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Investigating the Links Between Cultural Values and Belief in Conspiracy Theories: the Key Roles of Collectivism and Masculinity

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Abstract

Research suggests that belief in conspiracy theories (CT) stems from basic psychological mechanisms and is linked to other belief systems (e.g. religious beliefs). While previous research has extensively examined individual and contextual variables associated with CT beliefs, it has not yet investigated the role of culture. In the current research, we tested, based on a situated cultural cognition perspective, the extent to which culture predicts CT beliefs. Using Hofstede's model of cultural values, three nation-level analyses of data from 25, 19 and 18 countries using different measures of CT beliefs (Study 1, $N = 5,323$; Study 2a, $N = 12,255$; Study 2b, $N = 30,994$) revealed positive associations between Masculinity, Collectivism and CT beliefs. A cross-sectional study among US citizens (Study 3, $N = 350$), using individual-level measures of Hofstede's values, replicated these findings. A meta-analysis of correlations across studies corroborated the presence of positive links between CT beliefs, Collectivism, $r = .31$, $95\%CI = [.15; .47]$ and Masculinity, $r = .39$, $95\%CI = [.18; .59]$. Our results suggest that in addition to individual-differences and contextual variables, cultural factors also play an important role in shaping CT beliefs.

Keywords: conspiracist beliefs, cultural values, situated cognition, collectivism, masculinity, cross-cultural

Conspiracy theories (CT) are beliefs that significant events are the result of malevolent actions from powerful groups who ‘pull the strings’ behind the scenes (Douglas, Sutton & Cichocka, 2017). Research indicates a high prevalence of CTs across both Western and non-Western countries (van Prooijen & van Vugt, 2018). Far from being innocuous, CTs can have negative consequences such as a reduced willingness to vaccinate children (Jolley & Douglas, 2014a), to take action to mitigate climate change (Jolley & Douglas, 2014b), to endorse unwarranted beliefs such as creationism (Wagner-Egger, Delouvé, Gauvrit & Dieguez, 2018), and may even increase discrimination toward stigmatized groups (Jolley, Meleady & Douglas, in press). Psychological research has extensively investigated individual differences, motivational and emotional states as well as contextual factors associated with belief in CTs (van Prooijen & Douglas, 2018). However, psychological science has hitherto ignored the role of culture, a void in the literature that we set out to fill.

Individual differences, Motivation and Conspiracy Theories

One approach to CTs focuses on individual difference predictors of CT (e.g., Swami, Coles, Stieger, Pietschnig, Furnham, Rehim, & Voracek, 2011), and identifies several traits that predict them. Converging evidence highlights links between CTs and a wide range of personality-social cognitive constructs. First, CTs correlate negatively with personality traits like ‘Agreeableness’ (Swami et al., 2011) and positively with schizotypy (Holm, 2009) and paranoid ideation (Fenigstein & Vanable, 1992; see Bruder, Hafke, Neave, Nouripanah & Imhoff, 2013). Second, CTs positively correlate with other belief systems including social dominance (Sidanius & Pratto, 2001), right-wing authoritarianism (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950; Bruder et al., 2013), and political cynicism (Swami et al., 2011). Other lines of investigation show that CTs adherence is lower among individuals with high analytical reasoning and high moral orientation towards epistemic rationality (Swami et al., 2014; Stahl & Van Prooijen, 2018).

However, one of the strongest predictors of adherence to one CT is the degree to which individuals adhere to other CTs (Goertzel, 1994; Sutton & Douglas, 2014; Wagner-Egger & Bangerter, 2007), even if those beliefs were artificially created for experimental purposes (Swami et al., 2011). This has led researchers to believe that CTs might be the reflection of a higher order, more general type of cognitive style; in other words, a ‘conspiracy mentality’ (Imhoff & Bruder, 2014).

With that view in mind, research has shifted towards motivational components that drive adherence to CTs. In that framework, CTs are conceptualized as beliefs which stem from psychological mechanisms pertaining to threat regulation and that individuals use in uncertain situations. According to the motivated cognition approach to CTs (Miller, Saunders, & Farhart, 2016; Saunders, 2017), CTs are motivated by a need to reduce uncertainty (Marchlewska, Cichocka, & Kossowska, 2018) and to restore a meaningful view over ambiguous situations for regaining control in the face of unexpected/threatening events (Whitson, Galinsky & Kay, 2015; see Douglas, Sutton, & Cichocka, 2017 for a review).

This threat-regulation theory of CTs is supported by converging evidence of positive links between CTs and death-related anxiety (Newheiser, Farias & Tausch, 2011), need for order (Abalakina-Paap, Stephan, Craig, & Gregory, 1999; Swami, 2012), and even preference for Manichean narratives, (i.e., simplified teleological accounts of complex random events; Oliver & Wood, 2014). In line with these findings, experimental investigations have shown that threats to control (van Prooijen & Acker, 2015; Whitson & Galinsky, 2008) and identity (Graeupner & Coman, 2017) increase CTs.

What about Culture ?

Research so far has thus identified three types of motivations that predict belief in CT: *epistemic* (i.e., understanding one’s environment), *existential* (i.e., feeling safe and in control) and *social* (i.e., belonging to a group). In sum, belief in CTs is linked with uncertainty

reduction needs, and increases under threats pertaining to control and social belonging (Douglas et al., 2017).

However, motivational processes do not occur in a social vacuum, especially since they are affected by individuals' cultural context (Oyserman, 2016). Accordingly, there is ample evidence for the existence of cross-cultural differences in motivations (Lin, Lin, & Han, 2008; Mammarella, & Fairfield, 2013; Kwon, Saluja, & Adaval, 2015). For instance, collectivistic values priming increases reliance on stereotypical information in word recognition tasks (Saluja, Adaval & Wyer, 2016) and individualistic values priming facilitates complex task solution (Oyserman, 2017). Therefore, it would be expected that culture plays an important role in shaping CTs. Yet, research so far has not tested this hypothesis.

