also include cluster-robust standard errors using the sandwich package (Zeileis et al., 2020) to enhance residual precision and account for the clustered nature of the present data (i.e. countries) within our estimates by allowing observations within a given country to correlate (Abadie et al., 2023; McNeish et al., 2017).

First, a multiple regression was run to examine the association between national identification and system justification (a path). The results indicated that national identification was positively associated with system justification ($\beta = 0.28$, SE = 0.14, $t = 2.01$, $p < 0.04$). Second, a multiple regression was run to examine the association between system justification and COVID-19 conspiracy beliefs (b path). The results indicated that system justification was positively associated with the COVID-19 conspiracy belief ($\beta = 0.36$, SE = 0.12, $t = 3.01$, $p = 0.002$). Third, the mediation package in R was used to test the indirect effect of national identification on the single-item COVID-19 conspiracy belief through system justification with 5000 simulated samples using quasi-Bayesian confidence intervals. The results indicated that national identification had a significant positive total effect on the COVID-19 conspiracy belief when not accounting for system justification (Total Effect = 0.14, 95% CI = [0.04, 0.29], $p = 0.006$), which was then reduced via the net effect of national identification on the COVID-19 conspiracy belief by subtracting system justifications mediator effect (ADE = 0.04, 95% CI = [0.02, 0.06], $p < 0.001$). Lastly, the average causal mediation effect was positive, indicating a significant indirect effect of national identification on the COVID-19 conspiracy belief through system justification (ACME = 0.10, 95% CI = [0.01, 0.25], $p < 0.04$) (See Figure 1).

## 2.4 | Discussion

This first study investigated how individual and cross-cultural differences influence support or oppose measures combatting the COVID-19 pandemic in three countries with contrasting responses to pandemic management and vaccine adherence. The challenges faced included rising vaccine hesitancy and the spread of COVID-19 conspiracy beliefs (Pummerer et al., 2022; WHO, 2019), rooted in misinformation and exacerbated by political polarization tied to social and political identities (Jutzi et al., 2020). The results provided partial support for Hypothesis 1 that a stronger connection to an individual's national identification was associated with being vaccine hesitant, while identifying with a global identity was linked to a greater willingness to accept and take the vaccine. However, inconsistent with Hypothesis 1, political ideology, belief in a COVID-19-related conspiracy belief, trust in government, healthcare and science were all non-significant predictors of vaccine adherence/hesitancy. Among all groups analysed, only participants from the Philippines demonstrated greater vaccine hesitancy compared to Chinese participants (reference category). This could be attributed to a confluence of factors, such as historical social traumas (e.g. Dengvaxia), pervasive misinformation and conspiracy theories, and a perceived ineffective and inequitable healthcare system, potentially increasing hesitancy (Amit et al., 2022; Berdida et al., 2023; Vergara, 2021). Among the three countries, the Philippines is the only one that did not develop its own vaccine and instead depended on other countries for procurement. Lastly, our exploratory interaction between global identification and political ideology in predicting vaccine adherence/hesitancy was non-significant.

Next, when testing Hypothesis 2, we only found supporting evidence that those who had greater trust in the government were more likely to perceive the COVID-19 vaccine to be safe. Interestingly, results also indicated that having a stronger national identification positively predicted perceived safety of the COVID-19 vaccine, which was in stark contrast to the finding that greater national identification also predicted greater COVID-19 vaccine hesitancy. These seemingly contradictory findings suggest that national identification may activate multiple, competing processes. While strong national identification may enhance perceptions of vaccine safety by framing vaccination as a prosocial act, it may simultaneously increase hesitancy if the vaccine is perceived as imposed or misaligned with national values (Williams et al., 2021). Thus, national identification can both bolster perceived safety and fuel reluctance, depending on the broader sociopolitical context (Osuji et al., 2022; Van Bavel et al., 2022). Furthermore, this finding coincides with other research that shows that the origins of the vaccine directly influence individuals who feel a deep sense of

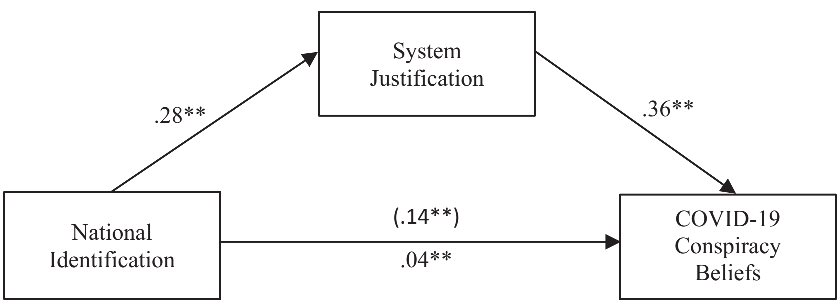


FIGURE 1 Mediation of national identification and COVID-19 conspiracy beliefs through system justification. All coefficients have been standardized.

national identification to perceive it as safer (Atkinson et al., 2023). Because our measure of vaccine safety explicitly asked about participants' perceptions of safety regarding a national vaccine, we believe this item may have inadvertently instilled a sense of added security surrounding the vaccine's origin. Collectively, these findings coincide with previous research performed within similar cultural contexts investigating the impact of distinct forms of social identity and governmental trust in influencing prosocial health behaviours and perceptions about the threat of COVID-19 (Blank & Shaw, 2015; Haslam et al., 2009; Jetten et al., 2020; Kossowska et al., 2021; Lazarus et al., 2023; Sparkman et al., 2022; Trent et al., 2022; Wu et al., 2021).

