Group psychological roots of conspiracy beliefs in the UK, US, and Turkey

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ABSTRACT

Many studies have investigated the proximate mechanisms of belief in conspiracies, but few have addressed their evolutionary roots. Drawing from cultural evolutionary theory, we propose that conspiracy beliefs arise from our tendency to form cultural groups, tapping into our mistrust of outgroup members and the need for belonging to a distinct group. The defining feature of conspiracies- existence of a secret group of people working on harmful purpose- is deeply associated with outgroup mistrust. Challenging mainstream perspectives, conspiracies provide a venue for conformity for nonconformists and attract reactant people (non-conformists). We tested these hypotheses using a demographically representative cross-cultural survey of over 4500 participants from the UK, US, and Turkey and employed hierarchical linear models. We used two measures of conspiracy beliefs: conspiracy mentality and belief in health conspiracies. As predicted, outgroup mistrust and psychological reactance had the largest effect sizes for belief in health conspiracies, and reactance had the largest predictive power for conspiracy mentality. Control variables such as belief in science, political orientation, religiosity, and demographic factors had minimal effects. Turkish participants had the highest conspiracy mentality and health conspiracy scores, along with higher levels of outgroup mistrust and reactance, while UK participants had the lowest. Belief in health conspiracies and conspiracy mentality were strongly associated with vaccine hesitancy across all three countries, with the highest hesitancy in Turkey. Moderation analyses revealed that outgroup mistrust was a stronger predictor of health conspiracy beliefs in Turkey, while reactance was more significant in the UK and US. These results suggest that group psychology, particularly mistrust of outsiders and the need for belonging to a distinct cultural group, plays a crucial role in conspiracy beliefs and variations in their levels across cultures. Based on these insights, we propose strategies to address conspiracy beliefs and vaccine hesitancy.

INTRODUCTION

There is much variation in vaccination attitudes within and between countries. Conspiracy beliefs have been shown to be strongly associated with these attitudes in cross-cultural studies (Hornsey *et al.* 2018; Salali & Uysal 2020; see van Mulukom *et al.* 2022 for a review). Here we move a step further and ask why people believe in conspiracies in the first place and propose a cultural evolutionary hypothesis underlying belief in conspiracies. By examining the correlates of conspiracy beliefs in a cross-cultural setting, we also seek to better understand why countries vary in their levels of conspiracy beliefs and vaccination attitudes.

Evolutionary roots of conspiracy beliefs

Proximate explanations concern immediate mechanisms that may explain an observed behaviour (Tinbergen 1963). An example of a proximate explanation would be “people believe in conspiracies because their belief eases the difficult feelings associated with uncertainty”. Ultimate (or evolutionary) explanations are concerned with why questions: why do people believe in conspiracies in the first place? Ultimate explanations aim to understand the evolutionary function of a given behaviour. At the proximate level people believe in conspiracies to ease their lack of control over reality by perceiving patterns among seemingly unrelated events (Douglas et al., 2017; Kay et al., 2009; Sullivan et al., 2010) and in this way, to avoid uncertainty (Alper et al., 2020; van Prooijen and Jostmann, 2013). Studies to date

have investigated several proximate predictors of conspiracy beliefs, including education (van Prooijen 2017), sex (Bruder *et al.* 2013), (Frenken *et al.* 2022), political orientation (Imhoff *et al.* 2022) but hypotheses concerning the evolutionary roots of (i.e. ultimate explanations) of conspiracy beliefs are scarce. Some researchers have argued that conspiracy beliefs are specific mental adaptations evolved to detect dangerous coalitions in hostile past environments (van Prooijen & van Vugt 2018). Our argument is different. We believe conspiracy beliefs are not adaptive themselves, but the underlying psychological mechanism that is associated with conspiracy beliefs, that is *our tendency to form cultural groups,* is adaptive. There are two sides to the coin: on the one hand, conspiracy theories tap into our **mistrust of outsiders**, on the other they provide a venue for the **formation of distinct cultural groups**. In what follows we explain those two arguments further.

Outgroup mistrust

A central aspect of human cultural evolution is the formation of groups- a group of people who share beliefs, norms, and symbolic markers. Those shared beliefs and ethnic markers serve to identify cooperation partners and maintain cooperation beyond family (Richerson & Boyd 2005). Cultural group formation, however, is also linked to ingroup favouritism and outgroup mistrust (Efferson *et al.* 2008; Turner *et al.* 1987): people more willingly cooperate with ingroup members and often perceive outgroup members as untrustworthy. Because the key element in conspiracy beliefs is the existence of a secret group of people working on an unlawful or harmful purpose, those beliefs deeply concern ingroup/outgroup interactions. It is, therefore, possible that outgroup mistrust and conspiracy beliefs are highly associated, and this association can explain why conspiracy beliefs flourish in times of crisis. Societal crises, such as pandemics, stimulate belief in conspiracy theories (van Prooijen & Douglas 2017). Since the start of the COVID-19 pandemic, for example, a myriad of conspiracy theories has emerged (Freeman *et al.* 2020). This observed increase in conspiracies may be driven by outgroup mistrust which is heightened by threats like disease risk (Faulkner *et al.* 2004; Navarrete & Fessler 2006; Schaller *et al.* 2021). The widespread theories around the origin of COVID-19, such as the virus being intentionally spread by China or the US, tap very well into our evolved group psychology. We expect that individuals who are more mistrustful towards outgroup members will also have stronger belief in conspiracies.

Hypothesis 1 (H1): Conspiracy beliefs are highly associated with outgroup mistrust.

Conspiracy theories as a venue for conformity for nonconformists

Another aspect of group psychology is conformism. But not everyone in the population is a conformist. Some people strongly resist the temptations of societal influence- to gain recognition as someone who does not adhere to societal norms, exhibiting scepticism towards commonly accepted opinions and being resistant to consensus views. A relevant psychology measure here is reactance. Psychological reactance is characterized by a low tolerance for restrictions on personal freedoms and a scepticism towards consensus views (Brehm & Brehm 1981), often manifesting in the rejection of widely accepted beliefs, like the benefits of immunization, as a means to express and reinforce a nonconformist identity to oneself and others. Highly reactant people are less influenced by the conformist messages during vaccination campaigns (Salali *et al.* 2022). Conspiracy theories likely highly attract reactant people who refuse to conform to society's rules and mainstream explanations for major events. These theories provide a venue for *conformity for nonconformists*. If you have a

conspiracy theory too unpopular no one follows it (Imhoff & Lamberty 2017). Therefore, a successful conspiracy theory is one that is popular enough that a certain number of people believe in it (and feel bonded as it creates an *ingroup*) but unconventional enough that it satisfies the need for uniqueness. By providing alternative explanations, these theories signal nonconformity. This way, they can foster solidarity among the nonconformists and become an important source of shared identity- a distinct cultural group (Douglas *et al.* 2017; Sapountzis & Condor 2013). Arising from this discussion, we propose the following hypothesis:

Hypothesis 2 (H2): Psychological reactance is positively associated with belief in conspiracies.

