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Public Sector Corruption is Fertile Ground for Conspiracy Beliefs: A Comparison Between 26 Western and Non-Western Countries

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Abstract

Research on conspiracy theories has mainly focused on psychosocial and sociodemographic factors associated with conspiracy beliefs. Little is known about factors at the nation-level that provide a breeding ground for conspiracist thinking. However, an interesting finding emerges from recent international comparisons: people living in countries with a highly corrupt public sector seem to be more likely to endorse conspiracy theories. The present study aims to replicate this finding with new data. We investigate the relationship between corruption and conspiracy beliefs across 26 Western and non-Western countries through multiple linear regression analyses and conditional inference trees. In addition to the corruption level of these countries, our statistical models include other nation-level factors known to be associated

with the prevalence of conspiracy beliefs, namely their levels of democracy, freedom of the press, social threat (unemployment and homicide rates), economic inequality, and human development (life expectancy, standard of living, and education). Our analyses confirm a robust link between public sector corruption and conspiracy beliefs that remains significant when controlling for these other factors. We suggest that public sector corruption is fertile ground for conspiracy theories because it makes them less implausible to the public.

Keywords: Conspiracy Theories; International Comparison; Public Sector Corruption; Democracy; Human Development Index; Economic Inequalities; Social Threat

I. Introduction

Conspiracy theories are typically defined as explanations of major events that involve powerful and secretive groups (the alleged conspirators) using covert and malicious activities to manipulate or deceive the public. According to Brotherton and Eser (2015: 1), what characterizes conspiracy theories is that they are “[...] claims of conspiracy which are less plausible than alternative explanations, contradict the general consensus among epistemic authorities, are predicated on weak evidence, postulate unusually sinister and competent conspirators, and are ultimately unfalsifiable”. These theories can range from relatively benign, such as the idea that the 1969 moon landing was faked, to highly consequential, such as the belief that the 9/11 attacks were an inside job or that governments are conspiring with pharmaceutical companies to hide the harmfulness of vaccines.

Conspiracy theories can have serious implications (for a review, see Jolley, Mari & Douglas, 2020). For example, it has been shown that exposure to conspiracy theories reduces trust in authorities and institutions (e.g., Einstein & Glick, 2015), decreases intentions to reduce one’s carbon footprint (Jolley & Douglas, 2014a) or to get vaccinated or have one’s children vaccinated (e.g., Jolley & Douglas, 2014b),

discourages participation in democratic life through voting (Jolley & Douglas, 2014a), and fuels prejudice (Jolley, Meleady & Douglas, 2020) and even hostile attitudes (Bilewicz et al., 2013) towards various categories of the population. Some conspiracy theories are also suspected of contributing to the radicalization of extremist groups (Bartlett & Miller, 2010; see also Amarasingam & Argentino, 2020), and several studies have found a link between endorsing Covid-19-related conspiracy theories and expressing the intention to commit violent acts (e.g., Jolley & Paterson, 2020; Levinsson et al., 2021).

1.1. Factors linked to conspiracy beliefs

Research has identified numerous psychosocial factors linked to the propensity to believe in conspiracy theories (for a recent review, see Wagner-Egger 2022). For example, distrust of authorities and institutions (e.g., Adam-Troian et al., 2023; Wagner-Egger et al., 2022) and a sense of anomie (e.g., Goertzel, 1994) have been linked to higher levels of belief in conspiracy theories. Other studies have found that individuals who feel marginalized or disempowered, as well as those who feel they lack control over the events are more likely to endorse conspiracy theories (e.g., Imhoff & Bruder, 2014; Uscinski & Parent, 2014; Whitson & Galinsky, 2008), presumably as a way of making sense of their social environment (Whitson & Galinsky, 2008) or to motivate social action aimed at changing the *status quo* (Imhoff & Bruder, 2014). Conspiracy beliefs are also linked to economic and political factors. They are more prevalent at both extremes of the political spectrum, particularly on the far right (e.g., Imhoff et al., 2022), as well as among individuals who report living in economic precarity (Adam-Troian et al., 2023).

Endorsement of conspiracy theories is sometimes seen as a symptom of gullibility (Alper, 2022), since research has shown that individuals who believe in this kind of theories are on average less educated (e.g., Van Prooijen, 2017), more intuitive than analytical in their thinking style (e.g., Pennycook, Fugelsang & Koehler, 2015), more prone to paranormal beliefs (e.g., Darwin, Neave & Holmes, 2011; Enders & Smallpage, 2019), less skilled in scientific reasoning (e.g., Čavojová, Šrol & Jurkovič, 2020) and score lower in actively open-minded thinking (e.g., Rizeq, Flora & Toplak, 2021) and need for cognition (Lobato et al.,

2014) scales. Moreover, cognitive biases such as intentionality bias (Douglas et al., 2016), which leads people to see human intentions where there are presumably none, or illusory pattern perception (van Prooijen, Douglas & De Inocencio, 2018) have been shown to be associated with the endorsement of conspiracy theories.

In comparison, less is known about the environmental factors at the nation-level that can facilitate the success of conspiracy theories (Imhoff, 2022). A few recent studies have shown, through international comparisons, that the level of conspiracy beliefs is higher in countries with lower GDP per capita (Hornsey et al., 2023; Hornsey & Pearson, 2022) and higher economic inequalities (Cordonier, Cafiero & Bronner, 2021; Hornsey & Pearson, 2022). In addition, countries' levels of collectivism and authoritarianism appear to be positively associated with their level of conspiracy beliefs (Adam-Troian et al., 2021; Hornsey & Pearson, 2022). Conversely, higher levels of democracy, freedom of the press, and human development (Cordonier, Cafiero & Bronner, 2021; Hornsey & Pearson, 2022) are associated with lower levels of conspiracy beliefs. Furthermore, conspiracy theories seem to be more successful in countries where the level of social threat is higher (e.g., higher unemployment and/or homicide rates; Cordonier, Cafiero & Bronner, 2021). One of the most interesting findings emerging from this comparative literature is that people living in countries with a highly corrupt public sector may be more likely to endorse conspiracy theories (Alper, 2022; Alper, Douglas & Capraro, 2021; Cordonier, Cafiero & Bronner, 2021; Hornsey & Pearson, 2022).

1.2. The present study

The aim of this study is to replicate with new international data the existing results suggesting that public sector corruption is fertile ground for conspiracy beliefs (Alper, 2022; Alper, Douglas & Capraro, 2021; Cordonier, Cafiero & Bronner, 2021; Hornsey & Pearson, 2022). In a previous exploratory study (Cordonier, Cafiero & Bronner, 2021), we used data from a 2019 YouGov survey on conspiracy beliefs covering 22 Western and non-Western countries to compute a Conspiracy Index for each of them. We

then conducted statistical analyses showing a positive link between the countries' Conspiracy Index and the prevalence of public sector corruption, along with other national indicators reflecting lower levels of democracy and human development, as well as higher levels of income inequalities and social threats (unemployment and intentional homicide rates). In the present study, we replicate this procedure with data from the 2020 and 2021 editions of the YouGov survey on conspiracy beliefs, made publicly available by YouGov on its website.

It is worth noting that Alper (2022) and Hornsey and Pearson (2022) also utilized data from the YouGov 2020 survey in their respective studies to demonstrate the existence of a link between corruption and conspiracy beliefs. Alper (2022) did so while controlling for the effect of several nation-level variables (GDP, educational performance, and scores on the cultural dimensions of individualism, power distance, masculinity, and uncertainty avoidance). In this study, we reanalyze the YouGov 2020 data, but in including different control variables and in calculating the countries' level of conspiracy beliefs somewhat differently – for example, we included into our 2020 Conspiracy Index a Covid-19-related conspiracy theory tested in the YouGov survey, while Alper (2022) analyzed Covid-19 conspiracy theories separately. Our analyses of the YouGov 2020 data can thus be viewed as a robustness check of previous results based on the same dataset. On the other hand, to our knowledge, the YouGov 2021 data we also analyze in this study have never been used before to assess the link between corruption and conspiracy beliefs.