We proposed a mediational model using System Justification Theory to explain the influence of national identification on endorsing COVID-19 conspiracy beliefs. The relationship was mediated by perceiving the social system as fair and legitimate, leading an individual to justify the status quo, in turn providing a rationalization to support conspiracy beliefs during times of threat and uncertainty (see Jutzi et al., 2020; Mao et al., 2021). These findings highlight the intricate interplay of political ideology, social identity, trust and conspiratorial beliefs in shaping vaccine hesitancy across different countries. Understanding these factors is essential for devising effective strategies to promote vaccine acceptance and combat misinformation and disinformation.

Because data collection for Study 1 occurred during the latter stages of the pandemic in all three countries, we sought to rule out the possibility that the timing of the study influenced the observed effects. Given that public perceptions of COVID-19 evolved across different phases, we were particularly interested in whether the patterns identified in Study 1 were unique to the post-pandemic era or reflected broader trends that persisted throughout the pandemic. To address this, Study 2 was designed to conceptually replicate and extend Study 1's findings using a pre-existing six-country longitudinal dataset collected at the height of the pandemic (Wave 1 = July 2020 and Wave 2 = October/November 2020), when COVID-19 cases and deaths were peaking in each country (Mathieu et al., 2020). While this approach reverses the temporal order of studies, it allows us to test whether the same relationships were held earlier in the pandemic, strengthening our understanding of how these psychological processes unfold over time. Additionally, due to the pre-existing nature of Study 2's dataset, several constructs from Study 1 were assessed using refined, multi-item measures, enhancing measurement precision. For example, while vaccine adherence and hesitancy in Study 1 were captured with a dichotomous item, Study 2 employed a Likert-style scale, providing a more nuanced representation of these attitudes (see Study 2 methods for specific details).

# 3 | STUDY 2

To further examine how distinct social identity mindsets influence COVID-19 vaccine adherence, hesitancy and vaccine-related conspiratorial beliefs, Study 2 aims to conceptually replicate and extend the regression and mediation models from Study 1 (Hypotheses 1 and 3)[3] while enhancing the measurement accuracy of vaccine adherence/hesitancy, COVID-19 conspiratorial beliefs and global human identification by incorporating the multi-factor identification with all humanity scale (IWAH; McFarland et al., 2012).

IWAH is grounded in Turner et al.'s (1987) Social Categorization Theory, which posits that individuals hold multiple identities that vary in inclusivity. The most open-minded individuals expand their social in-group to encompass a global human identity (McFarland et al., 2019). Those with a strong global identity experience a deep sense of interconnectedness with humanity and emphasize interdependence (McFarland et al., 2012). Research shows that IWAH is positively associated with dispositional empathy, openness to experience, universalism, justice and prosocial attitudes, while being negatively linked to ethnocentrism, authoritarianism, social dominance orientation and self-centredness (Grimalda et al., 2018; McFarland et al., 2019). This mindset has also been tied to increased support for prosocial behaviours in response to the COVID-19 pandemic via global consciousness (Chen, Ng, et al., 2022; Liu & Macdonald, 2016). Therefore, we expect individuals with a strong global human identity, as measured by IWAH, to be more likely to adhere to COVID-19 vaccination compared to those who prioritize national identity.

## 3.1 | Hypotheses

Accordingly, we propose the following hypotheses as a conceptual replication and extension of Study 1.[4]

> **Hypothesis 1.** *Global identification and COVID-19 threat will positively predict vaccine adherence, while national identification will negatively predict vaccine adherence.*

> **Hypothesis 2.** *The relationship between national identification and COVID-19-related conspiracy beliefs will be mediated by one's level of system justification.*

## 3.2 | Methods

### 3.2.1 | Participants and Procedures

This second study aimed to conceptually replicate and extend the regression and mediational models from Study

1 (Hypotheses 1 and 3) while enhancing measurement accuracy of vaccine hesitancy, global human identification and COVID-19 conspiracy beliefs. To do so, we used data from a two-wave online survey with samples from China (Mainland), Hong Kong, Malaysia, Singapore, Taiwan and the United States.[5] These data are part of a larger project on the effects of global consciousness on prosocial behaviour that has been published elsewhere (Liu et al., 2023; Zhang et al., 2023), but none of this research has examined the effects of different identities or system justification on vaccine hesitancy. There was a 3-month interval between waves: Wave 1 data was collected from 2 July to 16 July 2020, while Wave 2 data was collected from October 5 to November 8, 2020, involving 6138 participants, albeit with missing data multiply imputed. Participants were recruited through Toluna, a global polling company. The selection of participants was stratified by age, gender and socio-economic status (see sample demographics in Table 4).

### 3.2.2 | Missing data analysis

Data across 67 variables contained missing values ranging from 0% to 73%. For the six countries analysed, 5053 of 6138 cases had at least one missing value, which is expected for longitudinal designs (Manly & Wells, 2015). We multiply imputed missing values for all incomplete variables (18.4% of total data) using the fully conditional specification and the Bayesian linear regression method in the mice 3.13 package (van Buuren & Groothuis-Oudshoorn, 2011). Analyses were then pooled across the 40 multiply imputed datasets and merged with non-imputed data for comprehensive results.