Cross-cultural variation

The levels of belief in conspiracies vary greatly across countries (Hornsey & Pearson 2022). Previous findings indicate that people in the Middle East have a higher tendency to believe in conspiracy theories (Gray, 2010; Pipes, 1996; Zonis and Joseph, 1994). In Turkey, for instance, conspiracy theories are rife and often evoked as part of political rhetoric (Nefes 2017). Compared to the UK population, people in Turkey score higher on conspiracy mentality scales (Bruder *et al.* 2013), and on vaccine hesitancy (Salali & Uysal 2020). Health-specific conspiracy theories are prevalent in Turkey and belief in those are associated with lower acceptance of vaccines such as those developed against COVID-19 (Salali & Uysal 2020, 2021b). Despite the observed cross-cultural differences in the belief in conspiracies, theory-driven research on why we observe such differences is scarce (Imhoff 2022). By using a cross-cultural design with demographically representable samples from the UK, US and Turkey, we aim to address this gap and propose that the variation in the levels of conspiracy beliefs and mentality across countries will likely correspond to the variation in the group psychological traits: outgroup mistrust and reactance.

Hypothesis 3 (H3): In countries where people exhibit heightened levels of outgroup mistrust and reactance, they are also likely to score higher on conspiracy beliefs and vaccine hesitancy.

The cross-cultural setting also allows us to examine the robustness of the proposed associations among outgroup mistrust, reactance and belief in conspiracies across various cultural contexts.

Hypothesis 4 (H4): The positive associations among outgroup mistrust, reactance and conspiracy beliefs will be held across countries.

We control for several other psychological and demographic variables that have been found to strongly correlate with either conspiracy beliefs or vaccine hesitancy: general mistrust in others (Freeman *et al.* 2020; Goertzel 1994), trust and belief in science (Rutjens *et al.* 2021; Sturgis *et al.* 2021), political orientation (Imhoff *et al.* 2022), education, religiosity, age and sex (for reviews on demographic correlates see Douglas et al., 2017; Larson, Jarrett, Eckersberger, Smith, & Paterson, 2014). Currently, there is limited research on conspiracy theories from a cultural evolution perspective (Stubbersfield 2023). Utilising predictions from cultural evolution theory can offer unique insights into the cultural success of conspiracy beliefs (Stubbersfield 2023) and help tackle problems like vaccine hesitancy (Salali & Uysal

2021a). Our study is among the first to address this gap, using cultural evolution theory to explain why people believe in conspiracies and why these beliefs vary across cultures.

METHODS

Study sample

We conducted an anonymous online survey with a quota sample of participants in the UK (*n* = 1533), the US (*n* = 1550), and Turkey (*n* = 1567) from March 9th to April 8th, 2021. The quotas were based on population estimate data for age, gender, and education level for each country (and ethnicity for the UK and the US), and participants were recruited by Qualtrics. We excluded participants who i) did not reply "yes" to the initial check question on whether they have spent most of their childhood in the country in which they were participating or ii) did not pass the attention check questions during the survey. The demographic variables and their mean values for each country can be found in Supplementary Table 1. Informed consent was collected from all participants.

Psychological variables

Table 1 shows all the statements employed to capture the following variables, the response scales, Cronbach's alphas for each scale statement for each country. All survey questions were translated into Turkish by the authors and sent to native speakers for an additional check.

(Table 1 to be inserted here)

Given the diversity of conspiracy beliefs and our cross-cultural setting, we choose to measure belief in conspiracies using two separate measures. Our first measure concerns health-specific conspiracy statements based on conspiracies that emerged during the COVID-19 pandemic (Freeman *et al.* 2020). Our second measure is a *conspiracy mentality* score based on a scale developed to measure general susceptibility to conspiracy-based explanations such as groups of powerful people organizing secret plots (Bruder *et al.* 2013). Previous research has found that if a person believes in one conspiracy, he or she is more likely to believe in others (Goertzel 1994), and that conspiracy mentality predicts beliefs in specific conspiracies (Bruder *et al.* 2013). Although we predict people with high conspiracy mentality scores to have a higher tendency to believe in health-specific conspiracy theories, the psychological correlates, and consequences of having a conspiracy mentality and believing in specific health conspiracies may differ. Moreover, researchers have argued that to circumvent the problem of adapting specific conspiracy theories to a cross-cultural research design, where the same questions should be asked in all cultures, a scale measuring a more general mindset of conspiracy mentality could be more helpful (Imhoff 2022). By using both the conspiracy mentality scale and more specific health-related conspiracy theories as measures, we also contribute to the discussions around the issue of cross-cultural measurements of conspiracy beliefs.

While previous studies have demonstrated a strong correlation between conspiracy beliefs and vaccine hesitancy across these countries (Salali & Uysal 2020, 2021b), and this connection is well established in cross-cultural studies (Hornsey *et al.* 2018), we still measure

and present the levels of vaccine hesitancy across these three countries. We incorporate these findings into our correlation matrices to further illustrate the association of vaccine hesitancy with our key variables of interest—conspiracy beliefs, reactance, and outgroup mistrust.

Below, we provide details on the scales and measurement units employed for each variable:

Conspiracy mentality: We used a general conspiracy mentality scale (Bruder *et al.* 2013). We chose this scale as it is designed to measure the general tendency to believe in conspiracies, regardless of cultural factors associated with more specific conspiracy statements.
Health conspiracy beliefs: We chose among several health conspiracies, listed in (Freeman *et al.* 2020), that emerged during the COVID-19 pandemic based on their popularity (according to their appearance on the news, social media, and WhatsApp groups) across the three countries at the time of the study.
General vaccine hesitancy: Based on the vaccination attitudes examination- VAX scale (Martin & Petrie 2017).
Outgroup mistrust: We used a scale developed to measure trust in people from other countries and immigrants adapted from (Dhont & van Hiel 2011).
Psychological reactance: Although initially thought to be situation-specific (Brehm 1966; Miron & Brehm 2006), some researchers have conceptualized reactance as a measurable personality trait and developed a scale that we used here (Hong & Faedda 1996).
Belief in science: We measured belief in science using a selection of items from the Belief in Science Scale based on their factor loadings (Farias *et al.* 2013).
General mistrust: Measures whether someone trusts others, or thinks one should be careful in dealing with people (*World Values Survey: Round Seven – Country-Pooled Datafile* 2020).
Political orientation: A scale from left-wing (0) to right-wing (10).
Financial satisfaction: How satisfied one is with their financial situation (0 not satisfied at all, 10 completely satisfied).
Religiosity: How important religion is in someone's life (0, not at all important, 10 very important).

Statistical analyses

We first calculated the variation and mean values of our variables and examined the bivariate relationships across all variables and all countries. We used ANOVA followed by Tukey's honestly significant difference (HSD) tests to compare the mean levels of conspiracy mentality, health conspiracy beliefs, outgroup mistrust, reactance, belief in science, general mistrust and general vaccine hesitancy among the three countries.

We employed hierarchical linear modelling (HLM) to analyse the data, which is suited for the nested structure of our samples—individuals within countries. We specifically looked at the predictive power of outgroup mistrust and reactance on conspiracy mentality and health conspiracy beliefs (to test H1 and H2). The multilevel approach allowed us to account for the intraclass correlation, indicating how much variance in our dependent variables is explained by country-level differences. To this end, the Intraclass Correlation Coefficient (ICC) was calculated, providing insight into the proportion of total variance attributable to between-group differences. We controlled for a host of other variables, including demographic factors and psychological traits like general mistrust, belief in science and religiosity, to isolate the unique

contributions of our variables of interest. We used R's *lme4* package for the analyses (Bates *et al.* 2015).