It should also be noted that in this study we perform a series of control analyses on our national indicators of conspiracy beliefs (i.e., the 2020 and 2021 Conspiracy Indexes) to ascertain that they are not inherently culturally or geopolitically biased. These controls are important for substantiating that the observed association between corruption and conspiracy beliefs is not a spurious result stemming from the nature of the conspiracy theories tested in the YouGov surveys. For example, some of these conspiracy theories target the US government. Therefore, it cannot be *a priori* ruled out that higher Conspiracy

Indexes in certain countries may reflect more an anti-American or anti-Western sentiment than a stronger susceptibility to conspiracist thinking.

II. Material and Methods

2.1. Conspiracy Indexes

The YouGov surveys on conspiracy beliefs used in the present study were conducted online in 21 countries from July 30th to August 24th, 2020, and in 24 countries from August 4th to September 21st, 2021. Both surveys data are accessible on the YouGov website (the sources of all the data used in this study are indicated in the online appendix of the article). The list of countries included in the 2020 and 2021 surveys is exposed in Table 1. The sample of respondents in each country is either representative of the general population aged 18 and over, or of the online population aged 18 and over (see Table 1; note that we took this methodological difference into account in our subsequent analyses, see Results section).

In these surveys, respondents were asked to evaluate several conspiratorial statements (8 in 2020, 12 in 2021) by answering the following question: *“Would you say the following statement is true or false?”*. Response modality: *“Definitely false”*; *“Probably false”*; *“Don’t know”* (2020 edition) / *“Don’t know either way – this may be true or may be false”* (2021 edition); *“Probably true”*; *“Definitely true”* (note that both the question and the response modality have changed since the 2019 survey edition; see Cordonier, Cafiero & Bronner, 2021). The list of items tested in the 2020 and 2021 surveys on conspiracy beliefs is exposed in Table 2.

Table 1. Countries included in the 2020 and 2021 YouGov surveys and number of respondents by country

	<i>Countries</i>	<i>2020 Respondents (total N: 22,238)</i>	<i>2021 Respondents (total N: 26,276)</i>	<i>Representative of general population aged 18+</i>	<i>Representative of online population aged 18+</i>
1	Australia	1048	1076	X	
2	Brazil	1010	1117	X	

3	Canada	1021	1127	X	
4	Denmark	1024	1170	X	
5	Egypt	1016	-		X
6	France	1058	1085	X	
7	Germany	1026	1009	X	
8	Greece	1011	1045	X	
9	Hungary	1023	1012	X	
10	India	-	1212		X
11	Indonesia	-	1473		X
12	Italy	1337	1023	X	
13	Japan	1018	1155	X	
14	Kenya	-	1017		X
15	Mexico	1025	1092	X	
16	Nigeria	1007	1057		X
17	Poland	1001	1035	X	
18	Russia	-	1228	X	
19	Saudi Arabia	1003	-		X
20	South Africa	1001	1159	X	
21	Spain	1022	1035	X	
22	Sweden	1047	1038	X	
23	Thailand	-	1004		X
24	Turkey	1007	1041	X	
25	UK	1383	1062	X	
26	US	1150	1004	X	

Table 2. 2020 and 2021 YouGov surveys items

#	Items	2020	2021	Denomination and notes
1	The US Government knowingly helped to make the 9/11 terrorist attacks happen in America on 11 September, 2001.	YES	YES	September 11 conspiracy
2	The truth about the harmful effects of vaccines is being deliberately hidden from the public.	YES	YES	Vaccines conspiracy [Not tested in Thailand]
3	Regardless of who is officially in charge of governments and other organizations, there is a single group of people who secretly control events and rule the world together.	YES	YES	Secret group conspiracy [Generic item; Not tested in Thailand]

4	The idea of man-made global warming is a hoax that was invented to deceive people.	YES	YES	Global warming conspiracy
5	Humans have made contact with aliens and this fact has been deliberately hidden from the public.	YES	YES	Hidden Aliens conspiracy
6	The AIDS virus was created and spread around the world on purpose by a secret group or organization.	YES	YES	AIDS conspiracy
7	The 1969 moon landings were faked.	YES	YES	Moon hoax conspiracy
8	Coronavirus is a myth created by some powerful forces, and the virus does not really exist.	YES ¹	YES	Covid conspiracy
9	The official account of the Nazi Holocaust is a lie and the number of Jews killed by the Nazis during World War II has been exaggerated on purpose.	NO	YES	Holocaust conspiracy [Not tested in Germany]
10	A secret group of Satan-worshipping paedophiles has taken control of parts of the U.S. Government and mainstream U.S. media.	NO	YES	Pedosatanist conspiracy
11	In the 2020 US Presidential Election, certain forces in America stole the election from Donald Trump by committing systemic voter fraud that prevented him from winning.	NO	YES	2020 US Election conspiracy
12	Members of Donald Trump's election team knowingly worked with the Russian Government to help him win the 2016 US Presidential Election.	YES	YES	[Item not included in the 2020 and 2021 Conspiracy Indexes computed in this study]

¹ In the 2020 YouGov survey, this item was part of an additional set of items on beliefs about the Covid-19 pandemic. We have included it to the list of the 2020 conspiratorial items because it was also tested in the 2021 edition of the YouGov survey on conspiracy beliefs.

The 2020 edition of the survey additionally asked respondents to evaluate 10 statements related to the Covid-19 pandemic. Half of them correspond to conspiratorial statements. In the present study, we included one of these Covid-19 conspiratorial statements in our analyses: the one that YouGov also integrated in its 2021 survey on conspiracy beliefs (item #8 in Table 2). We did not include the other Covid-19 conspiratorial statements to avoid giving more weight to this topic than to other topics tested in the 2020 survey on conspiracy beliefs.

Based on the 2020 and 2021 YouGov surveys on conspiracy beliefs, we computed a Conspiracy Index

for each country, separately for both years, as follows. First, we discarded the item on Russian interference in the 2016 US elections (item #12 in Table 2). The rationale is that this item does not fit into the definition of a conspiracy theory. In particular, it lacks the characteristic retained by Brotherton & Eser (2015) of contradicting the consensus among the epistemic authorities, because there is no such consensus on the exact extent and nature of Russian interference in the 2016 US elections. Due to this lack of consensus, it is possible that reliable media sources published conflicting information on this topic. Therefore, we discarded this item to avoid introducing noise in the construction of the 2020 and 2021 Conspiracy Indexes.

Second, we calculated the average percentage of “true” responses (combining “*Probably true*” and “*Definitely true*”)¹ for each country across the remaining conspiratorial statements – that is, 8 in the 2020 survey, and 11 in the 2021 survey. These averages correspond to the “2020 8-item Conspiracy Index” of each of the 21 countries included in the 2020 survey (see Figure 1.A; Table 3), and to the “2021 11-item Conspiracy Index” of each of the 24 countries included in the 2021 survey (see Figure 1.B; Table 4). Aggregating various conspiratorial statements in this way is justified by the monological nature of conspiracy beliefs (Goertzel, 1994; Swami et al., 2011) and is a common procedure in research on conspiracy theories (e.g., Alper, 2022, Brotherton, French & Pickering, 2013; Bruder et al., 2013; Goertzel, 1994; Hornsey & Pearson, 2022; Lantian et al., 2016).

Note that YouGov did not test the *Holocaust conspiracy* item in Germany, and the *Vaccines conspiracy* and *Secret group conspiracy* items in Thailand (see Table 2). To compute the Conspiracy Indexes for these two countries, we replaced each missing data point with the mean value of the corresponding item in the

¹ The rationale for combining the “*Probably true*” and “*Definitely true*” assessments of each item, rather than considering them separately as indicators of the degree of endorsement of the tested conspiracy theories, is as follows. It cannot be ruled out that expressing strongly held opinions on a sensitive topic, such as conspiracy theories, may, to some extent, be influenced by cultural variables. There is a possibility that deeming a sensitive statement as “definitely true”, rather than “probably true”, might be easier in certain countries compared to others, where the expression of moderate opinions may be more culturally acceptable or might reflect a cautious attitude in contexts where the opportunity to freely express opinions is limited. Combining the “*Probably true*” and “*Definitely true*” responses helps to mitigate the potential confounding effect of such cultural variables.

other countries. This strategy aims to neutralize the statistical effects of the missing data, thereby avoiding the exclusion of both countries from the analyses.