## 3.3 | Measures

### 3.3.1 | Vaccine hesitancy (Wave 2)

Vaccine hesitancy was measured using the single item 'If a COVID-19 vaccine was discovered, I would be willing to be vaccinated'. Responses ranged from 1 (Disagree strongly) to 7 (Agree strongly).

### 3.3.2 | COVID-19 conspiracy beliefs (Wave 2)

COVID-19-related conspiracy beliefs were assessed using the following five items: 'COVID-19 vaccine safety data is often fabricated', 'Immunizing children is harmful, and this fact is covered up', 'Pharmaceutical companies cover up the dangers of vaccines', 'People are deceived about vaccine efficacy' and 'The government is trying to cover up the link between vaccines and autism'. Responses ranged from 1 (Disagree strongly) to 7 (Agree strongly), which formed a reliable scale ($\alpha = 0.77$). The measurement invariance test suggested that a one-factor model, where all items load onto the same latent factor, had metric invariance across the six societies (see Appendix S1).[6]

### 3.3.3 | COVID-19 threat (Wave 1)

The threat of COVID-19 was assessed using the following two items: 'COVID-19 is a serious threat to public safety around the world' and 'I have taken preventative measures as protection against COVID-19 (e.g., mask-wearing, social distancing, regular hand washing)'. Responses ranged from 1 (Disagree strongly) to 7 (Agree strongly), which formed a reliable scale ($\alpha = 0.77$). Measurement invariance test suggested that a one-factor model had metric invariance across the six societies (see Appendix S1).

### 3.3.4 | System justification (Wave 1)

A brief version of the System Justification Scale (Kay & Jost, 2003) was used. This includes the four items: 'In general, I find society to be fair', 'In general, (my country's) political system operates as it should', 'Everyone in my country has a fair shot at wealth and happiness' and '(My country's) society is set up so that people usually get what they deserve', where each country name was inserted into the parentheses. Responses were given on a range of 1 (Disagree completely) to 7 (Agree completely), which once again formed a highly reliable scale ($\alpha = 0.86$).

**TABLE 4** Demographics based on CCK datafile ($N = 6138$).

| | Mainland China | Hong Kong | Malaysia | Singapore | Taiwan | USA |
|---|---|---|---|---|---|---|
| $N$ | 1015 | 1000 | 998 | 998 | 998 | 1123 |
| Gender | | | | | | |
| Female | 524 | 581 | 487 | 420 | 520 | 602 |
| Male | 491 | 419 | 511 | 578 | 478 | 521 |
| Age | 37.3 (10.3) | 40.8 (10.3) | 37.4 (10.2) | 41.6 (11.3) | 39.4 (10.2) | 54.0 (14.9) |

*Note*: SDs are contained within parentheses.

Metric invariance for system justification was established in previous research using the same data (Choi et al., 2025; see Appendix S1).

### 3.3.5 | Identification with all humanity (Wave 1)

Global human identification was measured using the original IWAH scale (McFarland et al., 2012), consisting of 9 three-part items, measuring the extent to which participants care for all humanity rather than just their national and local community in-groups. Items were rated on a scale from 1 (Strong disagree) to 6 (Strongly agree). A sample item is 'How close do you feel to each of the following groups? a. People in my community; b. People in my country/society; c. All humans everywhere'. IWAH was calculated by averaging the c items that make up the two subfactors of bond with (identification) and caring for (prosocial actions) all humanity ($\alpha = 0.90$). Metric invariance for IWAH was established in previous research using the same data (Liu et al., 2023; see Appendix S1).

### 3.3.6 | National identification (Wave 1)

Identification with one's national identity was measured using the IWAH scale. Responses ranged from 1 (Strongly disagree) to 6 (Strongly agree). A sample item is 'How often do you use the word we to refer to the following groups? a. People in my community; b. People in my country; c. All humans everywhere'. The 9 b items related to identification with one's national identity were then collapsed to create a single indicator of national identification, which was highly reliable ($\alpha = 0.90$). Metric invariance for national identification was established in previous research using the same data (Choi et al., 2025; see Appendix S1).

### 3.3.7 | Political ideology (Wave 1)

Participants' political ideology was assessed using the single item: 'Where would you place yourself on a scale from 0 (Strong right-leaning) to 10 (Strong left-leaning) on political issues'.

### 3.3.8 | Demographic variables (Wave 1)

Participants' age was indicated using the single item 'What is your age?', while participants' gender was identified using the single item 'What is your gender?' Responses were given on the following scale (0 = female, 1 = male).

## 3.4 | Results

### 3.4.1 | Multilevel regression analysis

We first opted to replicate and extend the findings of Hypothesis 1 from Study 1 surrounding national and global identification, political orientation, COVID-19 conspiratorial beliefs and perceived threat of COVID-19 using the lme4 package for multilevel modelling (Bates et al., 2015). However, we now introduce a more precise indicator of global human identification via IWAH (McFarland et al., 2012) and perceived COVID threat. In line with the recommendations of multilevel modellers, we will not ignore the hierarchical structure within the data by using OLS regressions even when ICCs for dependent/independent variables are low, as this would severely bias estimates (Gelman & Hill, 2006).