Before performing the models, we checked for multicollinearity to ensure that the predictors were not excessively correlated, which could potentially distort the estimates and reduce the reliability of the model's inferred coefficients. All Variance Inflation Factor (VIF) values were below 2, indicating that the level of multicollinearity among the predictors is acceptable.

To explore the moderating effect of cultural context on these associations, we introduced interaction terms for outgroup mistrust and reactance with country (UK, US, and Turkey) into our models. These terms allowed us to test the hypothesis that the relationships between psychological factors and conspiracy beliefs hold across different countries (H3 and H4). In our initial moderation analysis, we employed HLM. However, this approach led to a singular fit issue, indicating potential problems with model specification due to the low variance at the country level, as suggested by the Intraclass Correlation Coefficient (ICC) values. Given the minimal variance explained by country and the statistical challenges with the HLM, we opted to simplify our moderation analysis by using a fixed effects model. This allowed us to assess country-specific effects without the complexities associated with random effects, thus providing robust estimates of the fixed interactions between country and our theoretically important predictors within the model.

RESULTS

Country-level summary statistics and bivariate correlations

We start by reporting the country-level differences in our psychological variables. Figure 1 displays the density plots illustrating the distribution of key psychological variables surveyed, including outgroup mistrust, reactance, conspiracy beliefs, and others, highlighting the variance within our cross-cultural dataset. Participants in the UK had a significantly lower mean vaccine hesitancy score than the participants in the US and Turkey (Figure 1A, M_{UK} = 2.74, M_{US} = 3.19, M_{Turkey} = 3.27, Tukey's HSD, $p < 0.001$ for UK-US, UK-Turkey and US-Turkey). There was no difference in the mean vaccine hesitancy scores between the US and Turkey (Tukey's HSD, $p = 0.10$). The mean agreement score for health conspiracies was highest in Turkey and lowest in the UK (Figure 1B, M_{UK} = 2.08, M_{US} = 2.54, M_{Turkey} = 3.02, Tukey's HSD, $p < 0.001$ for UK-US, UK-Turkey and US-Turkey). Participants in the US and Turkey scored higher on the conspiracy mentality scale compared to the participants in the UK (M_{UK} = 3.42, M_{US} = 3.72, M_{Turkey} = 3.73, Tukey's HSD: UK-US, $p < 0.001$, UK-Turkey, $p < 0.001$, US-Turkey, $p = 0.94$). Further examination of the distribution of scores revealed that the proportion of participants who scored high (4 and above) on the conspiracy mentality and health conspiracy beliefs were higher in the US and Turkey compared to the UK (Figure 1B and C, for health conspiracies: 5%, 10%, 22.5% and for conspiracy mentality: 27%, 43%, 48% for the UK, US and Turkey respectively).

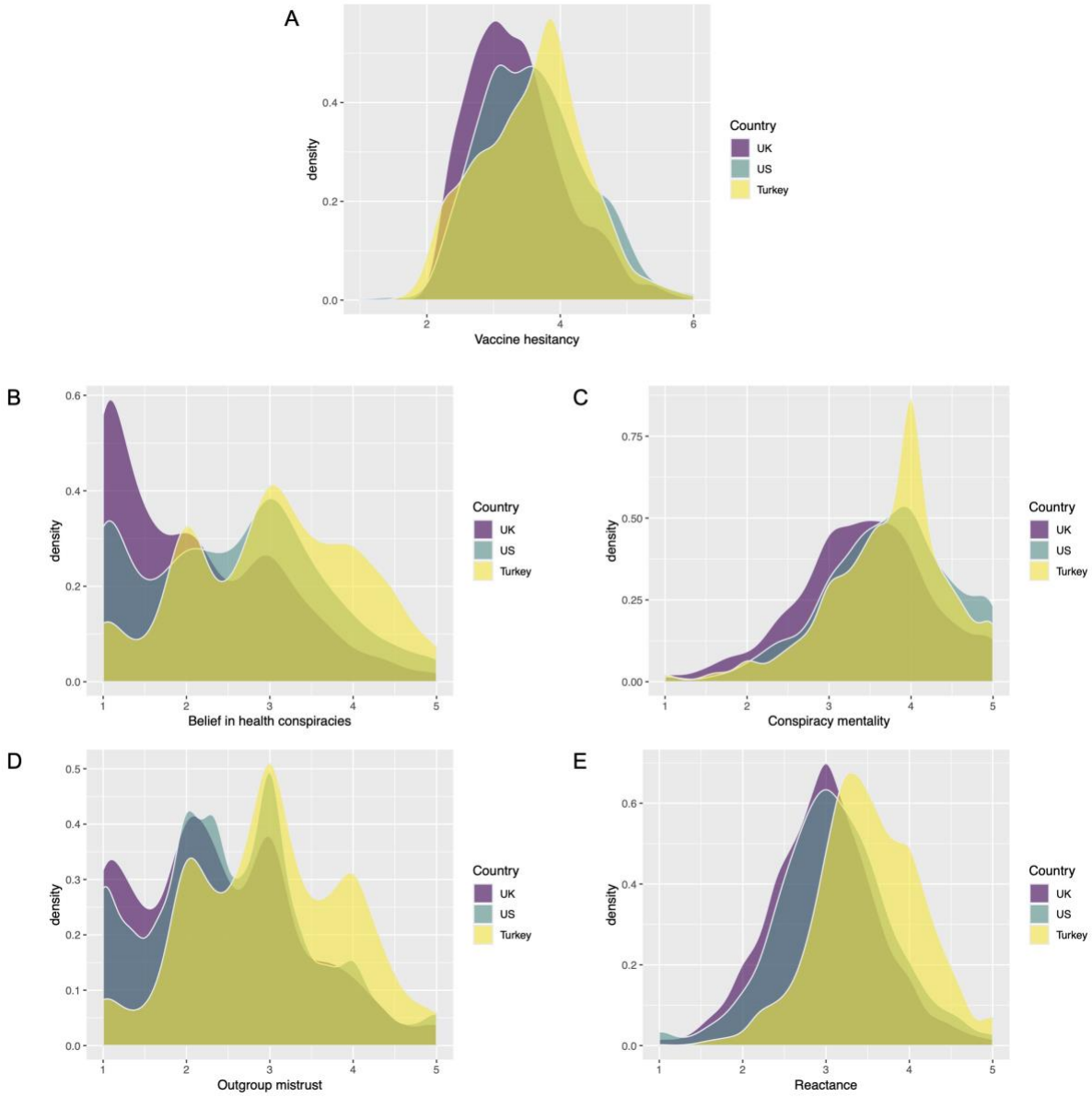

Figure 1. Distribution of A) vaccine hesitancy, B) belief in health conspiracy, C) conspiracy mentality, D) outgroup mistrust, E) reactance scores by country.