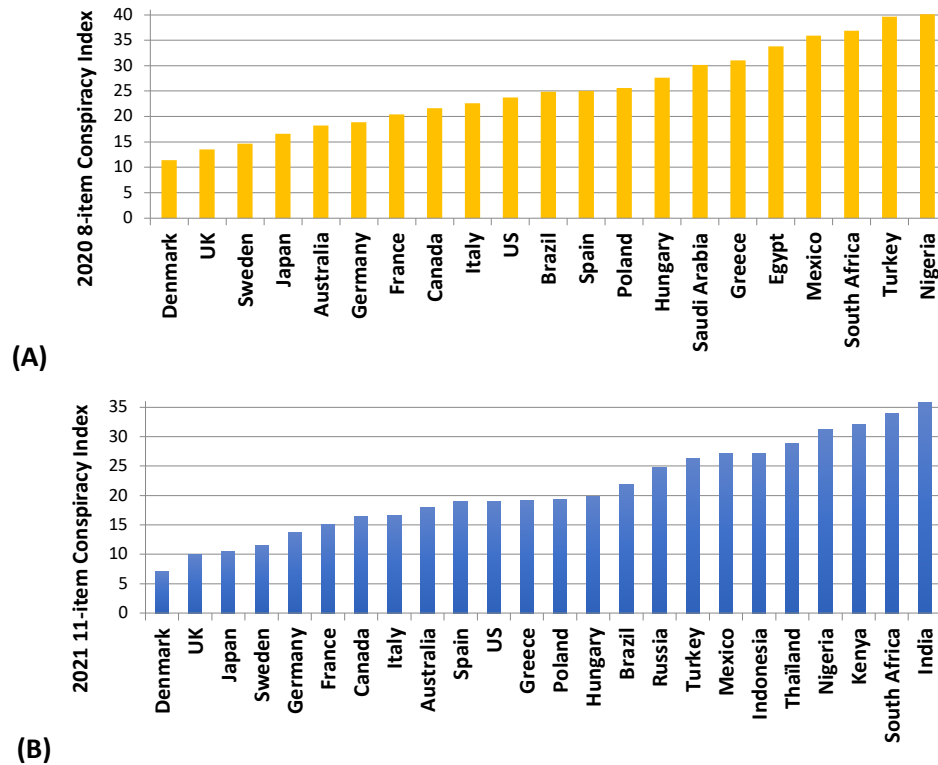


Figure 1. (A) 2020 8-item Conspiracy Index (N = 21 countries); **(B)** 2021 11-item Conspiracy Index (N = 24 countries).

Table 3. Descriptive statistics of the 2020 8-item Conspiracy Index (N = 21 countries)

	Min.	Max.	Mean	Median	SD
2020 8-item Conspiracy Index	11.38	40.13	25.34	24.88	8.35
- September 11 conspiracy (% of 'true')	8	55	26.24	23.0	11.70
- Vaccines conspiracy (% of 'true')	15	58	34.29	31.0	10.73
- Secret group conspiracy (% of 'true')	18	78	43.86	45.0	15.29
- Global warming conspiracy (% of 'true')	9	31	19.86	20.0	5.58
- Hidden Aliens conspiracy (% of 'true')	11	44	26.62	26.0	9.25
- AIDS conspiracy (% of 'true')	5	42	20.76	18.0	10.81

- <i>Moon hoax conspiracy (% of 'true')</i>	9	30	19.10	18.0	6.61
- <i>Covid conspiracy (% of 'true')</i>	3	22	12.00	11.0	5.97

Table 4. Descriptive statistics of the 2021 11-item Conspiracy Index (N = 24 countries)

	<i>Min.</i>	<i>Max.</i>	<i>Mean</i>	<i>Median</i>	<i>SD</i>
2021 11-item Conspiracy Index	7.18	35.73	21.08	19.27	7.78
- <i>September 11 conspiracy (% of 'true')</i>	7	41	21.71	19.5	9.00
- <i>Vaccines conspiracy (% of 'true')</i>	10	54	29.70	29.0	10.82
- <i>Secret group conspiracy (% of 'true')</i>	10	72	36.91	35.0	15.79
- <i>Global warming conspiracy (% of 'true')</i>	7	32	17.33	16.0	6.02
- <i>Hidden Aliens conspiracy (% of 'true')</i>	6	37	22.21	22.0	8.19
- <i>AIDS conspiracy (% of 'true')</i>	3	43	18.04	15.5	10.14
- <i>Holocaust conspiracy (% of 'true')</i>	4	35	16.61	13.0	7.84
- <i>Moon hoax conspiracy (% of 'true')</i>	9	36	17.46	16.5	7.18
- <i>Pedosatanist conspiracy (% of 'true')</i>	3	37	17.21	13.5	10.15
- <i>2020 US Election conspiracy (% of 'true')</i>	6	39	22.58	23.0	7.89
- <i>Covid conspiracy (% of 'true')</i>	3	30	12.13	10.5	6.36

Both the 2020 8-item Conspiracy Index, and the 2021 11-item Conspiracy Index have a very good internal consistency (2020 Conspiracy Index: N = 21 countries, 8 items, $\alpha = 0.94$; 2021 Conspiracy Index: N = 24 countries, 11 items, $\alpha = 0.95$) and their distribution does not significantly differ from normality (2020 Conspiracy Index: N = 21 countries, $W = 0.96$, $p = 0.61$; 2021 Conspiracy Index: N = 24 countries, $W = 0.97$, $p = 0.64$; see Figure 2).

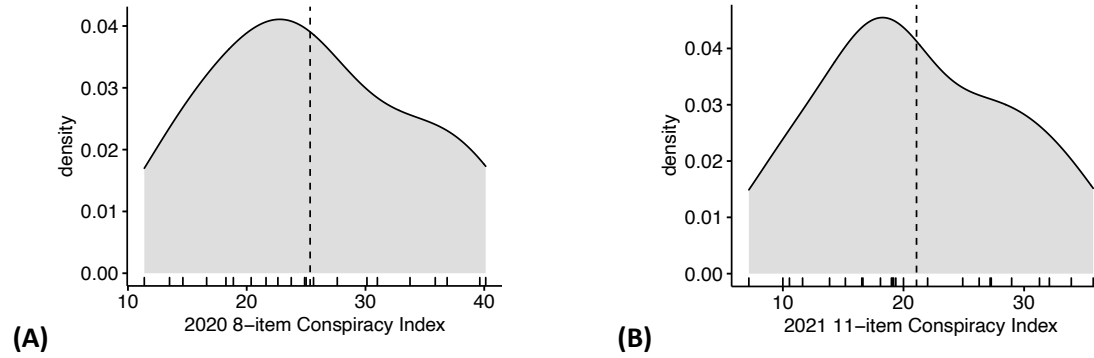


Figure 2. Density plot: **(A)** 2020 8-item Conspiracy Index (N = 21 countries); **(B)** 2021 11-item Conspiracy Index (N = 24 countries). The vertical dashed line indicates the mean value.

A potential limitation of the YouGov surveys we utilized lies in the fact that, at the nation level, the assessment of certain conspiratorial statements tested may be influenced more by cultural and geopolitical factors than by the actual prevalence of conspiracist thinking among the population. For instance, a strong anti-American sentiment in a particular country could lead respondents to endorse an item such as the *September 11 conspiracy* (item #1 in Table 2), not necessarily because they genuinely believe in this specific theory but rather to express their disdain for the US.

It turns out that an inspection of the international distribution of both the 2020 and 2021 Conspiracy Indexes might suggest that they are culturally biased, as their average level is lower in the Western than in the non-Western countries:

- Mean value of the 2020 8-item Conspiracy Index in the Western countries (N = 13; Australia, Canada, Denmark, France, Germany, Greece, Hungary, Italy, Poland, Spain, Sweden, UK, US) = 21.10; in the non-Western countries (N = 8) = 32.23; bilateral t-test: $t(19) = 3.71$, $p = 0.002$; Figure 3.A.
- Mean value of the 2021 11-item Conspiracy Index in the Western countries (N = 13) = 15.83; in the non-Western countries (N = 11) = 27.29; bilateral t-test: $t(22) = 5.07$, $p < 0.001$; Figure 3.B.