Table 5 presents the results of our multilevel model by maximum likelihood predicting vaccine hesitancy measured at Wave 2 using forward stepping to slowly build up our model (Gelman & Hill, 2006). We first ran an intercept-only model (Model 1), in which the constant is modelled as a random effect. This model allows us to estimate the intraclass correlation (ICC) of our dependent variable (Wave 2 vaccine hesitancy), which is a measure of variance due to the hierarchical structure of the data. According to this statistic, 2% of the variance in vaccine hesitancy at Wave 2 was due to cross-national differences, ICC = 0.02, $\beta = 2.77$, 95% CI = [2.18–3.36], $p < 0.001$. We then introduced each of our Wave 1 predictors and covariates (Model 2). Global human identification ($\beta = 0.83$, SE = 0.08, $t = 9.69$, $p < 0.001$) and perceiving COVID-19 as a threat ($\beta = 0.79$, SE = 0.07, $t = 11.93$, $p < 0.001$) significantly positively predicted being COVID-19 vaccine adherent at wave 2. Conversely, national identification ($\beta = -0.49$, SE = 0.08, $t = -5.97$, $p < 0.001$) and COVID-19 conspiratorial beliefs ($\beta = -0.78$, SE = 0.07, $t = -15.31$, $p < 0.001$) were significantly negatively associated with vaccine adherence (i.e. more hesitancy about the vaccine). Political ideology was found to be a significant positive predictor of vaccine adherence ($\beta = 0.34$, SE = 0.13, $t = 2.55$, $p = 0.011$), implying that being more politically left-leaning was associated with being on average more vaccine adherent (vs hesitant). When considered as a whole, these results replicated and extended our findings from Study 1 and supported Hypothesis 1 in Study 2. In Model 3, we probed an interaction term between global human identification and political ideology, which is depicted in Figure 2 ($\beta = 0.26$, SE = 0.13, $t = 2.02$, $p = 0.044$). When we assessed the simple slopes from this interaction, we found that this effect was more positive for those who were politically left-leaning ($\beta = 0.97$, SE = 0.11, $t = 8.64$, $p < 0.001$) when compared to those on the right ($\beta = 0.71$, SE = 0.10, $t = 6.92$, $p < 0.001$).

**TABLE 5** Multilevel random effects regression analysis for vaccine adherence/hesitancy (Wave 2).

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| **Predictors** | **Estimates** | **CI** | ***p*** | **Estimates** | **CI** | ***p*** | **Estimates** | **CI** | ***p*** |
| (Intercept) | 2.77*** | 2.18–3.36 | <0.001 | 2.62*** | 2.18–3.05 | <0.001 | 2.60*** | 2.16–3.04 | <0.001 |
| Global Human Identification (Wave 1) | | | | 0.83*** | 0.66–0.99 | <0.001 | 0.71*** | 0.51–0.91 | <0.001 |
| National Identification (Wave 1) | | | | −0.50*** | −0.66 – −0.33 | <0.001 | −0.50*** | −0.67 – −0.34 | <0.001 |
| COVID Threat (Wave 1) | | | | 0.79*** | 0.66–0.92 | <0.001 | 0.79*** | 0.66–0.92 | <0.001 |
| COVID Conspiracy (Wave 2) | | | | −0.78*** | 0.65–0.93 | <0.001 | −0.75*** | 0.63–0.91 | <0.001 |
| Political Ideology (wave 1) | | | | 0.34* | 0.08–0.60 | 0.011 | 0.33* | 0.07–0.59 | 0.013 |
| Age (Wave 1) | | | | 0.02 | −0.12 – 0.16 | 0.763 | 0.02 | −0.09 – 0.15 | 0.774 |
| Gender (Wave 1) | | | | −0.42*** | −0.55 – −0.29 | <0.001 | −0.42*** | −0.55 – −0.29 | <0.001 |
| Global Human Identification × Political Ideology | | | | | | | 0.26* | 0.01–0.52 | 0.044 |
| **Random Effects** | | | | | | | | | |
| $\sigma^2$ | 1.28 | | | 0.85 | | | 0.84 | | |
| $\tau_{00}$ | 0.01 $_{\text{Group}}$ | | | 0.02 $_{\text{Group}}$ | | | $0.02_{\text{Group}}$ | | |
| $\tau_{11}$ | | | | | | | $0.01_{\text{Group.GCProfileW1}}$ | | |
| $\rho_{01}$ | | | | | | | $0.92_{\text{Group}}$ | | |
| ICC | 0.02 | | | 0.02 | | | 0.02 | | |
| $N$ | 6 $_{\text{Group}}$ | | | 6 $_{\text{Group}}$ | | | $6_{\text{Group}}$ | | |
| Observations | 6138 | | | 6138 | | | 6138 | | |
| Marginal $R^2$/Conditional $R^2$ | 0.000/0.008 | | | 0.337/0.351 | | | 0.348/0.364 | | |

*Note*: Vaccine Adherence/hesitancy and COVID conspiratorial beliefs were only measured at Wave 2, Greater scores indicate greater vaccine adherence, Gender was coded as 0=female, 1=male. *$p<0.05$; ***$p<0.001$.

### 3.4.2 | Multilevel mediation analysis

A multilevel mediation model was conducted using the mediation package to replicate the finding from Study 1 (Hypothesis 3) of the mediating role of system justification (Wave 1) on the relationship between national identification (Wave 1) and endorsing COVID-19 conspiracy beliefs (Wave 2) relating to vaccines across six countries. Once again, this analysis consisted of three paths: (a) the relationship between national identification and system justification, (b) the relationship between system justification and conspiracy beliefs and (c′) the indirect effect of national identification on conspiracy beliefs through system justification.