Among our predictors, we found the mean outgroup mistrust score to be highest in Turkey and lowest in the UK (Figure 1D, M_{UK} = 2.39, M_{US} = 2.52, M_{Turkey} = 3.01, Tukey's HSD, p < 0.001 for UK-US, UK-Turkey and US-Turkey). Likewise, the mean psychological reactance score was significantly higher in Turkey, followed by the US and the UK (Figure 1E, M_{UK} = 2.97, M_{US} = 3.08, M_{Turkey} = 3.52, Tukey's HSD: p < 0.001 for UK-US, UK-Turkey and US-Turkey). UK participants scored highest in belief in science, followed by the participants in Turkey and the US respectively (M_{UK} = 4.01, M_{US} = 3.48, M_{Turkey} = 3.80 =, Tukey's HSD: p < 0.001 for UK-US, UK-Turkey and US-Turkey). General mistrust was significantly higher among the Turkish participants (82% reporting that one needs to be careful in dealing with people) compared to US and UK participants (61% and 44% respectively, Tukey's HSD: p < 0.001 for UK-US, UK-Turkey and US-Turkey). Table 2 presents means and standard deviations of all variables across samples.

(Table 2 here)

We next examined bivariate correlations among variables after being pooled across the three samples. Vaccine hesitancy, conspiracy mentality, belief in health conspiracies, outgroup mistrust and psychological reactance were all positively correlated (see Table 3 for the pooled sample, for country-specific correlation matrices see Supplementary Tables 2-4). As predicted the strongest pattern was that participants who displayed more health conspiracy beliefs were more hesitant about vaccinations (Table 3, r = .63, p < .001). There was also a strong association between conspiracy mentality and vaccine hesitancy (Table 3). Participants who scored high on conspiracy mentality also scored high on belief in health conspiracies (Table 3). The strong relationships among vaccine hesitancy, belief in health conspiracies and conspiracy mentality held in all three samples (Supplementary Tables 2-4).

(Table 3 here)

Supporting our H1 believing in health conspiracies was strongly associated with outgroup mistrust (Table 3). This strong association was observed in all three samples ($r > 0.45$, p < .001 for all three countries). Outgroup mistrust was also positively associated with conspiracy mentality (Table 3), across all three samples (Supplementary Tables 2-4). In line with our H2, one of the strongest positive associates of health conspiracy beliefs and conspiracy mentality was psychological reactance (Table 3), a pattern observed in all three countries (Supplementary Tables 2-4). Our hypothesis (H3) posited that countries with heightened levels of outgroup mistrust and reactance would correspondingly show higher scores in conspiracy beliefs and vaccine hesitancy. This was corroborated by our findings. Specifically, participants from Turkey exhibited the highest levels of outgroup mistrust, reactance, belief in health conspiracies, conspiracy mentality, and vaccine hesitancy. Following closely were participants from the US, whereas those from the UK demonstrated the lowest scores across all these measures (Figure 1, Table 2).

Conspiracy belief predictors

To examine the unique predictive power of each of our variables we used hierarchical regression modelling. In what follows, we report our findings with respect to the two outcome variables: belief in health conspiracies and conspiracy mentality, and the predictive power of our theoretically key variables: outgroup mistrust and reactance.

Health conspiracies

Our hierarchical regression model (including country as a random effect) where belief in health conspiracies was the outcome variable revealed that the predictor with the largest effect size was outgroup mistrust, followed by reactance (Table 4A). The adjusted intraclass correlation (ICC) was 1.7%, indicating a very low level of variance at the country level compared to the individual level. People who had higher outgroup mistrust and reactance had a higher agreement with health conspiracies. Further supporting our H1 and H2, the predictive power of outgroup mistrust and reactance on belief in health conspiracies was stronger than that of other control and demographic variables. For example, although people with higher general mistrust agreed with health conspiracy beliefs more strongly, the effect size of this association was relatively small (Table 4A). People with higher levels of belief in science had lower levels of belief in health conspiracies, but the effect size of outgroup mistrust was three times that of belief in science (standardized betas: 0.35 vs -0.11). Although the more right-wing participants

and participants with higher religiosity endorsed health conspiracies more, the effect sizes were small (standardized betas < .09, Table 4A). Participants with higher education levels and those reporting higher financial satisfaction had lower agreement scores with health conspiracies, but again the effect sizes were much smaller compared to our theoretically important variables (Table 3). The effect sizes of age and sex were negligible (Table 4A).

Conspiracy mentality

Next, we examined the predictors of conspiracy mentality. The adjusted intraclass correlation coefficient (ICC) was 0.02, indicating that variance at the country level accounts for a very small proportion—just 2%—of the total variance in conspiracy mentality, compared to variance at the individual level. Supporting our H2, the strongest predictor of conspiracy mentality was psychological reactance (Table 4B). In line with H1 outgroup mistrust was a positive predictor of conspiracy mentality, but the effect size was smaller than that of reactance (standardized beta = 0.1, Table 4B). The other control variables that had relatively larger effect sizes (but smaller than that of reactance) were general mistrust in others (positive predictor) and level of education (negative predictor, Table 4B). Neither belief in science nor political orientation predicted conspiracy mentality (Table 4B). Conspiracy mentality increased with increasing religiosity, was higher in men compared to women, and decreased with increasing financial satisfaction but the effects were small (Table 4B). Age did not predict conspiracy mentality (Table 4B).

Influence of culture on the associations among outgroup mistrust, reactance, and conspiracy beliefs

To get a deeper understanding of the interaction between culture and the significant psychological predictors of belief in conspiracies, we performed moderation analyses. Supporting H4, the relationships we observed between key psychological variables (i.e., outgroup mistrust and reactance) and belief in health conspiracies and conspiracy mentality were consistent across countries. However, variations in the steepness of slopes were noted (Figure 2). To examine this variation further, we first report our fixed effects model findings for the interaction between outgroup mistrust and country (Table 5). The results revealed significant interactions between outgroup mistrust and country on beliefs in health conspiracies. Specifically, the interaction effects indicate that the association between outgroup mistrust and health conspiracies was weaker in the UK and the US compared to Turkey (Figure 2A and Table 5A). For conspiracy mentality, the interactions show slight but negligible increases in the UK and the US compared to Turkey (Figure 2B, Table 5B).

Similarly, the interaction between reactance and country was a significant predictor for belief in health conspiracies but not for conspiracy mentality (Table 5). We observed stronger effects in reactance interactions with the UK and the US compared to Turkey for predicting belief in health conspiracies (Figure 2C, Table 5A). This suggests that individuals with higher reactance levels are more likely to believe in health conspiracies, especially in these two countries. For conspiracy mentality, reactance x country interaction effect was insignificant, indicating that while reactance is a strong predictor of conspiracy mentality, the country-specific adjustments are less pronounced than those for health conspiracy beliefs (Figure 2D, Table 5B).