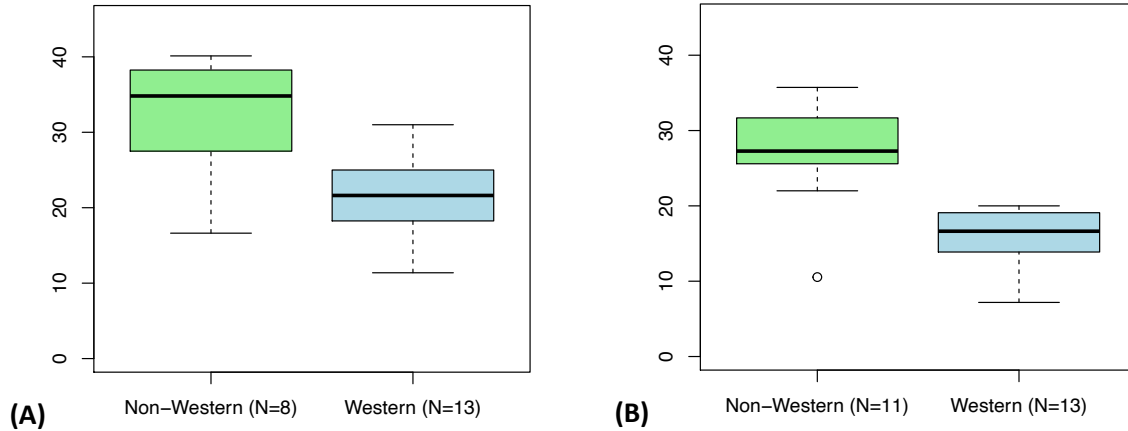


Figure 3. Comparison between non-Western and Western countries: **(A)** 2020 8-item Conspiracy Index; **(B)** 2021 11-item Conspiracy Index.

A potential bias of this kind is an issue in all studies that rely on results of international surveys to assess and compare the prevalence of conspiracy beliefs. To address this issue, psychologists have created standardized scales based on generic conspiracy items – that is, items that avoid mentioning any specific conspiracy and any specific group of conspirators (Brotherton, French & Pickering, 2013; Bruder et al., 2013). In the 2020 and 2021 YouGov surveys on conspiracy beliefs, one item is generic in this exact sense: the *Secret group conspiracy* (item #3 in Table 2).

As the *Secret group conspiracy* item is generic, responses to this item are unlikely to be biased by cultural or geopolitical variables (Bruder et al., 2013). To control whether the 2020 8-item Conspiracy Index and/or the 2021 11-item Conspiracy Index as a whole are affected by cultural or geopolitical factors, first, we recalculated them on the basis of 7 (2020 index) and 10 (2021 index) items only, excluding the generic *Secret group conspiracy* one from the calculation. Second, we compared the level of these new 2020 7-item Conspiracy Index and 2021 10-item Conspiracy Index with that of the corresponding year's *Secret group conspiracy* item. Correlation analyses show that both the 2020 7-item, and the 2021 10-item Conspiracy Indexes are strongly correlated with the *Secret group conspiracy* item of the corresponding year (2020: $R = 0.88$, $p < 0.001$; $N = 21$; 2021: $R = 0.86$, $p < 0.001$; $N = 24$; see Figure 4). This clearly suggests

that neither the 2020 8-item Conspiracy Index nor the 2021 11-item Conspiracy Index are inherently biased.

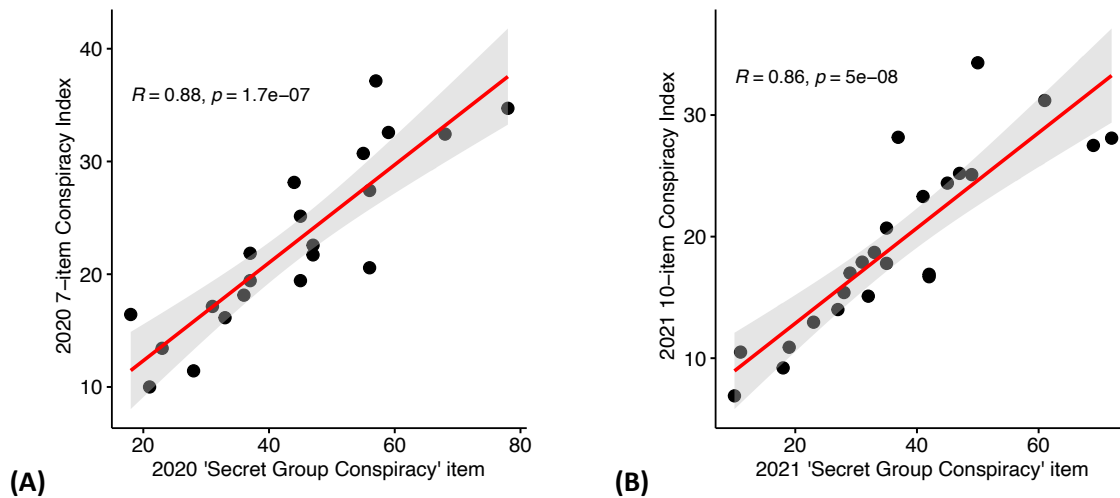


Figure 4. Pearson’s correlation between **(A)** the 2020 7-item Conspiracy Index and the 2020 generic “Secret group conspiracy” item (N = 21 countries); **(B)** the 2021 10-item Conspiracy Index and the 2021 generic “Secret group conspiracy” item (N = 24 countries). Each dot represents a country. Grey surface: confidence interval (95%).

Moreover, if the responses to the 2020 and 2021 YouGov surveys on conspiracy beliefs were influenced to a large extent by geopolitical divides, items reflecting those divides should be those for which the rate of endorsement varies the most across countries. It turns out that this is not the case, as it is the generic *Secret group conspiracy* item that shows the greatest cross-country variability, based on its standard deviation (see Tables 3 and 4).

Finally, as previously mentioned, the level of both Conspiracy Indexes is lower in Western than in non-Western countries. However, this difference is *not* due to a stronger endorsement of specific items within the group of non-Western countries, which could have indicated a cultural bias in the indexes. On the contrary, there is a near linear relationship between the two groups of countries in the endorsement of each of the 8 and 11 items that make up the 2020 and 2021 Conspiracy Indexes (see Figure 5).