First, a multilevel regression model was run to examine the association between national identification (Wave 1) and system justification (Wave 1), while controlling for age and gender (path a). The results indicated that national identification significantly positively predicted our mediator, system justification ($\beta=0.27$, SE$=0.01$, $t=21.78$, $p<0.001$). Second, a multilevel regression model with varying intercepts was run to examine the relationship between system justification (Wave 1) and conspiracy beliefs (Wave 2), once again controlling for age, gender and Wave 1 conspiracy beliefs (path b). The results indicated that our mediator system justification positively predicted Wave 2 COVID-19 conspiracy beliefs ($\beta=0.05$, SE$=0.01$, $t=4.59$, $p<0.001$). Lastly, the mediation package in R was used to test the indirect effect of national identification (Wave 1) on conspiracy beliefs (Wave 2) through system justification (Wave 1) with 5000 simulated samples (paths c and c′). The results indicated that Wave 1 national identification had a significant positive total effect on Wave 2 conspiracy beliefs when not accounting for Wave 1 system justification (Total Effect=0.02, 95% CI=[0.001–0.04], $p=0.031$), which was then significantly reduced via the net effect of national identification on conspiracy beliefs by subtracting system justifications mediator effect (ADE=0.01, 95% CI=[−0.01–0.03], $p=0.368$). Lastly, the average causal mediation effect was positive, indicating a significant indirect effect of national identification on conspiracy beliefs through system justification (ACME=0.01, 95% CI=[0.006–0.02], $p<0.001$), replicating our findings

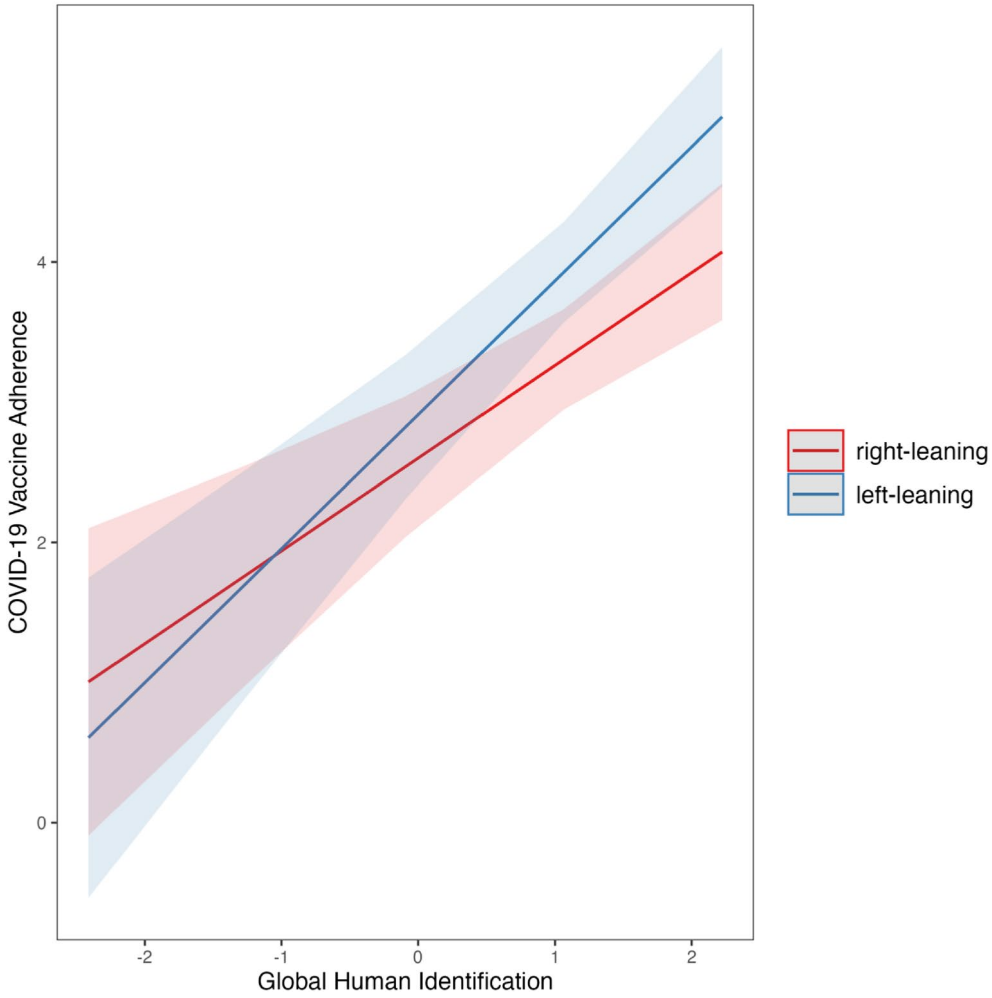


FIGURE 2 Interaction effect of political ideology on global human identification and vaccine adherence. Political Ideology was transformed to a dichotomous politically left- versus right-leaning variable.

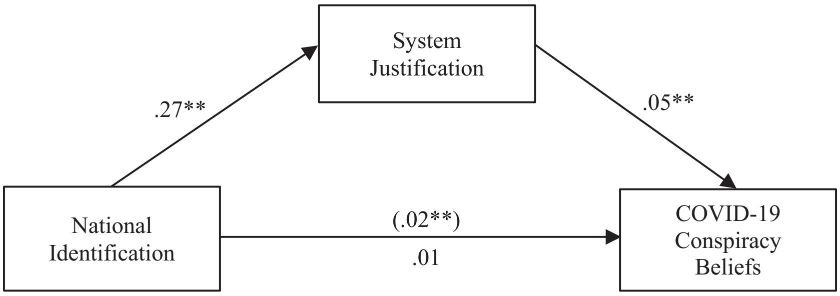


FIGURE 3 Mediation of national Identification (Wave 1) and COVID-19 conspiracy beliefs (Wave 2) through system justification (Wave 1). All coefficients have been standardized.

from Study 1 and providing support for Hypothesis 3 (See Figure 3).