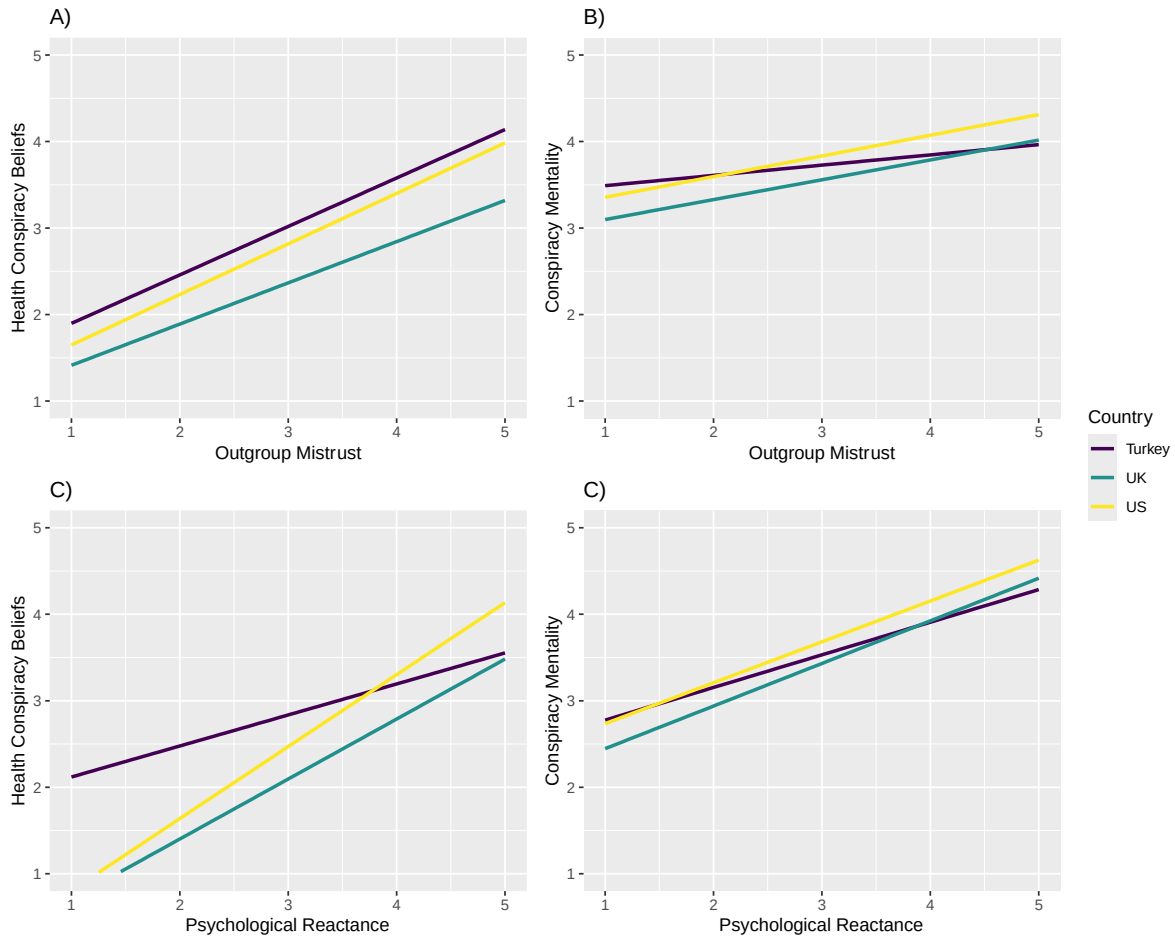

Figure 2. The moderating role of culture in explaining the link between outgroup mistrust and (A) belief in health conspiracies, (B) conspiracy mentality, and between reactance and (C) belief in health conspiracies, (D) conspiracy mentality.

Discussion

In this study, we proposed and tested the hypothesis that conspiracy theories tap into two key aspects of our evolved psychology of cultural group formation: mistrust in outgroup members and the formation of distinct cultural features by signalling non-conformity. By testing the predictive power of outgroup mistrust and psychological reactance on conspiracy beliefs in a cross-cultural setting, we also aimed to examine the consistency of those associations across countries. In line with our predictions, both outgroup mistrust and reactance were highly predictive of our two measures of conspiracy beliefs: belief in health conspiracy and conspiracy mentality across the three countries. We found people in Turkey to score highest in all measures of conspiracy beliefs, and correspondingly outgroup mistrust and reactance, while people in the UK scored lowest. Our further examination of the moderation of culture in explaining these associations found that while outgroup mistrust was a stronger predictor in explaining belief in health conspiracies in Turkey, reactance was a stronger predictor in explaining those in the UK and the US. Both health conspiracy beliefs and conspiracy mentality were strongly associated with vaccine hesitancy in all countries. Below, we discuss each of those findings and propose directions for tackling conspiracy beliefs and vaccine hesitancy in light of the findings.

As predicted outgroup mistrust followed by reactance had the largest effect sizes in explaining belief in health conspiracies. In contrast, the other control variables had small or negligible effects in predicting those. Because the key element in conspiracy beliefs is the existence of a secret group of people plotting harmful or unlawful events, most of those beliefs deeply concern ingroup/outgroup interactions. In line with our predictions, we found outgroup mistrust to be the strongest predictor of health conspiracies that emerged during the COVID-19 pandemic in the UK, US and Turkey. Empirical studies showed that heightened perceived vulnerability to disease contributes to negative attitudes towards outgroup members (Faulkner *et al.* 2004; Navarrete & Fessler 2006; Schaller & Neuberg 2012). Outgroup mistrust may be heightened in times of pandemics as part of an evolved disease avoidance mechanism, namely the *behavioural immune system* (Kurzban & Leary, 2001; Schaller et al., 2021; Schaller & Park, 2011; but see Ackerman, Hill, & Murray, 2018; Ackerman, Tybur, & Blackwell, 2021 for critical reviews).

We found that reactance had the largest effect size compared to all other predictors in explaining conspiracy mentality. To explain this association, let's focus on reactance and nonconformity. Why do some people so actively resist the influences of others and tend not to conform? It is possible that in modern environments the competition for social status is so fierce that people seek different venues to "stick out" from the crowd. Because conspiracy theories are unconventional, they satisfy people's need for being special and unique (Sternisko *et al.* 2020). Studies indeed have shown that people who are high in need for uniqueness tend to believe in conspiracies more (Imhoff & Lamberty 2017) and got influenced by the majority less (Imhoff & Erb 2009). An interesting line of future study would be to examine the correlation between reactance, the need for uniqueness and nonconformism. Our prediction is that those are highly correlated psychological constructs.

As predicted, Turkey scored highest on all measures, followed by the US and the UK. We further examined the effect of culture on understanding our proposed relations between outgroup mistrust and reactance on conspiracy measures. Our moderation findings suggested that culture had a stronger effect on the relations between outgroup mistrust and reactance on health-related beliefs compared to conspiracy mentality. Specifically, the association between outgroup mistrust and belief in health conspiracies was stronger for participants in Turkey compared to those in the US and UK. On the other hand, reactance was a stronger predictor of those beliefs in the UK and US compared to Turkey. Together, these findings suggest that while outgroup mistrust is more important in explaining belief in health conspiracies in Turkey, reactance is more important for those in the UK and US.

Why do people in some countries exhibit more outgroup mistrust than people in other countries? And why do we observe a stronger association of outgroup mistrust and health conspiracy beliefs in countries like Turkey? Turkey's history may be key here. Turkey's history, especially the collapse of the Ottoman Empire, was marked by geopolitical conflicts and the subsequent fragility of national sovereignty, which has seeded a persistent outgroup mistrust. This mistrust is often channelled into conspiracy theories that feature foreign actors as covert antagonists (Nefes 2017). In this sense the relatively high levels of belief in health conspiracies and vaccine hesitancy in Turkey could be accounted for by the heightened levels of outgroup mistrust in this country. In this context, we believe the strong association between outgroup mistrust and conspiracy beliefs likely underlies the observed heightened levels of conspiracy beliefs across Middle Eastern countries.

