The Factor Structure of Conspiracist Beliefs

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Abstract

Conspiracy theories are endorsed by a substantial minority of the population, however little research has specifically studied this group distinct from the mainstream public. This study employed a 100 item questionnaire to assess both the attitudes and beliefs relevant to belief in conspiracy theories. Attitudes were assessed using 15 questions indicative of trust in mainstream institutions, and beliefs were measured with 85 questions assessing endorsed belief in a wide variety of conspiracy-theoretic statements. Respondents (N = 191) spanned a broad spectrum of endorsed beliefs, attitudes towards institutions, and self-identity. A lack of trust in mainstream institutions and authority figures was significantly correlated with the extent of belief in conspiracy theories (r = 0.80, p < 0.001). Conspiracist belief was found to have six dimensions: generic conspiracist beliefs, beliefs about aliens, flat Earth beliefs, beliefs about faked events, beliefs about climate change, and beliefs about Jewish conspiracies.

Introduction

A conspiracy is any cooperation between multiple parties to engage in illegal or immoral acts. A conspiracist belief is then any belief that involves allegations of conspiracy. A definition of conspiracist belief commonly applied in academic psychology is "the unnecessary assumption of conspiracy when other explanations are more probable" (Aaronovitch, 2009, p. 5). Other theorists have proposed that conspiracy theory is a heterodox field of sociology studying the use of deception by elites in society (Zimmer, 2022). According to this definition, a conspiracist belief is one that implicates the actions of elites as the causal factor behind events, where this causation has been obscured by deception. Although not currently recognized as an academic discipline, conspiracy theory has been used to criticize elites since at least the 14th century (Bubert, 2021).

Individuals who endorse one conspiracy theory are more likely to endorse other unrelated conspiracy theories (Goertzel, 1994), however research has not been done to evaluate whether this conditional probability applies to all possible conspiracy theories. Consequently, the factor structure of the full gamut of conspiracist belief is as yet unknown. Consequently it is also unknown if different varieties

of conspiracist belief are predicted by different psychological variables. For instance, those with dissimilar levels of intelligence or education may believe different conspiracy theories, or may believe in the same conspiracies for different reasons, as was demonstrated in King et al. 2021. In that study, the two groups highest in vaccine hesitancy were those with only a high school education and those with a PhD; vaccine hesitancy has been argued to be the result of belief in conspiracy theories (Yang et al., 2021). Overlapping beliefs grounded in different reasoning between groups with high and low IQ is sufficiently well known in the lay population that it has become the subject of a popular meme format (see Figure 1 in supplemental materials).

Previous research

Previous work in understanding the psychometric structure of conspiracy belief has relied on survey questions that are either worded in a general, non-specific fashion, or else focus on a small number of events (possibly a single event), such as those of 9/11 in the US or 7/7 in the UK (Swami et al., 2010; Swami et al., 2011). The most psychometrically validated measure of conspiracist belief is the Generic Conspiracist Beliefs Scale (GCB) (Brotherton et al., 2013). As the name suggests, this survey uses questions that are general and non-event-based, and finds five highly correlated factors, named Government Malfeasance, Extraterrestrial Cover-Up, Malevolent Global Conspiracies, Personal Wellbeing, and Control of Information. The GCB however has a weakness in the Extraterrestrial Cover-Up factor, which correlates least with the overall scale score, at 0.73, while the other four factors correlate at a minimum of 0.87 (average 0.90). This weakness, and consequently the reduced correlation, is due to the fact that cover-ups are only one form of conspiracist belief pertaining to aliens. Another mutually exclusive belief is that aliens or UFO sightings have been invented wholesale by the government as part of a psychological operation to deceive the populace. Arguably this is a *more* conspiratorial scenario than a simple cover-up, and yet a respondent with this belief would score zero on this factor, which makes up 20% of the overall score on this assessment. A better evaluation of conspiracist beliefs would need to take into account the fact that multiple mutually exclusive conspiracy theories may exist around a single topic.