## 3.5 | Discussion

The purpose of this second study was to provide a conceptual replication and extension of Study 1's findings via a larger, more diverse cross-cultural dataset to test our theoretical antecedents of vaccine hesitancy and conspiratorial beliefs during the height of the pandemic. Study 2 further corroborated the findings from Study 1 when using what we believe to be a more nuanced and precise indicator of global human identification through the usage of IWAH. Our results indicate that identifying with a global identity and perceiving COVID-19 as a threat positively promote prosocial behaviour in the form of greater vaccine adherence. Similarly, we found that being politically left-leaning significantly positively predicted being more vaccine adherent. We once again opted to explore the interaction between political ideology and global identification in predicting vaccine hesitancy/adherence. Interestingly, we found that individuals on both sides of the ideological spectrum were likely to be vaccine adherent but only if they also possessed greater levels of global identification. Importantly, this effect was found to be stronger (i.e. more positive) for left-leaning individuals when compared to right-leaning individuals. This result implies that global identification appears to buffer the ideological gap in prosocial behaviour in the form of greater vaccine adherence. Conversely, results indicated that identifying more strongly with a national identity and believing in COVID-19 conspiratorial beliefs was associated with greater levels of vaccine hesitancy.

We further found support for our mediation model, demonstrating that system justification mediates the relationship between national identification and COVID-19 conspiracy beliefs. Consistent with Hypothesis 2, national identification significantly and positively predicted COVID-19 conspiratorial beliefs across all countries before introducing system justification as a mediator. This finding aligns with prior research indicating that endorsement of nationalistic ideals and identity is positively associated with conspiracy beliefs (Jolley et al., 2018). Moreover, our results suggest that this relationship is explained by system-justifying beliefs, indicating that individuals who strongly identify with their nation may be more likely to endorse conspiratorial narratives about COVID-19 and its vaccine (among others) because system justification motivates them to preserve and rationalize existing sociopolitical structures as means to defend the system and its status quo from threat in the form of social change (Mao et al., 2021, 2024).

It should also be acknowledged that our analyses showed that only 2% of the variance in vaccine adherence/hesitancy measured at Wave 2 could be attributed to cross-national differences (ICC = 0.02). These findings suggest that the vast majority of variation in vaccine hesitancy stems from factors within countries rather than between them. The limited influence of national-level differences underscores the need for intervention strategies that prioritize localized efforts tailored to specific community contexts. Additionally, while global messaging and international cooperation remain crucial, they must be adapted to address the local determinants of vaccine hesitancy/adherence effectively. Within-country heterogeneity in vaccine attitudes is likely driven by factors such as political ideology, socio-economic disparities, institutional trust and social identity, all of which shape individual motivations and barriers to vaccine uptake (Van Bavel & Packer, 2021). Taken together, these results conceptually replicated and extended the findings found previously in Study 1 and support Study 2′s Hypotheses 1 and 2.

# 4 | GENERAL DISCUSSION

In this set of studies, we sought to examine the structural determinants of vaccine hesitancy and COVID-19 conspiratorial beliefs using both cross-sectional and longitudinal cross-cultural samples. We predicted an inverse relationship between multiple forms of identity and vaccine hesitancy by drawing on existing theories of the Social Identity Approach and System Justification Theory, and global human identification. In Study 1, a stronger connection to national identity was associated with increased vaccine hesitancy, whereas a global identity was linked to greater vaccine adherence. Similarly, Study 2 replicated these findings, which reinforce the idea that identifying with a global community promotes prosocial behaviour (e.g. vaccine adherence), while national identification is linked to greater vaccine hesitancy. In Study 1, we found that national identification and trust in government were the only significant positive predictors of perceived national COVID-19 vaccine safety. While the positive effect of national identification contradicted our second hypothesis, it aligns with prior research demonstrating a favourable bias towards domestically produced COVID-19 vaccines over internationally developed ones (Barceló et al., 2022). This finding suggests that national identity can help shape vaccine attitudes through in-group favouritism. Additionally, these results highlight how national identity can serve as a psychological heuristic, reinforcing perceptions of safety and efficacy in ways that may be independent of objective medical considerations.

In Study 2, we further explored the interaction between political ideology and global human identification on vaccine hesitancy, which revealed an intriguing pattern. It was observed that individuals with higher levels of global human identification were significantly more likely to adhere to COVID-19 vaccination regardless of their ideological leanings. This finding implies that fostering more inclusive superordinate identities may be a buffer against polarizing beliefs regarding prosocial and vaccine-related behaviours. In summary, the results of our study confirm our theoretical model by demonstrating that global human identification is a significant predictor of COVID-19 vaccine adherence, and that while this effect existed in both left- and right-leaning individuals, it was more positive for those on the left. These findings corroborate existing literature on global identification and prosocial behaviour, which highlights the complex interplay between identity and political ideological beliefs in shaping health behaviours (Barragan et al., 2021; Barragan & Meltzoff, 2023; Blank

& Shaw, 2015; Haslam et al., 2009; Jetten et al., 2020; Wang et al., 2023).