An alternative explanation that has been put forward recently is the degree of kinship intensity and exposure to the Western Church (Schulz *et al.* 2019). The authors have suggested that the exposure to the Western Church, via its impact on kinship structures, has resulted in a psychological profile marked by lower ingroup bias and outgroup mistrust (Schulz *et al.* 2019). If this is true, we can predict that the countries with shorter exposure to the Western Church, and hence higher outgroup mistrust, would also exhibit higher belief in conspiracies and vaccine hesitancy. Nevertheless, other ecological and historical factors besides the Western Church may explain the observed variation in outgroup mistrust across countries (Gelfand 2019; Gelfand *et al.* 2011). It is possible that kinship practices were already shifting for other reasons besides the church exposure and the church exposure coincided with those changes.

A recent review examining the country-level correlates of conspiracy beliefs concluded that those beliefs are higher among countries that are relatively high in corruption, high in collectivism, and low in GDP per capita (Hornsey & Pearson 2022). Nevertheless, the authors concluded that there are no studies yet examining the underlying mechanisms explaining these associations. Based on our findings, we suggest that all those country-level variables may very much relate to the individual levels of outgroup mistrust in a country. Take cultures of honour like Turkey where collectivism is prevalent, for example: people perceive themselves as tightly connected to their group, feeling that they are not that different from the other members of their group (Fulmer & Gelfand 2015; Leung & Cohen 2011; Triandis 2001). In this respect, we would expect collectivism to be highly related to ingroup/outgroup psychology. Studies showed collectivists perceive a greater difference between in-groups and out-groups compared to individualists. In individualist cultures, the primary distinction is between self and others, whereas in collectivist cultures, the main distinction is between in-groups and out-groups (Triandis 2001). Future studies could test the mediating role of outgroup mistrust in understanding the association between collectivism and conspiracy beliefs across nations.

Following our discussions on individualistic versus collectivist nations, the stronger association between reactance and belief in health conspiracies observed in the UK and the US, compared to Turkey, suggests that perceived threats to personal freedoms and willingness for non-conformity may be more important in explaining health conspiracies there. Why? Could it be that because those societies are more individualistic, there is to an extent a lesser feeling of group identity, and conspiracy beliefs fill this absence of identity by providing a venue for the formation of distinct cultural groups, signalling non-conformity? In this sense, they also feed into people's desire to feel unique. A future study design could further investigate the link between group-level individualism scores and reactance, and their link to belief in conspiracies.

Most of our control variables had either weak or negligible-sized effects on predicting conspiracy beliefs, except for the association of education with conspiracy mentality. An interesting and unexpected result among those was the negligible relationship between belief in science and conspiracy mentality in our HLM results. A closer look into the correlation matrices showed that while belief in science was negatively associated with conspiracy mentality in the UK and the US, the association was positive for the participants in Turkey. One reason may be that people's belief in science (how much they think science can help humans attain knowledge or understand the universe) may not always reflect their scientific

literacy or analytical thinking. If a person believes in the ability of science to attain truth but is inclined to intuitive thinking rather than analytical thinking, they will still be more susceptible to conspiracy beliefs (Alper *et al.* 2020; Swami *et al.* 2014). This theory might explain why people in Turkey show higher belief in science compared to those in the US, yet still display the lowest level of trust in vaccines (Salali & Uysal 2021b). Moreover, a recent study showed that trust in science makes people more vulnerable to pseudoscience and increases their chance of believing false claims that contain scientific references (O'Brien *et al.* 2021).

There were some differences in the effect sizes of predictors of conspiracy mentality and health-related conspiracy beliefs. For example, while reactance was a strong predictor for both, outgroup mistrust predicted health conspiracies more strongly than conspiracy mentality. The observed differences echo recent findings that different forms of conspiracy beliefs can have distinct behavioural correlates and outcomes (Hartman *et al.* 2021; Imhoff & Lamberty 2020). Previous findings also indicated belief in health-specific conspiracies to be a stronger predictor of vaccine hesitancy than having a general conspiracy mentality in the UK, US and Turkey (Salali & Uysal 2021b). Therefore, not all conspiracy beliefs may pose the same "risk" to public health. One reason may be that while the conspiracy mentality scale contains general statements such as "I think that politicians usually do not tell us the true motives for their decisions", health-specific conspiracies often involve more extreme statements like "vaccines will change our DNA" - beliefs that may have different psychological and demographic correlates. For example, in the Turkish sample we found that while religiosity and right-wing political orientation were positively correlated with belief in health conspiracies, the same variables were negatively correlated with conspiracy mentality (Supplementary Table 4). Future studies will benefit from further examining the behavioural and demographic correlates of belief in distinct conspiracy theories.

We also found culture to have less of a "moderating" effect on the theorized relationships between outgroup mistrust, reactance, and conspiracy beliefs for the conspiracy mentality scale compared to the belief in health conspiracies. In fact, this scale was invented and proposed to be used in cross-cultural studies, to overcome the influence of culture on specific conspiracy statements, as the scale contains more general statements — hence named conspiracy mentality (Bruder *et al.* 2013; Imhoff 2022). Our findings showing a similar magnitude of relations across our theoretically important variables and the conspiracy mentality across the three countries reinforce the statement that the conspiracy mentality scale is a good measurement tool for studies examining cross-cultural attitudes.

Both the findings here, and elsewhere showed a strong correlation between belief in health conspiracies and vaccine hesitancy (Hornsey *et al.* 2018; Salali & Uysal 2021b). As one of our key findings is the strong association between outgroup mistrust and belief in health conspiracies, here we discuss avenues for tackling conspiracy beliefs and vaccine hesitancy with a focus on outgroup mistrust. We propose some suggestions based on cultural evolution theory. Although ingroup bias in humans is strong, group memberships can be fluid. Fission-fusion dynamics and friendly interactions among unrelated people have been important characteristics of human societies throughout history, facilitating the emergence of complex knowledge systems (Derex & Mesoudi 2020; Dyble *et al.* 2015; Hamilton *et al.* 2007; Hill *et al.* 2011; Migliano *et al.* 2017; Powell *et al.* 2009; Salali *et al.* 2016). Certain incentives and mechanisms, such as trade opportunities, mutual information exchange, cooperation against a common threat, and speaking a common language may foster intergroup relations and

decrease mistrust in outgroup members. At the individual level, familiarity with outgroup members can help reduce stigma. For example, the establishment of contact with outgroup members and intergroup friendship networks helped to build intergroup trust in Northern Ireland (Tam *et al.* 2009). Taken together, strategies that increase tolerance toward and familiarity with people outside one's cultural group may help tackle health conspiracies and vaccine hesitancy.

What about the observed association with psychological reactance and conspiracy mentality? Our findings and the previous ones show that reactance is highly correlated with both conspiracy beliefs and vaccine hesitancy, and refusal to comply with health guidelines (Hornsey *et al.* 2020; Taylor & Asmundson 2021). Because reactant people refuse to conform to majority opinions, social influence attempts can easily backfire (Hornsey 2020). Indeed, in an experimental study researchers found that social influence did not predict the COVID-19 vaccination intention of the unvaccinated people (as of September 2021 when vaccines had been available) in Turkey (Salali *et al.* 2022). What predicted vaccine intention was their degree of psychological reactance and collectivism. Public messages tailored to people's underlying motivations can be helpful when tackling vaccine hesitancy among highly reactant people (Hornsey & Fielding 2017). A combination of different messages and nudges is expected to be more effective than a single strategy given the heterogeneity of attitudes in the population (Schimmelpfennig *et al.* 2021).