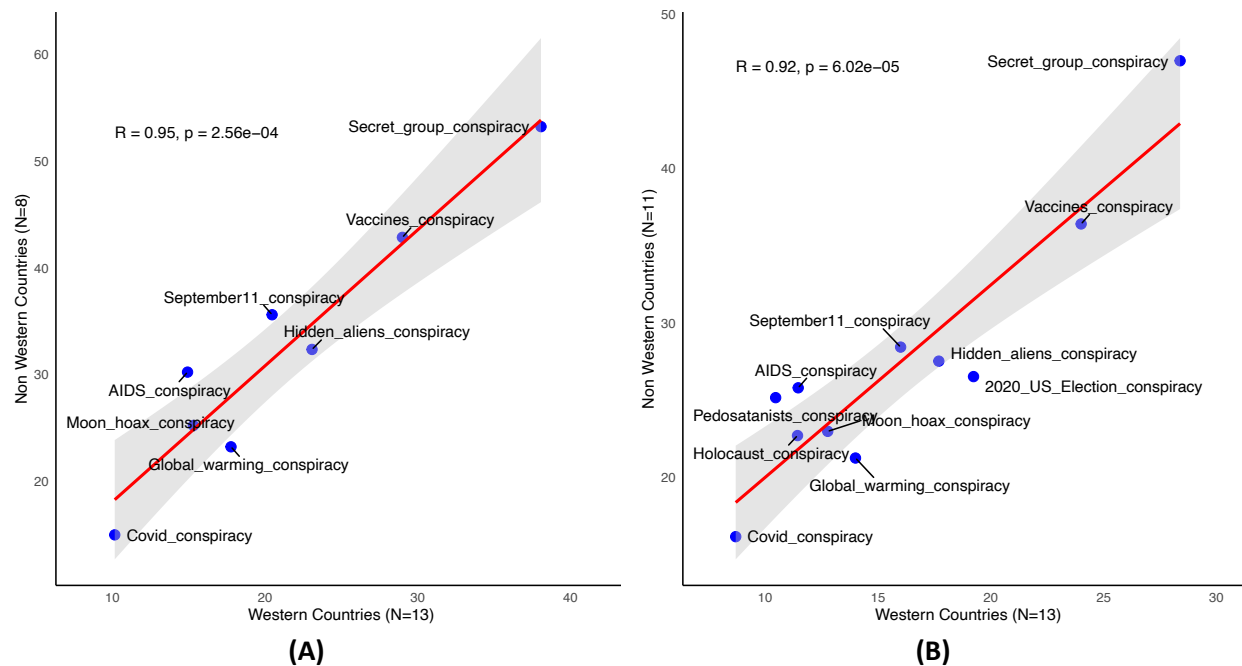


Figure 5. Pearson's correlation between non-Western and Western countries' level of **(A)** the 8 items composing the 2020 Conspiracy Index; **(B)** the 11 items composing the 2021 Conspiracy Index. Grey surface: confidence interval (95%).

Overall, the 2020 and 2021 Conspiracy Indexes both show a high degree of internal consistency and are unlikely to be significantly biased by cultural or geopolitical factors. As a result, these indexes can be reliably utilized for making cross-country comparisons of the prevalence of conspiracy beliefs.

2.2. Independent variables

The aim of this study is to corroborate the link between public sector corruption and conspiracy beliefs while controlling for other nation-level factors associated with an increased susceptibility to such beliefs. In addition to the level of corruption in the studied countries, our analyses thus encompass variables associated with their levels of democracy, social threat, inequality, and human development. The rationale for choosing these variables is as follows.

In nations with limited or no democracy, citizens lack the opportunity to actively participate in their country's political life and may face challenges accessing trustworthy information from independent media

sources. Such circumstances can contribute to an enhanced sense of political powerlessness among the population. This, in turn, could lead to elevated levels of conspiracist thinking, since it has been shown that individuals experiencing a sense of powerlessness are more susceptible to conspiracy beliefs (Abalakina-Paap et al., 1999; Van Prooijen and Acker, 2015). At the nation-level, studies have in fact found that low levels of democracy and freedom of the press are associated with a higher prevalence of conspiracy beliefs (Cordonier, Cafiero & Bronner, 2021; Hornsey & Pearson, 2022). Consequently, we have incorporated these two variables into our analyses.

Additionally, research shows that social conditions associated with threat and insecurity are linked with increased conspiratorial ideation (Cordonier, Cafiero & Bronner, 2021; DiGrazia, 2017; Goertzel, 1994). Therefore, we have incorporated in our analyses the national rates of unemployment and intentional homicides – two indicators of social threat for which reliable and comparable measures exist across countries.

Lastly, studies have found that elevated economic inequality, lower standard of living or income levels, and less education are associated with heightened conspiracy beliefs (Cordonier, Cafiero & Bronner, 2021; Casara, Suitner & Jetten, 2022; Douglas et al., 2016; Drochon, 2018; Hornsey et al., 2023; Hornsey & Pearson, 2022; Mancosu, Vassallo & Vezzoni, 2017; Van Prooijen, 2017). To account for these factors, we have included the countries' Gini Index and Human Development Index in our analyses.

The subsequent sections provide an overview of these variables. All data utilized for this study were collected in March 2023 (data sources are referenced in the online appendix of the article). Descriptive statistics for the variables are presented in Tables 5 and 6.

2.2.1. Corruption

Corruption (reversed Corruption Perception Index)

The Corruption Perceptions Index (CPI) is published annually by Transparency International. This indicator scores countries depending on how corrupt their public sector is perceived to be by experts (*via* calibrated questionnaires and surveys). Corruption is defined as the misuse of public power for private benefit. Contrary to what its name might suggest, and to what we indicated in our exploratory study (Cordonier, Cafiero & Bronner, 2021), the CPI reflects only the perception of experts, not that of the public. Nevertheless, it is highly correlated with indicators based on citizens' perception of corruption, such as their reported experience with bribery.² A country's CPI score indicates the level of public sector corruption on a scale of 0-100, where 0 means that a country is highly corrupt. In this study, we reversed the polarity of the index using the following transformation for each country: "Reversed CPI" = (100 – country' CPI score). Thus, the higher the value of the "reversed CPI" (referred to as "Corruption" thereafter), the stronger the corruption.

2.2.2. Democracy

Freedom of the press (reversed World Press Freedom Index)

The World Press Freedom Index (WPFI) is an annual index computed by Reporters Without Borders in 180 countries. This index incorporates for each country both quantitative and qualitative data on media pluralism, independence, self-censorship, legislative framework, transparency, quality of the infrastructure supporting the production of news, and abuses and acts of violence against journalists.³ A higher WPFI value indicates less freedom of the press. In this study, we reversed the polarity of the index using the following transformation for each country: "Reversed WPFI" = (100 – country' WPFI score). Thus,

² See: https://images.transparencycdn.org/images/2020_CPI_FAQs_ENv2.pdf

³ See: <https://rsf.org/en/index-methodologie-2013-21>

a higher value for the “Reversed WPFI” (referred to as “Freedom of the press” thereafter) indicates greater freedom of the press.

Democracy Index

The Democracy Index is compiled each year by the Economist Intelligence Unit based on five categories of nation-level factors: electoral process and pluralism, the functioning of government, political participation, political culture, and civil liberties (Economist Intelligence Unit, 2021). A higher Democracy Index for a country indicates a higher level of democracy.

2.2.3. Social threat

Unemployment

The 2020 and 2021 national unemployment rates utilized in this study are sourced from World Bank. They are expressed in % of total labor force (modeled ILO estimate).

Intentional homicides

The national intentional homicide rates utilized in this study (latest available data point for each country) are sourced from the World Bank. They correspond for each country to the number of homicides per 100,000 people. The World Bank specifies that “Intentional homicides are estimates of unlawful homicides purposely inflicted as a result of domestic disputes, interpersonal violence, violent conflicts over land resources, intergang violence over turf or control, and predatory violence and killing by armed groups.”⁴

2.2.4. Inequality, life expectancy, standard of living, and education

Gini Index (inequality index)

⁴ <https://databank.worldbank.org/metadataglossary/world-development-indicators/series/VC.IHR.PSRC.P5>

The Gini Indexes utilized in this study (latest available data point for each country) are sourced from the US Central Intelligence Agency. The CIA describes the Gini Index as follows: “Gini index measures the degree of inequality in the distribution of family income in a country. [...] If income were distributed with perfect equality the index would be zero; if income were distributed with perfect inequality, the index would be 100.”⁵

Human Development Index

The Human Development Index (HDI) is calculated annually by the United Nations Development Programme. The UNDP describes this indicator as follows: “The HDI is a summary measure of average achievement in key dimensions of human development [...]. The health dimension is assessed by life expectancy at birth, the education dimension is measured by mean of years of schooling for adults aged 25 years and more and expected years of schooling for children of school entering age. The standard of living dimension is measured by gross national income per capita”.⁶

Table 5. Descriptive statistics of the 2020 independent variables (N = 21 countries)

	<i>Min.</i>	<i>Max.</i>	<i>Mean</i>	<i>Median</i>	<i>SD</i>
<i>1) Corruption</i>					
2020 Corruption (reversed CPI)	12.00	75.00	41.76	44.00	18.70
<i>2) Democracy</i>					
2020 Freedom of the press (reversed WPI)	37.86	91.87	71.23	76.15	14.23
2020 Democracy Index	2.08	9.26	7.05	7.74	2.02
<i>3) Social threat</i>					
2020 Unemployment rate (% of total labor force)	2.80	24.34	8.70	7.94	5.19
Intentional homicides (per 100K people; latest available data)	0.25	33.46	6.22	1.12	10.16