Both studies demonstrate the importance of social identity and political orientation in shaping vaccine hesitancy and adherence. They also highlight the role of system justification in mediating the relationship between national identification and COVID-19 conspiracy beliefs. To this end, the results confirm our mediational model linking a strong national identity to the endorsement of COVID-19 conspiracy beliefs to uphold the status quo and resist behaviour modifications during the pandemic. This suggests that perceiving the social system as fair and legitimate leads individuals to justify the status quo, providing a rationalization to support conspiracy beliefs during times of threat and uncertainty (Jutzi et al., 2020; Mao et al., 2021). This concurs with established research that has identified similar pathways that influence the endorsement of COVID-19 conspiracy beliefs through systemic trust and legitimacy (Adam-Troian et al., 2023; Jolley et al., 2018).[7]

Overall, the findings from both studies align with the broader literature in social and political psychology, which emphasizes the impact of social identity, political orientation and trust in shaping health behaviours (Kossowska et al., 2021; Lazarus et al., 2023; Sparkman et al., 2022; Trent et al., 2022; Valdes et al., 2024; Wu et al., 2021). The role of system justification in maintaining the status quo and supporting conspiracy beliefs during crises is also well documented (Douglas et al., 2019; Jutzi et al., 2020; Mao et al., 2021). These contribute to our understanding by providing empirical evidence across various cultural contexts and time frames, further highlighting the complex interplay of identity and political ideology (Study 2 only) in shaping responses to public health measures. However, while the present research provides promising insights into the cross-cultural antecedents of vaccine adherence/hesitancy and how an inclusive superordinate social identity may help buffer polarized beliefs and promote vaccine adherence, it is important to acknowledge a key limitation: The country samples across the two studies were relatively limited (Study 1: $N=3$, and Study 2: $N=6$). Furthermore, while a superordinate social identity (i.e. global identity) appears to mitigate ideological differences regarding vaccine hesitancy in a predominantly non-WEIRD sample, its applicability in more individualistic societies should be investigated further. Prior research has identified stark within-region differences in the determinants of vaccine adherence/hesitancy in WEIRD societies such as Europe and the United States (Steinert et al., 2022; Zheng et al., 2024), suggesting that the effectiveness of superordinate identities may vary across cultural contexts.

While the present research focuses specifically on COVID-19 vaccine adherence/hesitancy, our findings may have broader implications for understanding vaccine scepticism more generally. The influence of social identity, system justification, political ideology and trust on vaccine attitudes extends beyond the COVID-19 pandemic and is likely to shape hesitancy and acceptance in other vaccination contexts, including routine childhood immunization, influenza vaccines and emerging medical interventions (Van Bavel & Packer, 2021). Recognizing these underlying psychological and ideological drivers is crucial for developing effective public health strategies that address vaccine hesitancy across diverse populations and health crises. Previous research has shown that national identification, trust in government and ideological leaning influence vaccine attitudes beyond COVID-19 (Hornsey et al., 2018; Larson et al., 2018), suggesting that mechanisms observed in our studies may extend to other public health challenges. Moreover, the protective role of global identification in promoting vaccine adherence could apply to broader health behaviours requiring collective action and trust in scientific institutions. Therefore, future research should examine whether these identity-based dynamics similarly shape attitudes towards other vaccines and whether interventions aimed at fostering a more superordinate identity can be effective in mitigating ideologically motivated vaccine hesitancy in post-pandemic and non-pandemic contexts.

## 4.1 | Strengths, limitations, and future directions

We advanced the study of vaccine hesitancy and COVID-19-related conspiracy theories by exploring how different types of identities (global vs national) and systemic trust influence not only one's perception of COVID-19 vaccine safety but also a willingness to adhere to vaccination. We also used a system justification lens to put forth a mediational model that seeks to explain why individuals come to endorse conspiracy theories relating to the creation and outbreak of COVID-19 using cross-cultural data. By leveraging between-country differences in our design, we achieved high statistical power through online sampling. Lastly, the use of both cross-sectional and longitudinal replication allowed us to rigorously test our theoretical relationships, which have been largely overlooked in the extant literature on vaccine hesitancy, conspiracy theory, social identity and system justification.

Based on the current study's findings, future research should consider investigating how different nation-states, entirely dependent on foreign aid for vaccines, perceive the efficacy and legitimacy of that aid (e.g. vaccines) depending on the cultural origin. Furthermore, the integration of both experimental and longitudinal designs, aimed at elucidating the causal mechanisms underlying conspiracy beliefs and vaccine hesitancy, would yield substantial advantages to the existing body of literature. Lastly, future work should investigate the underlying mechanisms by which national and global human identification intersect regarding the relationship of COVID-related conspiracy beliefs through system justification.