To examine how culture may influence belief in CTs, we use culture-as-situated-cognition theory (CSCT; Oyserman, 2016), which posits that individuals' motivational states and cognitions (including beliefs) are activated depending on the surrounding cultural context. Namely, different cultural contexts activate some cultural values more than others, leading to cross-cultural differences in mindsets and motivations of entire populations (Oyserman, 2016). In accordance with CSCT, we hypothesize that cultural values may also be associated with CT beliefs, because of the different kinds of motivations these values activate. Cultural values should be differently linked with CTs depending on their content and their links with the above-mentioned classes of motives (which underlie CTs). To test this hypothesis, we used Hofstede's well established 6-values model of culture (Hofstede, 1984).

These 6 values are Power Distance (PD; the extent to which members of a society accept unequal power distributions), Individualism (ID; which reflects a preference for loose social structures in which individuals mostly take care of themselves and their relatives), Masculinity (MS; emphasizing achievement and competitiveness over cooperation, and consensus), Uncertainty Avoidance (UA; directly expresses how much members of a given

society are uneasy by uncertainty/ambiguity), Long Term Orientation (LTO; low LTO societies prefer to maintain traditions and view societal change with suspicion, whereas high LTO societies are more socially liberal) and Indulgence (IN; the degree to which societies allow free gratification of basic human drives linked with hedonism; see Hofstede, 2011).

This model was chosen for three main reasons. First, it is more parsimonious than Schwartz's (1990), which comprises an array of 10 values. This means less tests would be conducted, lowering the probability of false positives in this original investigation. Second, there is no firm consensus regarding isomorphism between individual-level and nation-level values in Hofstede's model (see Fischer, Vauclair, Fontaine, & Schwartz, 2010). Thus, we think that demonstrating a link between individual outcomes and a national level value model that is theoretically unrelated to individual level values would provide a stronger demonstration of the influence of macro-social factors over a psychological phenomenon (because it partially rules out value isomorphism as a potential confound). The last reason pertains to issues with theoretical relevance. While other models point at many interesting cultural values (e.g. Relational Mobility, Schug, Yuki & Maddux, 2010; Tightness-Looseness, Gelfand et al., 2011), we could not make straightforward predictions from them with regards to CTs prevalence. Overall, we found a superior methodological and theoretical relevance of Hofstede's model in the specific context of predicting adherence to CTs (with such values as Power Distance or Uncertainty Avoidance).

Hypotheses

As can be seen from the values identified in this model, some do have immediate implications for CTs (e.g. Uncertainty Avoidance). However, others might be more remotely related to CTs at first glance (e.g. Masculinity). Moreover, all of them fit within categories of the motivational classification established by Douglas et al. (2017). Power Distance, Individualism and Masculinity all pertain to ways to relate to others within societies (between

groups or individuals) and may thus tap into Social Motives. Uncertainty avoidance is linked with Epistemic Motives, while both Long-Term Orientation and Indulgence relate to Existential Motives (what worldview should prevail in a society, what meaning and goals should be assigned to life and rewarded). Based on the most up-to-date understanding of the motivational processes at play behind CTs, we therefore specified the hypotheses listed below.

Social Motives-Related Values

H1: Power distance. (PD, cultural tendency to accept hierarchy). Recent studies have shown that adherence to CTs is also underpinned by the need to make sense of one's societal structure and to rationalize it.

Several clues lead to think that PD could be a predictor of CTs beliefs. First, as it is the case for populism (Staerklé & Green, 2018), there is a vertical dimension in most CTs accusing the elites (politicians, governments, secret services, etc.; see Wagner-Egger & Bangerter, 2007), although some CTs accuse some minorities (Uenal, 2016) or outgroups (Grzesiak-Feldman & Irzycka, 2009). Further, the believers in CTs accusing the powerful elites are more often "losers" (speaking descriptively, not pejoratively), that is, defeated and excluded individuals in society, who are located on the lower levels of social status (Uscinski & Parent, 2014). Congruent with this analysis, studies often report a negative correlation between CTs beliefs and educational level (see for example van Prooijen, 2017), and with feelings of anomia (e.g., Goertzel, 1994; Green & Douglas, 2018; Wagner-Egger & Bangerter, 2007).

Moreover, CTs display positive correlations with Social Dominance Orientation (i.e. the tendency to endorse social hierarchies, Sidanius & Pratto, 2001; see Bruder et al., 2013; Green & Douglas, 2018) Because of this, and since belief in CTs are positively linked with

loss of control and powerlessness (Douglas, Sutton, & Cichocka, 2017), they should be positively correlated with PD.

H2: Individualism. (ID, cultural preference for loose social structures). The sum of empirical evidence available on CTs indicate that they might stem from an evolved mechanism for detecting malevolent coalitions (see van Prooijen & van Vugt, 2018). Because collectivistic values motivate individuals to focus on relational explanations for attributing causality to ambiguous events (see Oyserman, 2016), they should also tap into that mechanism more often, generating a higher ‘proneness’ to explanations of the CTs type. Recent experimental evidence partially corroborates this hypothesis by showing a positive effect of collectivism on ingroup vigilance (the tendency to attribute negative intentions to others; see Liu, Morris, Talhelm, & Liang, 2019). In addition, CTs are more prevalent among groups which are known to have more interdependent (i.e. collectivistic) selves (such as ethnic minorities; van Prooijen, Staman, & Krouwel, 2018, Markus & Kitayama, 1991). Furthermore, individualistic cultures promote more analytic thinking style (see Henrich, Heine, & Norenzayan, 2010), which reduces CT beliefs (Swami, Voracek, Stieger, Tran, & Furnham, 2014). Thus, ID should be negatively linked with belief in CTs.

H3: Masculinity. (MS, emphasis on competitiveness over cooperation). MS increases competition and intergroup conflicts, which are associated with belief in CTs (see Jolley, Meleady, & Douglas, 2019). Moreover, competitive contexts generated by MS are also known to trigger increased ingroup vigilance (the effect of collectivism on ingroup vigilance vanishes when cooperative contexts are made salient, Liu et al., 2019). MS should therefore be positively linked with CTs.

Epistemic motives-related values

H4: Uncertainty avoidance. (UA, cultural preference for certainty). This value is directly linked with the very epistemic motives at play behind adherence to CTs. Because

uncertainty management predicts CT beliefs (van Prooijen & Jostman, 2013), UA should be positively linked with CTs.