⁵ <https://www.cia.gov/the-world-factbook/field/gini-index-coefficient-distribution-of-family-income/country-comparison>

⁶ https://knowledge4policy.ec.europa.eu/dataset/ds00071_en

4) *Income, inequality, and education*

Gini Index (latest available data)	27.70	63.00	36.76	34.30	8.18
2020 Human Development Index (HDI)	0.54	0.95	0.86	0.89	0.10

Table 6. Descriptive statistics of the 2021 independent variables (N = 24 countries)

	<i>Min.</i>	<i>Max.</i>	<i>Mean</i>	<i>Median</i>	<i>SD</i>
<i>1) Corruption</i>					
2021 Corruption (reversed CPI)	12.00	76.00	45.79	47.50	19.59
<i>2) Democracy</i>					
2021 Freedom of the press (reversed WPI)	50.21	92.76	70.75	71.14	12.26
2021 Democracy Index	3.24	9.26	7.05	7.31	1.61
<i>3) Social threat</i>					
2021 Unemployment rate (% of total labor force)	0.99	28.77	7.67	5.50	5.73
Intentional homicides (per 100K people; latest available data)	0.25	33.46	6.10	1.29	9.53
<i>4) Income, inequality, and education</i>					
Gini Index (latest available data)	27.70	63.00	36.72	34.95	7.40
2021 Human Development Index (HDI)	0.54	0.95	0.83	0.88	0.12

III. Results

Figures 6 and 7 expose the correlations between the 2020 and 2021 Conspiracy Indexes and the independent variables detailed in the previous section. The Conspiracy Indexes for both years are positively correlated with Corruption (2020: $R = 0.91$, $p < 0.001$; 2021: $R = 0.87$, $p < 0.001$; see Figure 8), Intentional homicides (2020: $R = 0.55$, $p = 0.009$; 2021: $R = 0.52$, $p = 0.009$), and Gini Index (2020: $R = 0.52$, $p < 0.015$; 2021: $R = 0.59$, $p = 0.002$) and are negatively correlated with Freedom of the press (2020: $R = -$

0.70, $p < 0.001$; 2021: $R = -0.72$, $p < 0.001$), Democracy Index (2020: $R = -0.76$, $p < 0.001$; 2021: $R = -0.71$, $p < 0.001$), and HDI ($R = -0.79$, $p < 0.001$; 2021: $R = -0.87$, $p < 0.001$).

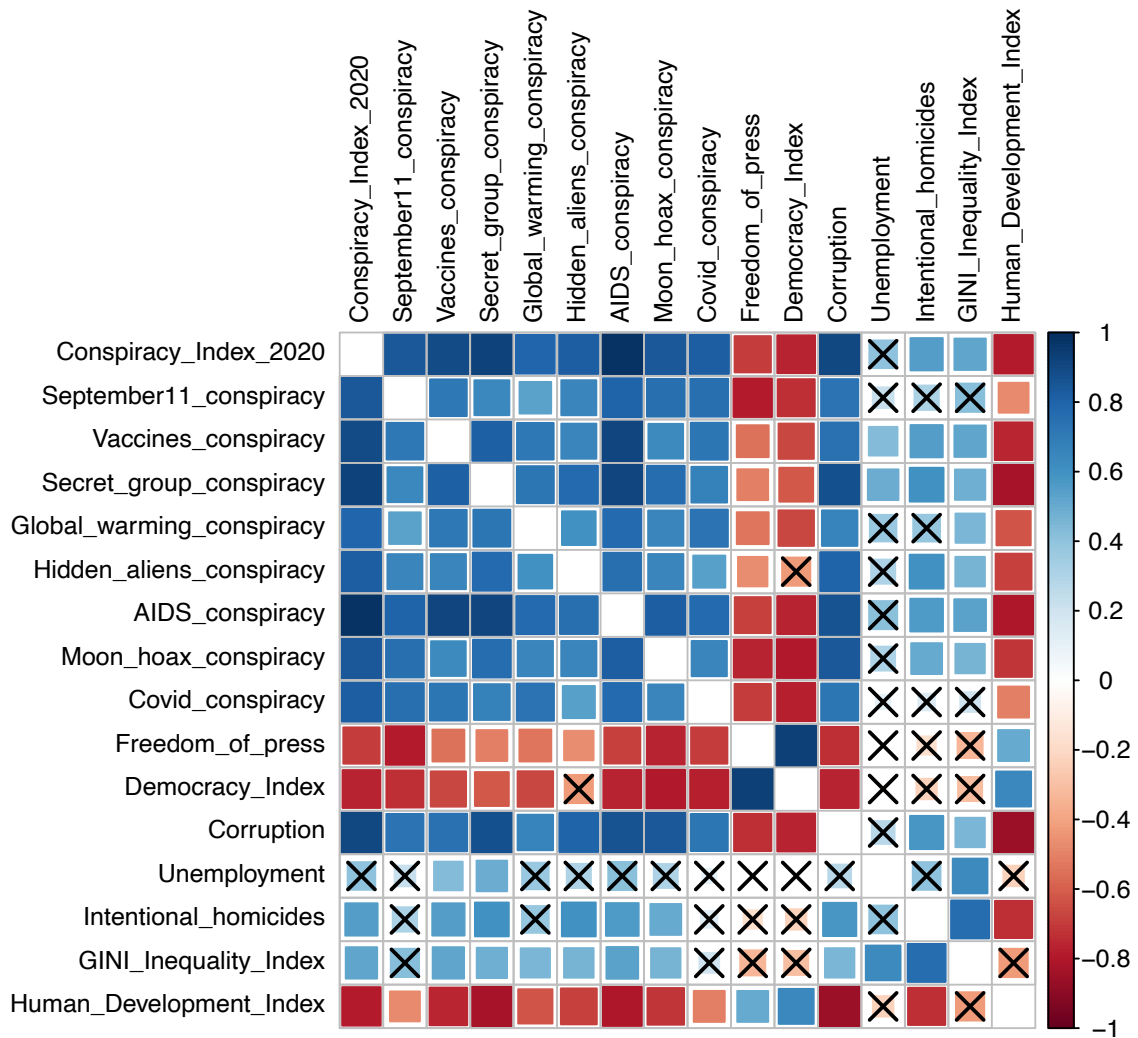


Figure 6. 2020 8-item Conspiracy Index (N = 21 countries): Pearson's correlations between all the variables. Correlation coefficients (R) not crossed out are statistically significant ($p < 0.05$).