Previous research has also looked at the correlates of high levels of conspiracy belief. Such measures include scales of interpersonal trust, institutional trust, anomie, the Australian sheep-goat scale (Thalbourne and Delin, 1993) measuring belief in the paranormal, the Peters delusions inventory (Peters et al., 2004), need for cognition, desirability of control, five-factor personality models, and the core ontological confusions scale (Lindeman and Aarnio, 2007). Moderate correlations with generic conspiracist belief were found with interpersonal trust, anomie, the ASGS, and the PDI (Brotherton et al., 2013) as well as with core ontological confusions (Lobato, 2014) and institutional trust (McKernan et al., 2023; Miller et al., 2016; Castanho Silva et al., 2017). Correlations with

desireability of control, need for cognition, and personality factors were weak or not statistically significant (Lobato, 2014).

Previous research has also treated conspiracist belief as a monological construct (Swami et al., 2011) due to the high correlation between individual questions on surveys. While it is true that there is a central dimension of conspiracist belief, the present study indicates that conspiracist belief is comprised of distinct constellations of beliefs, likely with different epistemological and psychological foundations.

Current study

Thus far no studies have made an effort to assemble a large variety of questions representative of the diverse range of conspiracist beliefs that are endorsed by self-identified conspiracy theorists. In order to address the earlier-noted problem with the Extraterrestrial Cover-Up factor of the GCB, mutually contradictory questions are included, such as that JFK was assassinated by multiple shooters or that his death was faked. As is typical in psychology, most studies rely on convenience samples of students in university psychology courses, or through posts on psychology websites or forums. These surveys therefore are not able to sample the vast majority of self-identified conspiracy theorists, as they come from diverse backgrounds and age groups, and are not particularly likely to be found on college campuses or psychology forums.

Previous research has investigated the relationship between trust in institutions and conspiracist belief (Miller et al., 2016; Castanho Silva et al., 2017) and found positive correlations. However, their assessments of trust were relatively short and insufficiently general. Miller et al. 2016 employed four questions assessing trust in the government, the media, law enforcement, and people in general, while Castanho Silva et al. 2017 employed three questions assessing trust in politicians, Congress, and political parties. The present study assesses trusting attitudes towards institutions using 15 questions, including questions relating to political, judicial, medical, scientific, and charitable institutions.

Method

Participants and Procedure

To ensure that a wide range of conspiracist beliefs were represented, responses were solicited through a blog post and posts on a variety of online communities, including Reddit, communities.win, Discord, Telegram, and conspiracy discussion forums. Responses were also solicited through the PollPool and SurveyCircle survey sharing platforms. It should be noted that self-identified conspiracy theorists are a difficult group to collect data on, as they tend to be suspicious of any such efforts.

Numerous comments like "It is my belief that surveys are just honeypots made to harm us." were received while soliciting responses. Due to the relative rarity rarity of certain conspiracist beliefs, such as the Earth being flat, it would not have been feasible to acquire an adequate sample of such groups by surveying a representative sample of the population. Therefore, due to sampling bias, this survey is not designed to discover demographic differences between truthers and non-truthers: it is specifically intended to map the various constellations of conspiracist ideation. Although all effort was made to sample from as many diverse conspiracy-related groups as possible, there remains the possibility that some conspiracist sub-communities were missed. However, the questions are sufficiently varied and the respondents sufficiently diverse in their beliefs that it is likely that the data accurately maps conspiracist ideation as it currently exists. The survey was constructed and data was collected using the PsyToolkit software (Stoet, 2010, 2017). All data analysis was performed in Python.