In sum, our findings suggest that consequences of our evolved group psychology can explain why people believe in conspiracies. Further examination of the associations among outgroup mistrust, conformity, reactance, and conspiracy beliefs in multi-national studies can help us better understand why there is much variation in conspiracy beliefs and in turn vaccination attitudes across countries and how we can address them.

Data accessibility. All data files and the R code are available at https://osf.io/yp4tb/?view_only=356edf2723a94cda9ae48ce36a38026e

Declaration of generative AI and AI-assisted technologies in the writing process
During the preparation of this work the authors used ChatGPT-4 in order to proofread some of the paragraphs. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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Authors' contributions. GDS and MSU conceived the project, designed the experiment, and did the statistical analyses. GDS wrote the paper and MSU commented on the drafts.

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Table 1. Psychological variables used in the study

Variable Name	Statement	Response Scale	Cronbach's Alpha Reliability Scores
Vaccine Hesitancy	**Please note the degree to which you agree with the following statements**	From 1 = completely disagree to 6 = completely agree	UK Sample: α_{total} = .93; α_{worry} = .83; α_{profit} = .86; $\alpha_{natural}$ = .88; $\alpha_{mistrust}$ = .92 US Sample α_{total} = .92; α_{worry} = .82; α_{profit} = .86; $\alpha_{natural}$ = .86; $\alpha_{mistrust}$ = .91 Turkey Sample α_{total} = .92; α_{worry} = .87; α_{profit} = .88; $\alpha_{natural}$ = .82; $\alpha_{mistrust}$ = .91 Overall: α_{total} = .92; α_{worry} = .84; α_{profit} = .87; $\alpha_{natural}$ = .86; $\alpha_{mistrust}$ = .91
Worry-1	Although most vaccines appear to be safe, there may be problems that we have not yet discovered.		
Worry-2	Vaccines can cause unforeseen problems in children.		
Worry-3	I worry about the unknown effects of vaccines in the future.		
Profit-1	Vaccines make a lot of money for pharmaceutical companies, but do not do much for regular people.		
Profit-2	Authorities promote vaccination for financial gain, not for people's health.		
Profit-3	Vaccination programs are a big con.		
Natural-1	Natural immunity lasts longer than vaccination.		
Natural-2	Natural exposure to viruses and germs gives the safest protection.		
Natural-3	Being exposed to diseases naturally is safer for the immune system than being exposed through vaccination.		
Misrust-1	Vaccines are safe. (*Reverse Coding*)		
Mistrust-2	I can rely on vaccines to stop serious infectious diseases. (*Reverse Coding*)		
Mistrust-3	I feel protected after getting vaccinated. (*Reverse Coding*)		
Conspiracy Mentality	**To which extent do you agree with the following statements?**	1 = Completely disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Completely agree	α_{UK} = .84; α_{US} = .82; α_{Turkey} = .82; $\alpha_{overall}$ = .84
1.	I think that many very important things happen in the world, which the public is never informed about.		
2.	I think that politicians usually do not tell us the true motives for their decisions.		

	3. I think that government agencies closely monitor all citizens. 4. I think that events which superficially seem to lack a connection are often the results of secret activities. 5. I think that there are secret organizations that greatly influence political decisions.		
Health Conspiracy Beliefs	**Below is a list of statements about the novel coronavirus. To which extent do you agree with each of the statements?** 1. The virus is created by a secret group in order to reduce the world population. 2. The spread of the virus is a deliberate attempt by a group of powerful people to make money and/or gain control. 3. Coronavirus is a bioweapon developed by China to destroy the West. 4. Big Pharma created coronavirus to profit from the vaccines. 5. Coronavirus vaccines contain microchips to control the people. 6. Coronavirus is manmade. 7. Coronavirus vaccines will change our DNA.	1 = Completely disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Completely agree	α_{UK} = .94; α_{US} = .93; α_{Turkey} = .93; $\alpha_{overall}$ = .94
Outgroup Mistrust	**To which extent do you agree with each of the statements?** 1. Generally, there are enough reasons to distrust people from another country. 2. When people from another country come near me, I do not trust them most of the time. 3. If there are people from immigrant origin around me, I usually do not trust them.	1 = Completely disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Completely agree	α_{UK} = .89; α_{US} = .87; α_{Turkey} = .82; $\alpha_{overall}$ = .87

General Mistrust	**Generally speaking, would you say that most people can be trusted? Or do you need to be very careful in dealing with people?**	0 = Most people can be trusted; 1 = Need to be very careful	-
Psychological Reactance	**To which extent do you agree with each of the statements?**	1 = Completely disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Completely agree	α_{UK} = .70; α_{US} = .69; α_{Turkey} = .61; $\alpha_{overall}$ = .70
	1. I become angry when my freedom of choice is restricted.		
	2. I find contradicting others stimulating.		
	3. It disappoints me to see others submitting to society's standards and rules.		
	4. I resist the attempts of others to influence me.		
	5. I consider advice from others to be an intrusion.		
Belief in Science	**To which extent do you agree with the following statements?**	1 = Completely disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Completely agree	α_{UK} = .89; α_{US} = .88; α_{Turkey} = .83; $\alpha_{overall}$ = .86
	1. Science provides us with a better understanding of the universe than does religion.		
	2. The scientific method is the only reliable path to knowledge.		
	3. Science is the most efficient means of attaining truth.		

Notes. Worry = Worries about unforeseen future effects; Profit = Concerns about commercial profiting; Natural = Preference for natural immunity; Mistrust = Mistrust of vaccine benefit (see Martin & Petrie, 2017)

Table 2. Means and standard deviations across samples

Variables	UK	US	Turkey
Vaccine Hesitancy	2.74 (1.05)	3.19 (1.15)	3.27 (1.11)
Conspiracy Mentality	3.42 (.81)	3.72 (.78)	3.73 (.73)
Health Conspiracy Beliefs	2.08 (.99)	2.54 (1.06)	3.02 (1.02)
Outgroup Mistrust	2.39 (.99)	2.52 (.97)	3.01 (.92)
General Mistrust	.44 (.50)	.61 (.49)	.82 (.38)
Psychological Reactance	2.97 (.65)	3.08 (.69)	3.52 (.62)
Belief in Science	4.01 (.86)	3.48 (1.02)	3.80 (.91)
Political Orientation	4.89 (2.09)	5.3 (2.82)	5.24 (2.88)
Financial Satisfaction	5.43 (2.57)	5.09 (2.95)	4.9 (2.84)
Religiosity	2.79 (3.29)	5.43 (3.7)	6.59 (3.11)
Total sample	1553	1550	1567

Note. Vaccine Hesitancy Scale ranges from 1-6; General Mistrust, Political Orientation (left to right), Financial Satisfaction and Religiosity range from 0-1; all other variables range from 1-5.