There are a few limitations of this research worth noting. Firstly, we used a single-item measure to assess political ideology across multiple countries, which may limit the complexity of political ideology cross-culturally. However, previous cross-cultural research found evidence for the recurrence of a continuum from left to right across cultures (Jost, 2021). In Study 1, we used one item to assess participants' belief in a common COVID-19 conspiracy, which may have inadvertently simplified the endorsement of said belief cross-culturally. Data collection during Study 1 was conducted towards the end of the pandemic, which might have influenced beliefs about COVID-19 and its vaccine. To address this shortcoming, Study 2 used data from the first year of the pandemic when conditions were worsening. While Study 2 had a two-wave design, our dependent variables were not measured at Wave 1, preventing us from exploring cross-lagged or auto-regressive effects in COVID-19 vaccine adherence/hesitancy or conspiratorial beliefs. Therefore, Study 2 is not explicitly a longitudinal assessment of these effects, and therefore, caution should be placed when interpreting the results as anything other than correlational. Across the two studies, we used a single-item intention measure on vaccine adherence/hesitancy. This may have inadvertently oversimplified a complex construct, and therefore may or may not tap actual vaccination behaviour. Lastly, the present research was not preregistered, and the hypotheses were formed during the process of data analysis. However, our hypotheses were not designed to accommodate the results (Rubin, 2017) and indeed were contradicted by several aspects of our findings.

## 5 | CONCLUSIONS

In conclusion, our findings underscore the critical role of social identity and system-justifying beliefs in shaping vaccine adherence/hesitancy and COVID-19 conspiracy beliefs. The strong association between global human identification and increased vaccine adherence suggests that promoting a sense of global community could be a powerful strategy in public health communication. Conversely, the link between national identity and vaccine hesitancy highlights the need for targeted interventions that address nationalistic sentiments and their potential to foster resistance towards progressive social change regarding vaccines. The minimal variance in vaccine hesitancy in the current data (i.e. Study 2) attributable to cross-nation differences emphasizes the importance of localized, context-specific approaches to vaccine promotion.

Our findings offer novel insights into the interplay of ideological factors shaping public health behaviours. The results of our study highlight the need for targeted interventions and policy adjustments. These underscore the importance of fostering inclusive global identities to enhance acceptance of vital public health measures. As such, tailored strategies should aim at bridging ideological divides to promote widespread adherence to critical health initiatives (e.g. vaccination). In this regard, policymakers should focus on tailoring vaccine communication strategies to local cultural and political contexts, leveraging trusted community leaders and locally resonant messages. Overall, our study provides actionable insights for both theory and policy, advocating for nuanced, identity-conscious communication strategies to effectively combat vaccine hesitancy and enhance public health outcomes during global crises.

## AUTHOR CONTRIBUTIONS

**Evan A. Valdes:** Conceptualization; data curation; formal analysis; funding acquisition; methodology; software; writing – original draft; writing – review and editing. **Junix Jerald I. Delos Santos:** Conceptualization; data curation; funding acquisition; methodology; project administration; resources; writing – original draft; writing – review and editing. **James H. Liu:** Data curation; formal analysis; funding acquisition; investigation; project administration; supervision; validation; writing – original draft; writing – review and editing.

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## CONFLICT OF INTEREST STATEMENT

The author(s) declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

## DATA AVAILABILITY STATEMENT

The data, research materials, and code that support the findings of this study are available and can be located at the following link: https://osf.io/pa5yg/?view_only=5062ec8271f14faf917bc738fab1238f.

## ETHICS STATEMENT

The research and procedure were approved by the University of Baguio Research and Development Center (UB REC 2021-036) and were conducted in accordance with Massey University's Code of Ethical Conduct. All participants gave their informed consent prior to their participation in the study.

## RESEARCH MATERIALS AVAILABILITY STATEMENT

The data, research materials, and code that support the findings of this study are available from the corresponding author upon request or can be located at the following links: https://osf.io/pa5yg/?view_only=50520081bf5a4b31a479fc6cf14bb4b8.

## PRE-REGISTRATION STATEMENT

The present research was not preregistered.

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## Endnotes

[1] The complexity of booster-specific vaccine hesitancy should be acknowledged as its presentation and rationalization can often differ from those experiencing vaccine hesitancy at the time of the first dose (Yoshida et al., 2022).

[2] On the recommendation of an anonymous peer-reviewer, we standardized the predictors for Hypotheses 1 and 2 across our analyses.

[3] Hypothesis 2 was not included in this conceptual replication as the current data did not have an indicator of perceived vaccine safety.

[4] Hypothesis 2 from Study 1 could not be tested because the dataset for Study 2 did not include a measure of perceived COVID-19 vaccine safety. Therefore, we relabeled Hypothesis 3 from Study 1 as Hypothesis 2 in Study 2.

[5] Leung et al. (2023) analysed a theoretically related construct from the same dataset to explore the associations between cosmopolitan orientation and COVID-19 (vaccine) attitudes. Xie et al. (2022) further examined the relationship between social media usage and pandemic prevention attitudes and beliefs. The present research goes beyond their findings by exploring COVID-19 (vaccine) attitudes in relation to global and national identification, and test a novel mediational model intending to put forth a mechanism that explains the association between national identification and COVID-19 conspiratorial beliefs.

[6] This scale can be conceptualized as a proxy for COVID-19 conspiratorial beliefs as previous research from the Institute for Strategic Dialogue indicates that COVID-19 conspiracy theories tend to promote misleading and baseless claims not only about COVID-19 but also about general vaccines. Furthermore, recent research shows that the endorsement of one conspiracy appears to be positively associated with the endorsement of other conspiracies due to the monological network of beliefs (Williams et al., 2022, 2025).

[7] For the interested reader, see Appendix S1 where we performed an exploratory investigation of these mediational relationships from Studies 1 and 2 while accounting for global human identification to see if it may offer palliative effects regarding the indirect effect of national identification on conspiracy beliefs through system justification.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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