Measures

The first 15 questions on the survey were Attitude questions that assessed the respondents attitudes towards institutions. The questions were based on subjective judgement, e.g. *"People are foolish to believe what they are told by government officials."* The questions were rated on a 5 point Likert scale from strongly disagree to strongly agree. The next 85 questions were Belief questions, assessing the respondent's agreement with objective statements, e.g. *"Humans have never landed on the moon."* All questions were reflective of actual beliefs propounded by various texts on conspiracy theories. For these questions the Likert scale ranged from definitely true to definitely false. All questions were positively or negatively coded based on the wording of the question, with the majority of questions being positively coded. Two questions (*"Jesus was a real historical person."* and *"IQ tests are not a valid measurement of intelligence."*) were given a neutral coding and not included in the overall belief score of the survey, as neither were overtly conspiratorial in either direction. Scores on each question ranged from 0 to 4, with a score of 4 representing the most conspiracist answer. Factor scores as well as full attitudes and beliefs scale scores were calculated by averaging the scores for all applicable questions.

Results

A total of 191 respondents completed the survey. 15 surveys were discarded due to the respondent failing the survey validation question. (*"Please select "probably false" if you completed this survey truthfully."*) Of the 176 remaining surveys, 77 reported that they self-identified as a conspiracy theorist or truther, 35 were unsure, and 59 did not identify as such. The remaining 5 respondents did not provide an answer to this question. 108 respondents were male, 57 were female, and 2 reported

"Other" gender. Of the 77 self-reported truthers, 51 were men and 22 were women, roughly the same ratio as the overall sample. Of the 165 respondents who reported their ethnicity, 131 were white and 34 were non-white. Of the 159 respondents who reported their religion, 54 were irreligious (atheist or agnostic), 61 followed a denomination of Christianity, and 44 followed another religion. The age range was 15 to 100, with a mean of 42.9 and a standard deviation of 16. The average time to complete the survey was 18.5 minutes, with a range of 4 to 138 minutes. Box plots for respondent ages and the time to the complete the survey are given in Figure 1a.

Self-reported identity was strongly associated with scores on both the attitudes and belief scales. It was, however, an imperfect proxy for the degree of conspiracist beliefs, as some who self-identified as non-truthers scored in the top 1% of respondents on both scales. Table 1 includes the means and standard deviations in attitudes and beliefs scores broken down by self-identity, along with effect sizes between groups. Effect sizes were large between the self-identified truther and non-truther groups, with d = 1.21 in attitudes scores and d = 1.47 in beliefs scores. The effects sizes between all groups on the beliefs scale were slightly larger than those found on the attitudes scale. Figure 1b contains box plots for attitudes and beliefs scores broken down by self-identity, as well as histograms graphing the same data.

Table 1

Summary Statistics for Attitudes and Beliefs Scores by Self-Identity

Group	Attitude Scores		Belief Scores	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Truther	54.4	4.9	247.9	31.7
Unsure	50.7	7.4	218.1	42.1
Non-Truther	43.6	12.2	169.7	71.6