Existential motives-related values

H5: Long-term orientation (LTO, emphasis on social change vs. maintaining traditions). A lot of studies found that CTs are linked with political conservatism (Bruder et al., 2013; Grzesiak-Feldman & Irzycka, 2009; Hart & Graether, 2018; Imhoff & Bruder, 2014; Ståhl & Van Prooijen, 2018; Wagner-Egger & Bangerter, 2007). Hence, as high LTO entail more openness to social change, and less willingness to maintain traditions, it should be thus negatively correlated with political conservatism and CTs endorsement.

H6: Indulgence. (IN, valuing hedonism). CTs have repeatedly been observed as related to the feelings of anxiety (Green & Douglas, 2018; Hart & Graether, 2018; Newheiser, Farias, & Tausch, 2011; Wagner-Egger & Bangerter, 2007). Thus, they should be negatively linked with IN (increased hedonism), though there is no firm theoretical rationale for this hypothesis.

METHOD

Overview

To test our hypotheses and provide robust first evidence for a link between cultural values and CT beliefs, we conducted three studies. The first three studies were *cross-cultural* investigations of how cultural values measured at the *nation-level* are associated with prevalence of belief in CTs. Study 1 was a first exploratory test using conspiracy worldview (Lewandowsky, Gignac, & Oberauer, 2013), also measured at the *nation-level*. It was followed by two subsequent investigations using CTs about the 9/11 terrorist attacks (Study 2a; 19 countries) and with the tendency to believe conspiracy theories (Study 2b; 18 countries) measured at the *individual level* this time. The third study was a *within-culture* investigation of how cultural values measured at the *individual level* are associated with belief in specific CTs (e.g., 9/11, New World Order) and with general tendency to believe

conspiracy theories (Bruder et al., 2013). This strategy allowed us to rule out measurement level (i.e., ecological fallacy) and stimulus sampling as potential confounds driving the effects. All data underlying our findings are accessible on the Open Science Framework at <https://osf.io/vxqe9/>.

Ethical considerations

Studies 1 and 2a were strictly archival and did not require IRB approval from the authors' institutions. Study 2b was also archival, but the data was collected in parallel for other research purposes by some of the authors of the current manuscript. At study 2b's coordinator's institution (JGU Mainz, Department of Psychology, Ethics Committee), studies that did not involve deception, vulnerable populations, identifiable data, intensive data, or interventions were exempt from ethical approval and not evaluated at time of data collection. For study 2b's second coordinator, the study fell under a cluster approval of studies involving these kinds of variable. Likewise, most other involved institutions did not provide a review of ethics as this was a simple survey study. Where ethics were evaluated (University of Kent Ethics ID 201714894944604383, University of Bern Philosophisch-Humanwissenschaftliche Fakultät #2016-02-00005, Faculty of Psychology and Pedagogy of Eötvös Loránd University approval 188/2017) no issues were identified. Finally, study 3 obtained approval from IRB (#2019-0267) at the University of Illinois (Chicago) where it was conducted.

All studies were conducted in accordance with the 1964 Helsinki declaration (WMO, 1964), its later amendments, and the 2016 APA Ethical Principles of Psychologists and Code of Conduct (APA, 2017). As such, all participants provided their explicit consent to participate before data collection and had the right to terminate participation at any time. No participant data was suppressed from raw databases (unless specified, e.g. for countries with no Hofstede cultural values scores).

STUDY 1

Participants and Procedure

We re-analysed data from a cross-cultural study investigating the link between CTs and attitudes towards vaccines in 25 countries (see Hornsey, Harris, & Fielding, 2018). We crossed these data with Hofstede's country scores (from 0 to 100) of the 6-dimensional model of cultural values (based on data collected between 1967 and 2002; see Hofstede, 2011), and added national Human Development Index (HDI) scores as a control for country's wealth, health, and education levels. The dataset includes only participants residing in the target countries and who had completed all survey items ($N = 5,323$; over 200 per country; 50.07% men, $M_{\text{age}} = 42.71$, $SD = 15.89$; see supplementary materials table 1).

The data were collected in 2016 and among the measures available, we used Hornsey's and al. (2018) CTs scale as the outcome variable. Their measure was created using items from Lewandowsky, Gignac, and Oberauer (2013) that investigators considered to be prevalent worldwide (i.e. conspiracies about the assassination of President John Kennedy, the death of Princess Diana; the existence of a New World Order, and about the the 9/11 terrorist attacks; 5-point Likert from 1 'strongly disagree' to '5 'strongly agree'; $\alpha = .81$). All other specific methodological details can be accessed in the supplementary materials files from the original study at <http://dx.doi.org/10.1037/hea0000586.supp> and detailed description of the original procedure and results can be found in Hornsey, Harris, & Fielding (2018).

Analytic strategy

Though the study contained data from 5323 participants, we only had access to the country-level aggregated data (average scores from each national sample). Thus, we proceeded to OLS regression analyses with a $N = 25$ (number of countries). Though this sample size was suboptimal in terms of power to detect small and medium-sized effects (below $b = .4-.5$), this first exploration would still be informative as to whether some cultural factors strongly relate to CTs.

Results

The average CTs score in our 25 countries sample was 3.02 ($SD = 1.03$). All continuous measures and indices were standardized (z -scores). Then, an OLS regression model (percentile bootstrap for 95%CI of estimates, $N = 1000$) was computed with CTs score rate as the dependent variable. The model had an adequate fit, $F(7, 11) = 7.34$, $p < .001$ and predicted a substantial amount of variance in CTs, adjusted- $R^2 = .63$. It revealed a main negative effect of Individualism on CTs, $b = -.22$, 95%CI[-.37; -.07], $p = .006$ and a weaker positive trend for Masculinity $b = .07$, 95%CI[-.06; .18], $p = .084$ (see supplementary materials for the full model display). We then re-ran the model including National HDI as a covariate. The effect of Individualism was not substantially impacted $b = -.22$, 95%CI[-.41; -.01], $p = .008$, while that of Masculinity was weaker $b = .07$, 95%CI[-.10; -.17], $p = .11$ (see table 1). Therefore, the overall pattern of results lent empirical support for $H2$, weak evidence in favour of $H3$ and did not support all other hypotheses.