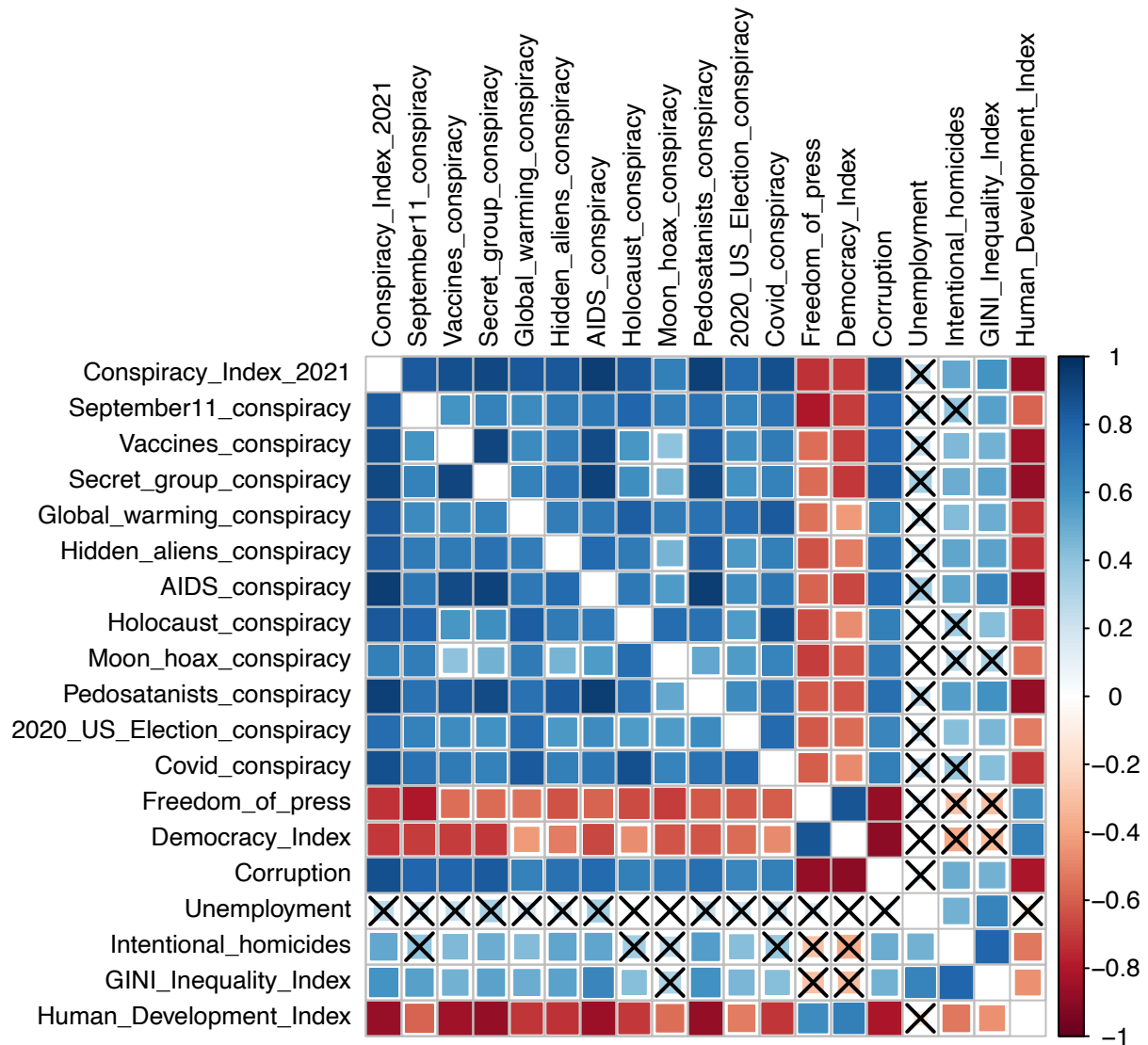


Figure 7. 2021 11-item Conspiracy Index (N = 24 countries): Pearson's correlations between all the variables. Correlation coefficients (R) not crossed out are statistically significant ($p < 0.05$).

As can also be seen in Figures 6 and 7, countries' level of corruption is positively correlated with their Gini index (2020: $R = 0.46$, $p = 0.036$; 2021: $R = 0.47$, $p = 0.020$), and homicide rate (2020: $R = 0.59$, $p = 0.005$; 2021: $R = 0.49$, $p < 0.015$) and negatively with their HDI (2020: $R = -0.86$, $p < 0.001$; 2021: $R = -0.82$, $p < 0.001$), democracy index (2020: $R = -0.77$, $p < 0.001$; 2021: $R = -0.89$, $p < 0.001$), and freedom of the press (2020: $R = -0.74$, $p < 0.001$; 2021: $R = -0.87$, $p < 0.001$).

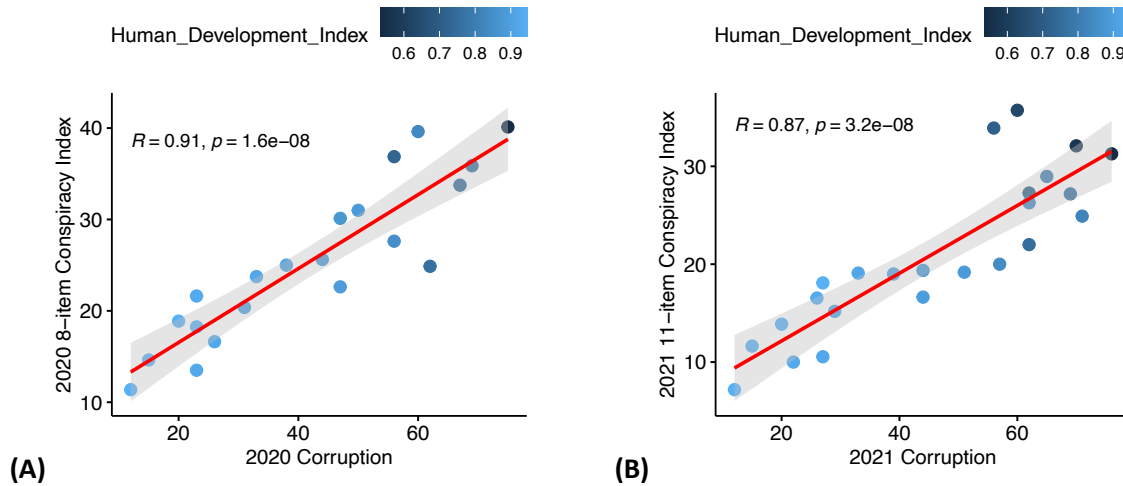


Figure 8. Pearson's correlation: **(A)** between the 2020 8-item Conspiracy Index and the 2020 Corruption level (N = 21 countries); **(B)** between the 2021 11-item Conspiracy Index and the 2021 Corruption level (N = 24 countries). Each dot represents a country. Grey surface: confidence interval (95%).

To assess the influence of corruption on the prevalence of conspiracy beliefs, while taking into account the correlations between the independent variables, we conducted stepwise multiple linear regression analyses (stepwise variable selection based on Akaike information criterion) with the Conspiracy Indexes as dependent variables and Corruption, Freedom of the press, Democracy Index, Unemployment, Intentional homicides, Gini Index, and HDI as independent variables. As exposed in Tables 7 and 8, the best-fitted model obtained is not the same for the 2020 Conspiracy Index as for the 2021 Conspiracy Index. However, in both cases, Corruption is retained in the best-fitted model and is significantly and positively associated with the variance of the Conspiracy Index.

As indicated in the Material and Methods section, in some countries the sample of respondents is representative of the general population, while in other countries it is representative of the online population. To control for this potential bias, we recalculated the same multiple linear regression analyses with the addition of the type of representativeness of the sample as an independent variable (binary

coding: 0 = sample representative of the general population, 1 = sample representative of the online population).

Table 7. Stepwise multiple linear regression analysis, best-fitted model (stepwise variable selection based on Akaike information criterion). Dependent variable: 2020 8-item Conspiracy Index (N = 21 countries). Independent variables included in the initial model: Corruption, Freedom of the press, Democracy Index, Unemployment, Intentional homicides, Gini Index, HDI.

	<i>Estimate</i>	<i>Std. Error</i>	<i>t-value</i>	<i>p-value</i>
Corruption	0.292	0.065	4.468	< 0.001 ***
Unemployment	0.346	0.152	2.278	0.036 *
Democracy Index	-1.039	0.584	-1.781	0.093
Residual standard error: 3.337 on 17 degrees of freedom; Multiple $R^2 = 0.871$; Adjusted $R^2 = 0.848$; F-statistic: 38.16 on 3 and 17 DF; $p < 0.001$.				

Table 8. Stepwise multiple linear regression analysis, best-fitted model (stepwise variable selection based on Akaike information criterion). Dependent variable: 2021 11-item Conspiracy Index (N = 24 countries). Independent variables included in the initial model: Corruption, Freedom of the press, Democracy Index, Unemployment, Intentional homicides, Gini Index, HDI.

	<i>Estimate</i>	<i>Std. Error</i>	<i>t-value</i>	<i>p-value</i>
Corruption	0.166	0.057	2.901	0.009 **
Intentional homicides	-0.178	0.115	-1.545	0.139
Gini Index (Inequality Index)	0.371	0.144	2.580	0.018 *
Human Development Index	-31.126	9.436	-3.298	0.004 **
Residual standard error: 3.079 on 19 degrees of freedom; Multiple $R^2 = 0.876$; Adjusted $R^2 = 0.850$; F-statistic: 33.56 on 4 and 19 DF; $p < 0.001$.				