Table 3. Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10
1. Vaccine Hesitancy	-	.50***	.63***	.36***	.25***	.39***	-.25***	.11***	-.13***	.16***
2. Conspiracy Mentality		-	.51***	.27***	.23***	.40***	-.04**	.05***	-.14***	.12***
3. Health Conspiracy Beliefs			-	.54***	.29***	.48***	-.21***	.24***	-.08***	.33***
4. Outgroup Mistrust				-	.28***	.43***	-.07***	.26***	.03	.26***
5. General Mistrust					-	.21***	-.09***	-.04*	-.25***	.09***
6. Psychological Reactance						-	.02	.11***	-.05**	.19***
7. Belief in Science							-	-.22***	.09***	-.43***
8. Political Orientation								-	.23***	.34***
9. Financial Satisfaction									-	.13***
10. Religiosity										-

Note. Correlations are pooled across three independent samples. * = $p < .05$, ** = $p < .01$, *** = $p < .001$

Table 4. Hierarchical Linear Models

	A. Health Conspiracy Beliefs			B. Conspiracy Mentality		
Variable	**Standardized coefficient**	**CI low**	**CI high**	**Standardized coefficient**	**CI low**	**CI high**
Outgroup Mistrust	0.35	0.32	0.37	0.10	0.07	0.13
Reactance	0.25	0.23	0.28	0.34	0.31	0.37
General Mistrust	0.08	0.05	0.10	0.11	0.08	0.14
Belief in Science	-0.11	-0.14	-0.09	0.03	0.00	0.06
Age	-0.04	-0.06	-0.02	-0.01	-0.04	0.02
Sex (men)	-0.06	-0.11	-0.02	-0.08	-0.14	-0.03
Education (PG)	-0.01	-0.11	0.08	-0.25	-0.36	-0.13
Education (UG)	-0.12	-0.17	-0.06	-0.13	-0.19	-0.06
Political orientation	0.08	0.06	0.11	0.00	-0.03	0.03
Religiosity	0.07	0.05	0.10	0.05	0.01	0.08
Financial Satisfaction	-0.06	-0.09	-0.04	-0.09	-0.12	-0.07

Table 5. Fixed effects models for the moderator effect of country

	A. Health Conspiracy Beliefs			B. Conspiracy Mentality		
Variable	**Estimate**	**CI Low**	**CI High**	**Estimate**	**CI Low**	**CI High**
Outgroup Mistrust	0.53	0.49	0.58	0.05	0.01	0.09
Country UK	-1.16	-1.48	-0.84	-0.45	-0.72	-0.18
Country US	-1.14	-1.45	-0.82	-0.1	-0.37	0.16
Reactance	0.14	0.07	0.21	0.36	0.3	0.41
Outgroup Mistrust x Country UK	-0.18	-0.24	-0.11	0.07	0.02	0.13
Outgroup Mistrust x Country US	-0.14	-0.21	-0.07	0.05	-0.01	0.11
Reactance x Country UK	0.35	0.25	0.45	0.07	-0.02	0.15
Reactance x Country US	0.43	0.33	0.53	0.05	-0.03	0.13

Supplementary Tables

Table S1. Demographic variables by country

		Mean (SD)/n(%) UK	Mean (SD)/n(%) US	Mean (SD)/n(%) Turkey
Age (years)		45.13 (16.16)	44.69 (16.75)	40.73 (14.94)
	18-24	11.5%	14.0%	15.1%
	25-34	19.6%	19.0%	24.1%
	35-44	18.4%	18.3%	22.9%
	45-54	19.6%	16.7%	17.4%
	55-64	16.8%	17.2%	13.2%
	65+	14.2%	14.6%	7.3%
Gender				
	Female	792 (51.7%)	799 (51.5%)	777 (49.6%)
	Male	732 (47.7%)	736 (47.5%)	771 (49.2%)
	Non-Binary	8 (0.5%)	10 (0.6%)	18 (1.1%)
	Prefer not to say	1 (0.1%)	5 (0.3%)	1 (0.1%)
Education				
	Below Graduate	708 (46.1%)	1011 (65.2%)	1180 (75.3%)
	Graduate Degree	586 (38.2%)	341 (22.0%)	342 (21.8%)
	Postgraduate Degree	239 (15.6%)	198 (12.8%)	45 (2.9%)
Ethnicity				
	White British	1333 (87%)		

Black/ African / Caribbean	43 (3%)	
Asian	108 (7%)	
Other Ethnic Groups	49 (3%)	
Non-Hispanic White		932 (60%)
Hispanic / Latino		249 (16%)
Black / African American		208 (13%)
Asian		92 (6%)
Other		69 (4%)

Table S2. Correlation Matrix (United Kingdom)

Variables	1	2	3	4	5	6	7	8	9
1. Vaccine Hesitancy	-	.53***	.67***	.33***	.23***	.43***	-.32***	.17***	.22***
2. Conspiracy Mentality		-	.52***	.28***	.27***	.40***	-.11***	.04*	.14***
3. Health Conspiracy Beliefs			-	.48***	.26***	.46***	-.29***	.26***	.29***
4. Outgroup Mistrust				-	.28***	.37***	-.08***	.39***	.15***
5. General Mistrust					-	.15***	-.07**	.03	-.03
6. Psychological Reactance						-	-.12***	.19***	.17***
7. Belief in Science							-	-.08**	-.49***
8. Political Orientation								-	.20***
9. Religiosity									-

Note. Correlations are pooled across three independent samples. * = $p < .05$, ** = $p < .01$, *** = $p < .001$

Table S3. Correlation Matrix (United States)

Variables	1	2	3	4	5	6	7	8	9
1. Vaccine Hesitancy	-	.52***	.68***	.39***	.21***	.43***	-.37***	.25***	.21***
2. Conspiracy Mentality		-	.59***	.30***	.20***	.42***	-.17***	.21***	.16***
3. Health Conspiracy Beliefs			-	.53***	.19***	.68***	-.23***	.34***	.23***
4. Outgroup Mistrust				-	.18***	.47***	-.07**	.31***	.22***
5. General Mistrust					-	.10***	-.13***	-.04*	-.04*
6. Psychological Reactance						-	-.05*	.27***	.17***
7. Belief in Science							-	-.21***	-.38***
8. Political Orientation								-	.35***
9. Religiosity									-

Note. Correlations are pooled across three independent samples. * = $p < .05$, ** = $p < .01$, *** = $p < .001$

Table S4. Correlation Matrix (Turkey)

Variables	1	2	3	4	5	6	7	8	9
1. Vaccine Hesitancy	-	.48***	.39***	.28***	.16***	.21***	.00	-.11***	-.21***
2. Conspiracy Mentality		-	.36***	.15***	.07**	.32***	.29***	-.14***	.-19***
3. Health Conspiracy Beliefs			-	.51***	.15***	.22***	-.08**	.11***	.14***
4. Outgroup Mistrust				-	.16***	.27***	-.05**	.11***	.18***
5. General Mistrust					-	.09***	-.01	-.16***	-.10***
6. Psychological Reactance						-	.27***	-.13***	-.14***
7. Belief in Science							-	-.32***	-.43***
8. Political Orientation								-	.47***
9. Religiosity									-

Note. Correlations are pooled across three independent samples. * = $p < .05$, ** = $p < .01$, *** = $p < .001$