[INSERT TABLE 1 HERE]

Discussion

This first investigation yielded preliminary evidence suggesting that Hofstede's values may predict CT levels independently of 'heavy' economic-demographic variables measured by the HDI index (which had no significant association with CT rates). However, there were numerous limitations which impeded us from inferring much support for our hypotheses from these data. First, the sample size was too small ($N = 25$). This may have led us to detect inflated effects for individualism and masculinity (or even false positives), while prevented us to detect meaningful but small effects regarding other values. Moreover, the samples from which the data were obtained were limited in terms of population representativeness (with sample sizes around $N = 200$, see supplementary materials). In addition, it is not clear how Hornsey's and al. (2018) CT scale items were selected. This may have introduced stimulus

sampling biases Wells, & Windschitl, 1999) since we cannot be sure that participants in the studies knew in details the various conspiracies mentioned in the scale (beyond hearsay). Thus, further studies had to be conducted using data at least partly measured at the individual-level (to gain power) and relying on representative samples for each country population. This is why we proceeded with a second study.

STUDY 2

Study 2a

Participants and Procedure

We analysed the 2008 World Public Opinion poll (consisting of nationally-representative samples) about who perpetrated the 9/11 attacks (“International poll: No consensus on who was behind 9/11”, 2008). Again, we crossed these data with Hofstede’s international country indices (see Hofstede, 2011; same as in Study 1). The final dataset includes only participants a) who answered the question about the perpetrators of the 9/11 attacks, and b) who came from countries with cultural value scores (thus excluding one country: Palestine). This left us with a total sample size of 12,255 (51.2% men, $M_{age} = 39.82$, $SD = 15.52$) from 19 countries. The World Public Opinion poll was conducted during the summer of 2008 in different countries either by face-to-face or phone interviews. Our measure of CT belief was a single open-ended question related to the 9/11 attacks (*‘As you know, on September 11, 2001 the United States was attacked. Who do you think was behind the 9/11 attacks?’*). Answers involving al-Qaeda were coded as 0 (i.e., no conspiracy belief regarding the true identity of the 9/11 attacks’ perpetrators), while answers involving other groups that were not officially involved (e.g., U.S. Government, Israel) were coded as 1 (belief in a conspiracy theory regarding the true identity of the 9/11 perpetrators). We also included national Human Development Index (HDI) scores from 2007 (see UN, 2009) as a control for a country’s wealth, health, and education levels.

Analytic strategy

Because of the spatial component of our data, concerns may be raised regarding the mutual independence of cultural values (predictors) and spatial clustering (correlation according to geography; Fotheringham & Rogerson, 2008). However, our investigation focused on the links between nation-level characteristics and individual-level outcomes, which rendered complicated implementation of techniques to deal with clustering (e.g., with values measured at the individual level, the observed link between the two individual level variables may be moderated by higher order cluster effects and properly accounted for in a multilevel model; Fotheringham & Rogerson, 2008; Schielzeth & Nakagawa, 2013). Moreover, geography, in the form of measured cultural values (thus cultural ‘areas’), was precisely the target of our investigation and thus could not be modelled as a random effect or controlled for, especially since each country had unique cultural value scores. This excluded conducting spatial regression or mixed-model analyses as a viable option.

On the other hand, clustering needed to be accounted for in the computation of standard errors to avoid grossly inflated Type I errors. One solution consists in simply conducting correlation analyses on aggregated country data, but this would result in unacceptable power losses (down to $N = \text{number of countries} = 18/19$). We therefore conducted regression analyses of cultural values upon individual responses using cluster-robust standard errors (see Bryan & Jenkins, 2015).

Also, we expected that many predictors in the models would be significant at the $p < .05$ threshold due to sample size alone. To lower the likelihood of interpreting false positives, we decided to set up a smallest effect size of interest (Fritz, Morris, & Richler, 2012). We followed Cohen’s (1988) guidelines specifying a minimum effect size of interest of $d = .2$ (or $r = .10$). Yet, more recent perspectives on the meaningfulness of effect size point at the real-world relevance for effects of $d = .10$ (or $r = .05$) magnitude (see Funder & Ozer, 2019),

especially when studying variables (like culture) which affect outcomes over time through repeated exposure. Still we argue that in the context of the present exploratory investigations using non-experimental methods (including archival data), effect sizes might be inflated despite our large samples. In that context, a minimum effect size of $d = .20$ constitutes a reasonable conservative option for interpreting the observed effects, that would include effects which ‘real’ size could be twice as small (i.e. $d = .10$).

Results

The overall mean CT belief rate in our 19 countries sample was 32.3%. All continuous measures and indices were standardized (z -scores). Next, a cluster-robust binary logistic regression model was computed with CT belief rate as the dependent variable. The model had an adequate fit, Wald’s $F(7, 11) = 3.70, p = .026$, 70% classification accuracy, and predicted a substantial amount of variance in CT belief, Nagelkerke’s pseudo- $R^2 = .11$. National HDI was adjusted (the unadjusted results were similar, but we wanted to provide the least inflated estimates of our parameters) and unadjusted results can be found in the Supplementary Materials.

As expected, due to ambient noise alone, 5 out the 7 model variables (71%) were significant below $p = .05$. Results are displayed in the upper half of Table 1. The overall pattern of relationships supports all hypotheses except for the relationships between power distance and CT belief. Therefore, $H1$ was not supported. As predicted, we observed negative relationships between both individualism, long-term orientation, and indulgence with CT beliefs, which is consistent with $H2$, $H5$, and $H6$ respectively. Similarly, we observed a positive relationship between masculinity and CT belief, which was consistent with $H3$ and a positive relationship between uncertainty avoidance and CT in line with $H4$.

[INSERT TABLE 2 HERE]

Discussion

These further results provided support for hypotheses 2 to 6, once again despite economic-demographic variables measured by the HDI index. Here however, the measure of CT beliefs was limited, given that it consisted in only one item pertaining to CT beliefs about the 9/11 attacks (i.e., stimulus sampling issues, Wells & Windschitl, 1999). Therefore, we conducted another study in 18 countries, with a validated measure to assess participants' conspiracist mindset (Conspiracist Mentality Questionnaire; Bruder et al., 2013).