Results show that the best-fitted model obtained for the 2020 Conspiracy Index remains unchanged. On the other hand, as exposed in Table 9, the best-fitted model obtained for the 2021 Conspiracy Index is no longer the same when including this additional independent variable. But in this case too, Corruption is included in the best-fitted model and is positively and significantly associated with the Conspiracy Index (see Table 9).

Table 9. Stepwise multiple linear regression analysis, best-fitted model (stepwise variable selection based on Akaike information criterion). Dependent variable: 2021 11-item Conspiracy Index (N = 24 countries). Independent variables included in the initial model: Corruption, Freedom of the press, Democracy Index, Unemployment, Intentional homicides, Gini Index, HDI, Sample representative of the online population (*versus* of the general population).

	<i>Estimate</i>	<i>Std. Error</i>	<i>t-value</i>	<i>p-value</i>
Corruption	0.210	0.041	5.061	< 0.001 ***
Unemployment	0.210	0.143	1.462	0.160
Gini Index (Inequality Index)	0.239	0.122	1.962	0.065
Sample representative of the online population (<i>versus</i> of the general population)	7.720	1.799	4.293	< 0.001 ***
Residual standard error: 2.776 on 19 degrees of freedom; Multiple $R^2 = 0.899$; Adjusted $R^2 = 0.878$; F-statistic: 42.36 on 4 and 19 DF; $p < 0.001$.				

Overall, the level of corruption in a country does seem to influence the propensity of its population to endorse conspiracy beliefs. To further explore this result, we utilized Conditional Inference Trees (CIT; *ctree* function in *partykit* R package; Hothorn et al., 2015). While stepwise multiple regression is confined to linear additive relationships, CIT analysis allows for exploring nonlinear and interactive relationships. This method utilizes conditional inference tests to determine meaningful splits, thereby providing a statistically robust and flexible approach to model complex relationships among variables. The CIT procedure looks for the variable that best splits the data into two groups, i.e., the partitioning that accounts for the maximum variance in the dependent variable. This procedure is then recursively applied to each subgroup independently until no further enhancements can be achieved.

We computed CIT with, as for the previous multiple regression analyses, the Conspiracy Indexes as dependent variables and all the national variables, including the type of panel representativeness, as independent variables. Results show that for both the 2020 and 2021 Conspiracy Indexes, only one inner node is selected by the computation: the level of corruption of the countries (Figure 9). Accordingly, this

variable is by itself the one that leads to the best split between the countries according to their level of conspiracy beliefs.

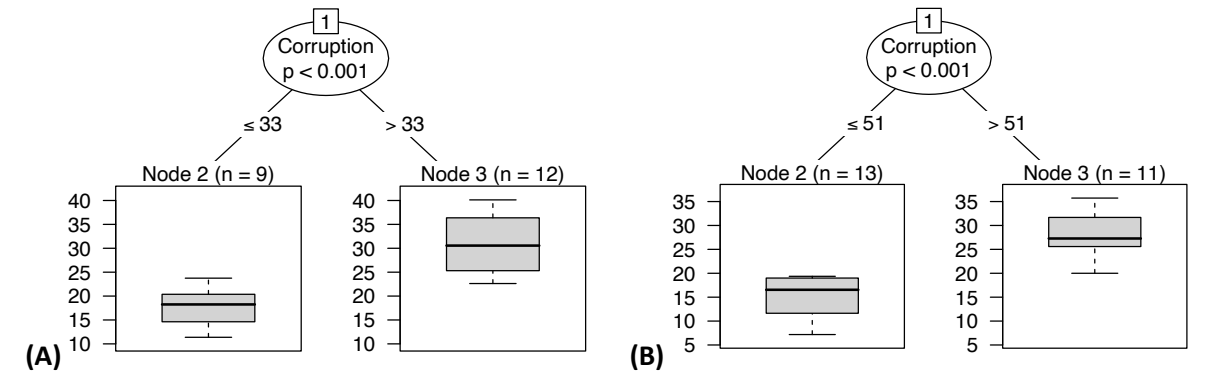


Figure 9. Conditional inference tree: **(A)** 2020 8-item Conspiracy Index (N = 21 countries); **(B)** 2021 11-item Conspiracy Index (N = 24 countries). Independent variables included in the model: Corruption, Freedom of the press, Democracy Index, Unemployment, Intentional homicides, Gini Index, HDI, Sample representative of the online population (*versus* of the general population).

IV. Discussion

International comparisons have shown that the prevalence of conspiracy beliefs is higher in countries with elevated levels of public sector corruption (Alper, 2022; Alper, Douglas & Capraro, 2021; Cordonier, Cafiero & Bronner, 2021; Hornsey & Pearson, 2022). In this study, we replicated this finding using two annual surveys on conspiracy theories covering a total of 26 Western and non-Western countries. Data of one of these surveys have already been used to explore the link between corruption and conspiracy beliefs, but we reanalyzed it somewhat differently in this study, while, to our knowledge, data of the other survey have never been used for this purpose. Our correlational and multiple regression analyses of these two datasets confirm a strong association between countries' level of corruption and the prevalence of conspiracy beliefs among their population. This holds true when controlling for nation-level variables related to democracy, social threats, inequalities, and human development. Additional analyses using

conditional inference trees demonstrate that, among all these variables, public sector corruption is the one that best distinguishes between countries based on their level of conspiracy beliefs.

Due to the risk of ecological fallacy (i.e., making spurious inferences about individuals based on aggregate data), it is hazardous to attempt an explanation of how the national level of corruption may influence individuals' conspiracy beliefs. With this limitation in mind, we nevertheless propose the following hypothesis. The countries' corruption indicator used in this study is based on experts' assessments, not on public opinion polls. However, it is known to correlate highly with indicators which are based on citizens' perceptions of public sector corruption, such as their reported experience with bribery.⁷ Therefore, it is likely that in countries where the corruption indicator we used is high, the population perceives its institutions as highly corrupt, and thus as untrustworthy. Since it has been shown that distrust of institutions and the government is a predictor of conspiracy beliefs at the individual-level (e.g. Adam-Troian et al., 2023; Wagner-Egger et al., 2022), it is reasonable to think that a highly corrupt country offers fertile ground for conspiracy theories. Indeed, all else being equal, in such a country a higher proportion of the population has good reason to distrust its institutions and government than in a less corrupt one.

It is clearly not irrational for people not to trust their institutions and government when they are corrupt, and thus to believe that they may be lying to them or hiding important facts. In a sense, public sector corruption makes conspiracy theories less implausible. Put differently, in a highly corrupt country, not all conspiracy beliefs are necessarily a sign of gullibility. This assumption is supported by Alper's (2022) study, which suggest that individual factors associated with gullibility play a lesser role in the endorsement of conspiracy theories in countries where corruption is high than in those where it is low.

⁷ https://images.transparencycdn.org/images/2020_CPI_FAQs_ENv2.pdf

From a slightly different perspective, Hornsey and Pearson (2022: 3) propose that “Rather than being a result of flawed cognition per se, conspiracist thinking might emerge in contexts where official versions of information are unreliable; a kind of rational skepticism.” However, while rampant public sector corruption may understandably lead citizens to suspect the possibility of conspiracies on the part of their institutions or government (a kind of “rational skepticism”), there would be no reason to generalize this possibility to events that do not depend directly and solely on them. Yet, in our study, we found strong correlations between the countries’ level of corruption and the level of endorsement of each of the conspiracy theories tested, including those concerning events over which the government or institutions of most of the countries covered by the study have little to no control (for instance, conspiracy theories about global events or those explicitly and exclusively targeting the US government). Thus, the legitimate distrust of corrupt institutions may lead citizens to become overly suspicious about the functioning of the social world in general. In other words, the “rational skepticism” stemming from living in a highly corrupt country could easily transform into a “sub-rational overgeneralized suspicion.”

These assumptions should be tested in further studies. A crucial initial step would be to establish the relationship between conspiracy beliefs and the perception of public sector corruption at the individual-level.

Data Accessibility: All data used in this study are publicly available. Data sources are referenced in the online appendix of the article.

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