Study 2b

Participants and Procedure

In this third study, we used data from 18 countries (which had cultural value scores) where the Conspiracy Mentality Questionnaire (CMQ) had been administered. The data was collected by the PiCOM consortium in 23 countries (N = 33,431), pooling resources from a large group of academic researchers working on conspiracy theories. Specifically, consortium members were invited to run or include the CMQ in ongoing survey studies, aiming at representative samples in their respective countries, with a minimum of 300 respondents. The CMQ (Bruder et al., 2013) taps into a general tendency to believe in CTs and consists of five items for which participants have to assess the likelihood 11-point Likert scale (e.g. '*events which superficially seem to lack a connection are often the result of secret activities*'; from 1 '*0% completely unlikely*' to 11 '*100% completely likely*'). For the present study, total sample size was of 30,994 (44.68% men, $M_{age} = 41.14$, $SD = 7.68$) from 18 countries. In nine countries (50%) participation included monetary incentives. As in Study 2a, we then merged these with Hofstede's international country indices.

Analytic Strategy

Given that the data from study 2b was structured as that from study 2a, we had to implement the same analytic strategy and use cluster-robust regression analyses to test our hypotheses.

Results

The overall mean CMQ in our 18 countries sample was 6.44 ($SD = 2.22$), and reliability was adequate. All continuous measures and indices were standardized (z -scores). Next, a cluster-robust OLS regression model was computed with CMQ scores as the dependent variable. The model had adequate fit, Wald's $F(7, 12) = 25.04$, $p < .001$, and predicted a substantial amount of variance in conspiracist mentality, $R^2 = .14$. As in Study 2a, it was adjusted for national HDI (the unadjusted results were similar, but we wanted to provide the least inflated estimates of our parameters). Unadjusted results can be found in Supplementary Materials. This time however, only 2 out the 7 model variables (28.5%) were significant below $p = .05$. Results can be seen in the lower half of Table 1. Unlike in Study 2a, this time only individualism and masculinity's links with conspiracist mentality were significant, providing further evidence for $H2$ and $H3$ only. We replicated the non-significant relationship between power distance and CTs from Study 2a. This time, however, we found no support linking conspiracist mentality with either uncertainty avoidance, indulgence, or long-term orientation.

Discussion

This third investigation allowed us to gain confidence in the existence of robust links between individualism and belief in CTs as well as between masculinity and CTs. But all studies so far were conducted using measures of Hofstede values at the nation-level, which can still be biased. To avoid committing so-called ecological fallacies, we decided to conduct a fourth study to assess the links between self-reported endorsement of Hofstede's values and several measures of belief in CTs.

STUDY 3

In this fourth study, we used a convenience sample and conducted a survey among 350 participants in the United States (> 250 to obtain stable correlation estimates; Schönbrodt &

Perugini, 2013) on Amazon Mechanical Turk, for a \$1.00 reimbursement. Participants took on average eight minutes to complete the survey. Our final sample consisted of 350 U.S. citizens ($M_{\text{age}} = 33.58$, $SD = 9.34$; 66.7% women). Measures were presented in the following order (details of all scales can be found in Supplementary Materials):

Conspiracy Mentality. Participants completed the CMQ (Bruder et al., 2013; $M = 7.50$, $SD = 1.98$, $\alpha = .88$).

Generic Conspiracist Beliefs scale. Next, participants were asked to answer the Generic Conspiracist Beliefs Scale (GCBS; Brotherton, French, & Pickering, 2013). Like the CMQ which taps into a general ‘mindset’, the GCBS consists of a series of 15 statements about various ‘typologies’ of CTs (e.g., ‘*Secret organizations communicate with extra-terrestrials, but keep this fact from the public*’; 5-point Likert from 1 ‘*not true at all*’ to 5 ‘*very true*’; $M = 3.08$, $SD = 1.01$, $\alpha = .96$).

Specific Conspiracy Beliefs scale (SCBS). Participants were then introduced to a series of 8 items we designed to tap into real-world conspiracy theories (e.g., ‘*How likely is it that billionaire George Soros is behind a hidden plot to destabilize the American government, take control of the media, and put the world under his control?*’) including one about the 9/11 terrorist attacks (7-point Likert, from 1 ‘*extremely unlikely*’ to 7 ‘*extremely likely*’, $M = 3.83$, $SD = 1.57$, $\alpha = .91$). Three of the items, including the item about the 9/11 attacks, were adapted from the ANES (2012), while the rest were adapted from Oliver and Wood (2014).

Hofstede Cultural Values. The next series of measures were the Hofstede cultural value scale (Yoo, Donthu, & Lenartowicz, 2011). It comprises five dimensions pertaining to all cultural values from Hofstede’s model except for Indulgence, including a total of 26 items from 1 ‘*completely disagree*’ to 7 ‘*completely agree*’. Power Distance (e.g. ‘*People in higher positions should avoid social interaction with people in lower positions*’) comprised 5 items ($M = 2.29$, $SD = 1.18$, $\alpha = .93$), Uncertainty Avoidance (e.g. ‘*Rules and regulations are*

important because they inform me of what is expected of me') 5 items ($M = 4.02$, $SD = .69$, $\alpha = .82$), Masculinity (e.g. *'It is more important for men to have a professional career than it is for women.'*) 4 items ($M = 2.77$, $SD = 1.22$, $\alpha = .89$) and Long-Term Orientation (e.g. *'Working hard for success in the future'*) 6 items ($M = 4.14$, $SD = .60$, $\alpha = .79$). This scale had a final dimension assessing Collectivism, which we thus reversed to obtain a measure of Individualism (e.g. *'Individuals should sacrifice self-interest for the group'*; 5 items; $M = 4.76$, $SD = .94$, $\alpha = .90$). However, Indulgence was not part of this scale, rendering it impossible to test our hypotheses regarding that sixth cultural value.

Ideological Orientation. At the end of the survey, along with the demographics, two items were included to measure participants' political ideology (7-point Likert, from 1 *'very liberal'* to 7 *'very conservative'*, $M = 3.69$, $SD = 1.86$), which we also used to compute a political extremism score ($M = 1.57$, $SD = 1.02$), and participants' religion (categorical, 19.7% atheists).

Demographics. Finally, participants were asked to indicate their yearly income (from 1 *'less than \$10,000'* to 12 *'more than \$150,000'*, Median = 4, *'\$30,000-39,999'*), education level (from 1 *'less than high-school'* to 7 *'doctorate'*, Median = 5, *'4 years degree'*), race (30.3% non-white), gender, and age.

Analytic strategy

This time, we chose to run Pearson correlations to test our hypotheses given the consequent number of measures (limiting the number of tests thus of type I errors), and to re-run them adjusting for potential confounds (demographics, ideology). Across our three studies, all tests were two-tailed.

Results

Correlation analyses. Pearson correlations between our three conspiracy indicators and our five value scores were computed (due to their differences in Likert scaling, all

variables were Z-transformed see table 2). In line with *H1* and contrary to Study 2a & b's results, Power Distance was strongly and positively associated with GCBS ($r = .47, p < .001$), CMQ ($r = .18, p < .001$) and SCBS ($r = .56, p < .001$) scores. Replicating the results of Study 2a and in line with *H2, H3* and *H4*, Individualism was negatively linked with GCBS ($r = -.29, p < .001$), CMQ ($r = -.14, p = .011$) and SCBS ($r = -.31, p < .001$) scores and Uncertainty Avoidance was positively linked with GCBS ($r = .24, p < .001$), CMQ ($r = .14, p = .008$) and SCBS ($r = .14, p = .008$) scores, as Masculinity displayed the same predicted pattern GCBS ($r = .29, p < .001$), CMQ ($r = .55, p < .001$) and SCBS ($r = .60, p < .001$).

However, contrary to *H5* and to Study 2a's results, Long-Term Orientation was positively associated with CMQ ($r = .22, p < .001$) scores while it did not correlate with both the GCBS ($r = .04, p = .49$) and the SCBS ($r = .08, p = .14$). This last result replicates the positive but non-significant association between LTO measured at the nation level and CMQ scores observed in study 2b.

Robustness checks. Given the number of tests ($n = 28$) we adjusted our results using a Bonferroni correction. The correction showed that the vast majority of correlations were not likely due to type I errors, although the links between Individualism and CMQ scores, Uncertainty Avoidance and GCBS, SCBS scores all displayed p-values $> .10$. Also, because previous research shows that religiousness, race, gender, income, education, political ideology and extremism are all predictive of conspiracy beliefs (see Douglas, Sutton & Cichocka, 2017), we ran partial correlation analyses between our variables of interest controlling for those factors. Correlations between our constructs remained quasi-identical except for the link between Individualism and CMQ scores (though still negative it dropped to $r = -.08, p = .17$). Full-adjusted correlation matrix can be found as supplementary materials.

[INSERT TABLE 3 HERE]

Discussion

In this final study, we were able to replicate the links observed between Individualism, Masculinity and conspiracist beliefs on three different CT measures at the individual level. This bolstered our confidence in the existence of a link between those three values and adherence to CT, although the link between Individualism and CMQ scores was not robust to both adjustment and correction, which warrants further investigation. Power Distance emerged for the first time as positively linked with our CT measures, as predicted by H1 but unlike in Studies 1, 2a and 2b, which found no such links between Power Distance and CT measures. Also, the SCBS presented respondents with conspiratorial claims without any alternative viewpoints, which may bias participants' responses (see Clifford, Kim, & Sullivan, 2019). In fact, recent research suggests that measures of CTs involving contextual knowledge about the events might provide inflated numbers due to measurement artifacts (Sutton & Douglas, 2020). Finally, an important limitation pertains to the psychometric properties of both the GCBS and the CMQ, because there is no currently available data to demonstrate that either of these measures are cross-culturally invariant.

META-ANALYSIS OF STUDIES 1, 2A, 2B AND 3

In order to provide a summary of the results of our four studies, we performed a short meta-analysis using ESCI software (Cumming, 2012) on the Pearson correlations between Hofstede's values and CT measures (Figure 1). For studies 1, 2a and 2b we computed the correlation coefficients between measures aggregated at the country-level, resulting in a drastic shrinkage in sample size. Despite this power loss, CT measures displayed positive links with Masculinity, $r = .39$, 95%CI = [.18; .59], and correlated negatively with Individualism, $r = -.31$, 95%CI = [-.47; -.15], replicating our prior findings. Surprisingly, this analysis also revealed a positive association between CTs, Power Distance, $r = .41$, 95%CI = [.20; .63] and Uncertainty Avoidance, $r = .18$, 95%CI = [.12; .24], which was in line

with our expectations. Meta-analytic estimates for Long-term orientation, $r = .09$, 95%CI = $[-.01; .19]$, and Indulgence, $r = -.25$, 95%CI = $[-.51; .02]$, were inconclusive, just like in our previous studies.

[INSERT FIGURE 1 HERE]

GENERAL DISCUSSION

The present results provide support for the unique predictive power of cultural values on CT belief. Masculinity and Collectivism were robust positive predictors of CT belief across countries, operationalizations, and levels of measurement. These findings were expected and perfectly in line with the current literature on CTs, pointing at a propensity of competitive contexts to generate increased social vigilance and suspicion, especially in collectivistic contexts (Liu et al., 2019; Mashuri, & Zaduqisti, 2014; Sapountzis, & Condor, 2013). Furthermore, the replicated negative associations between individualism and CTs add another layer of cross-cultural evidence for the existence of an evolved mechanism of malevolent coalitions detection at play behind CTs (van Prooijen & van Vugt, 2018). As regards other cultural values, the inconsistent pattern of results suggests that further research is needed to determine whether their links with CT beliefs is spurious or only valid for specific types of CTs.

For instance, it was expected from the literature that a robust link would be found between Uncertainty Avoidance and CTs, but our empirical findings suggested otherwise. In fact, Uncertainty Avoidance displayed small correlations with our CTs measures in study 3 and was strongly associated with CT beliefs about the 9/11 (Study 2a). It was therefore surprising to observe no association between Uncertainty Avoidance and CMQ scores at the nation level (Studies 1, 2b). Similar results were obtained regarding Power Distance. Yet, both values did display substantial positive associations with CT measures in the meta-analysis – as theoretically expected. This discrepancy may be due to the fact that our studies

at the nation-level were performed using regression models, which provide estimates adjusting for other cultural values, unlike the meta-analysis (which relied on correlations).

In a similar vein, the negative correlations between Long Term Orientation and CTs measured at the nation level from study 2a did not replicate in study 2b and were reversed in study 3 (at the individual level). These differences in results according to measurement level and measure type might be attributable to ecological fallacy (Freedman, 1999) or stimulus sampling (Wells & Windschitl, 1999) related issues and reflect the need for further investigations.

Yet, the present studies highlighted a potent role of Masculinity and Collectivism in shaping CTs and open the way for studying the cultural processes at play behind them. In addition to this theoretical contribution, we think they might hold applied value for fighting against CTs. For instance, if Collectivism is indeed a driving force behind CTs, then interventions aiming at promoting analytical thinking skills might fail because of adverse cultural contexts, and may be improved by including a component designed to prime individualistic values (such as moralized rationality for oneself, which decreases CTs; Ståhl & van Prooijen, 2018; Adam-Troian, Caroti, Arciszewski, & Ståhl, 2019). Similarly, if Masculinity predicts CTs through increased competitiveness, specific interventions focusing on increasing social cohesion - such as promoting group activities and intergroup contact (Pagotto, Visintin, De Iorio, & Voci, 2013; Mousa, 2020) - or prosocial traits among the target public might indirectly affect CTs.

That being said, our investigation can greatly benefit from studies with more varied paradigms and a larger pool of countries, using modified priming methods from the culture-as-situated-cognition approach (see Oyserman, 2016) to assess the causal impact of culture on CT (along with mediating-moderating processes). Also, it must be noted that this first exploratory investigation relied on associations between ‘broad’ cultural constructs which

links with CT may be very straightforwardly deduced (e.g. Uncertainty Avoidance). Therefore, we propose that subsequent research should be conducted to propose a more refined theoretical analysis of the links between cultural values and CT, by taking into account more specific constructs such as Relational Mobility (Schug, Yuki, & Maddux, 2010) or Tightness-Looseness (Gelfand et al., 2011).

In line with this, finer grained investigations will be needed to identify which components of cultural values are linked with CT. For instance, while it is true that individualistic values are linked with more analytical reasoning styles, this is not systematic. In fact, individual self-construal levels are highly correlated with individual narcissism (Konrath, Bushman, & Grove, 2009) which is known to be a positive predictor of adherence to CT (Cichocka, Marchlewska, & de Zavala, 2016). This should lead us to consider that subcomponents of cultural values might differentially predict adherence to CT.

CONCLUSION

In sum, our studies provide robust preliminary evidence that cultural contexts are associated with variation in CT beliefs. It lends credence to prior theories that country-level factors may predict some CTs above and beyond individual difference factors (e.g., Hart & Graether, 2018). The present contribution can serve to encourage future research about the mechanisms through which CT beliefs are culturally shaped and reflected in situationally cued mindsets within given populations. This shift of focus from individual to more cultural-contextual factors should allow for an integrative and multi-level understanding of the processes underlying CT beliefs for both theoretical and applied purposes.

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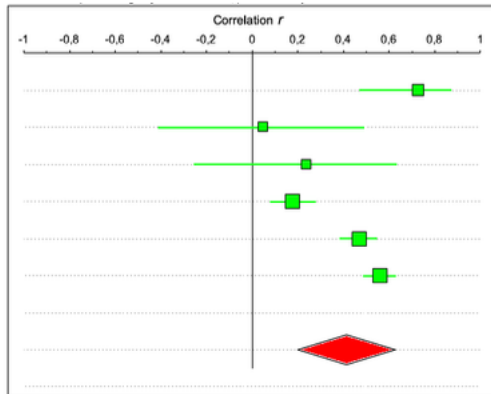
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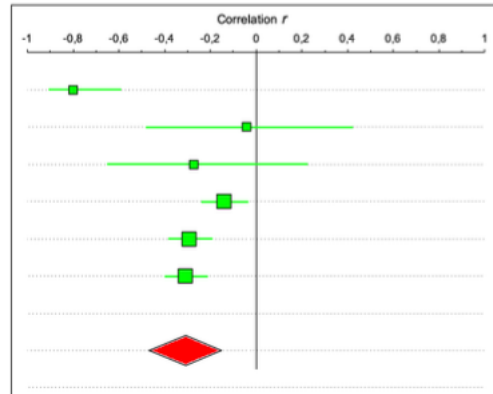
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FIGURES

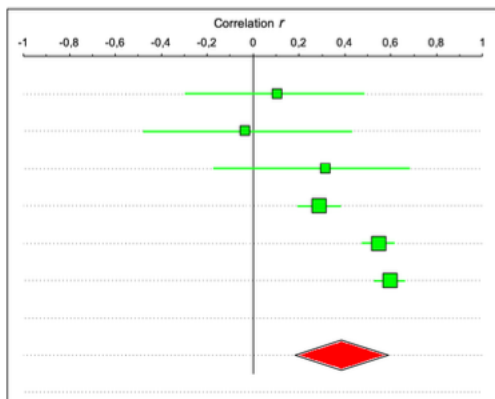
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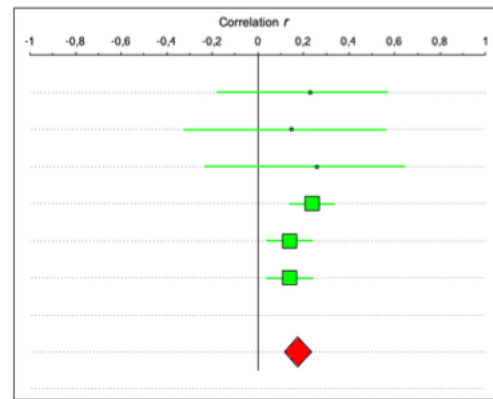
Individualism:



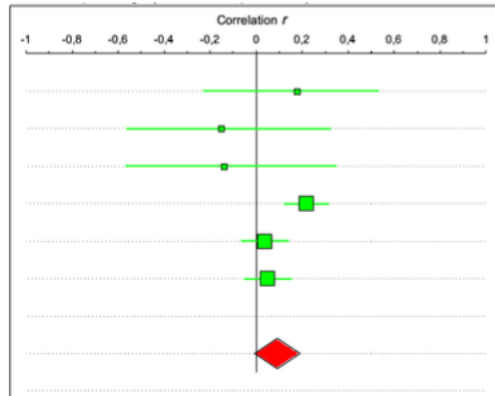
Masculinity



Uncertainty avoidance:



Long-term orientation:



Indulgence:

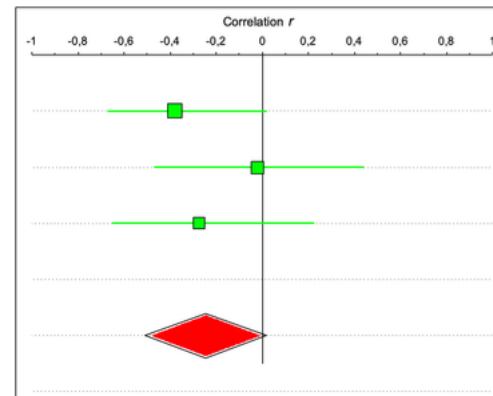


Figure 1. Forest plots of Pearson correlations between CT measures and values. The 6 lines represent respectively Study 1, Study 2a, Study 2b, Study 3 CMQ, Study 3 GCBS, and Study 3 SCBS (note: Indulgence was not included in Study 3).

TABLES

Table 1. *OLS regression model of CB according to Hofstede's 6 cultural values adjusted for HDI (N = 25, outcome = Conspiracy Beliefs Score).*

	Model Parameters					P
	SE	t	Df	b	95%CI	
<i>Hofstede Values</i>						
PD (H1)	.08	.02	22	.01	[-.21, .20]	.99
ID (H2)	.07	3.08	22	-.22**	[-.41, -.01]	.008
MS (H3)	.04	1.68	22	.07	[-.10, .17]	.11
UA (H4)	.04	.83	22	.11	[-.16, .11]	.42
LT (H5)	.05	.03	22	-.01	[-.13, .11]	.98
IN (H6)	.05	.42	22	.08	[-.28, .13]	.68
<i>Covariates</i>						
HDI	.06	1.23	22	-.24	[-.15, .32]	.24

Note. SE = standard error, CI = confidence interval; HDI = Human Development Index; PD = Power Distance; ID = Individualism; MS = Masculinity; UA = Uncertainty Avoidance; LT = Long-Term Orientation; IN = Indulgence. ** $p < .01$.

Table 2. *Regression models of CT according to Hofstede's 6 cultural values adjusted for HDI (Study 2a, binary logistic, N = 12,255, outcome = 9/11 CT rates; Study 2b, OLS, N = 30,994, outcome = CMQ scores).*

Study 2a	Model Parameters					d[95%CI]	P
	a(SE)	t	Df	O.R.	95%CI		
<i>Hofstede Values</i>							
PD (H1)	-.08(.11)	.70	17	.92	[.73, 1.17]	-.05[-.17, .09]	.49
ID (H2)	-.36(.13)	2.71	17	.70*	[.53, .92]	-.20[-.35, -.05]	.015
MS (H3)	.51(.20)	2.64	17	1.67*	[1.11, 2.52]	.28[.06, .51]	.017
UA (H4)	.54(.17)	3.15	17	1.72**	[1.20, 2.46]	.30[.10, .50]	.006
LT (H5)	-.57(.18)	3.17	17	.57**	[.39, .83]	-.31[-.51, -.10]	.006
IN (H6)	-.40(.13)	2.96	17	.67**	[.51, .89]	-.22[-.37, -.06]	.009
<i>Covariates</i>							
HDI	.20(.25)	.82	17	1.22	[.73, 2.04]	.11[-.17, .39]	.43

Study 2b	<i>SE</i>	<i>t</i>	<i>Df</i>	<i>b</i>	<i>95%CI</i>	
<i>Hofstede Values</i>						
PD (<i>H1</i>)	.24	.67	18	-.16	[-.66, .34]	.52
ID (<i>H2</i>)	.16	2.76	18	-.45*	[-.79, -.11]	.013
MS (<i>H3</i>)	.10	6.49	18	.66***	[.44, .87]	<.001
UA (<i>H4</i>)	.23	.24	18	.06	[-.43, .54]	.81
LT (<i>H5</i>)	.10	1.23	18	-.12	[-.34, .09]	.23
IN (<i>H6</i>)	.16	.62	18	.10	[-.24, .44]	.54
<i>Covariates</i>						
HDI	.22	.23	18	-.05	[-.52, .42]	.82

Note. *O.R.* = odds ratio, *SE* = standard error, *CI* = confidence interval. HDI = Human Development Index; PD = Power Distance; ID = Individualism; MS = Masculinity; UA = Uncertainty Avoidance; LT = Long-Term Orientation; IN = Indulgence. *** $p < .001$, * $p < .05$.

Table 3. Summary of Correlation Analyses between individual-level Hofstede values and Conspiracy Beliefs measures ($N = 350$; Study 3).

	1	2	3	4	5	6	7	8
1. PD	-	-	-	-	-	-	-	-
2. ID	-.49***	-	-	-	-	-	-	-
3. MS	.65***	-.41***	-	-	-	-	-	-
4. UA	-.01	-.21***	.08	-	-	-	-	-
5. LT	-.20***	-.06	-.08	.48***	-	-	-	-
6. CMQ	.18***	-.14*	.29***	.24***	.22***	-	-	-
7. GCBS	.47***	-.29***	.55***	.14**	.04	.72***	-	-
8. SCBS	.56***	-.31**	.60***	.14**	.05	.62***	.89***	-

Note. Numbers represent Pearson correlation coefficients. * $p < .05$, ** $p < .01$, *** $p < .001$. PD = Power Distance; ID = Individualism; MS = Masculinity; UA = Uncertainty Avoidance; LT = Long-Term Orientation; CMQ = Conspiracy Mentality Questionnaire; GCBS = Generic Conspiracy Beliefs Scale; SCTS = Specific Conspiracy Beliefs Scale.