Self-Identity Effect Size in Attitude Scores

	Unsure	Non-Truther
Truther	0.63	1.21
Unsure	-	0.66

Self-Identity Effect Size in Belief Scores

	Unsure	Non-Truther
Truther	0.84	1.47
Unsure	-	0.77

Figure 1a
Box Plots for Respondent Age and Time to Complete
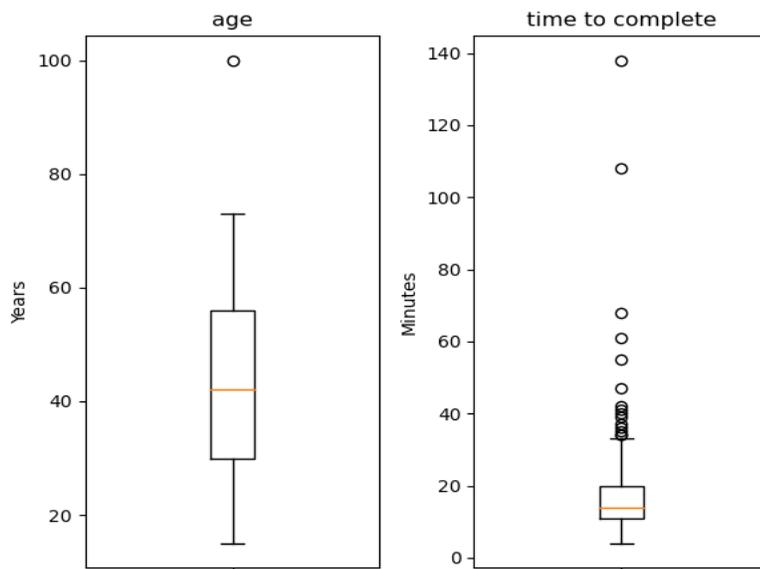
Figure 1b
Box Plots and Histograms of Attitudes and Belief Scores

Beliefs Scores

Value

3.5
3.0
2.5
2.0
1.5
1.0
0.5

Non-Truthers   Unsure   Truthers

Attitudes Scores

Value

4.0
3.5
3.0
2.5
2.0
1.5
1.0

Non-Truthers   Unsure   Truthers

Attitudes Score Distribution for Truthers, Non-Truthers, and Unsure

of Respondents

- Truthers
- Non-Truthers
- Unsure

30
25
20
15
10
5
0

Score Buckets

0.0 - 0.25 0.25 - 0.5 0.5 - 0.75 0.75 - 1.0 1.0 - 1.25 1.25 - 1.5 1.5 - 1.75 1.75 - 2.0 2.0 - 2.25 2.25 - 2.5 2.5 - 2.75 2.75 - 3.0 3.0 - 3.25 3.25 - 3.5 3.5 - 3.75 3.75 - 4.0

Beliefs Score Distribution for Truthers, Non-Truthers, and Unsure

of Respondents

- Truthers
- Non-Truthers
- Unsure

25
20
15
10
5
0

Score Buckets

0.0 - 0.25 0.25 - 0.5 0.5 - 0.75 0.75 - 1.0 1.0 - 1.25 1.25 - 1.5 1.5 - 1.75 1.75 - 2.0 2.0 - 2.25 2.25 - 2.5 2.5 - 2.75 2.75 - 3.0 3.0 - 3.25 3.25 - 3.5 3.5 - 3.75 3.75 - 4.0

Maximum scores on the beliefs scale did not exceed 3.58, equivalent to answering 74 questions with a score of 4. Numerous respondents received the maximum score of 4 on the attitudes scale. The correlation between attitude and belief scores was quite strong at 0.80, as shown in Figure 2.

Figure 2
Correlation Between Attitudes and Belief Scores
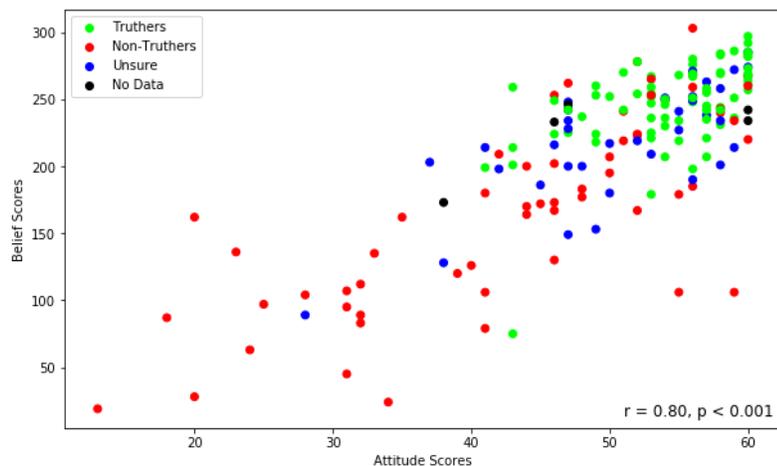
ANOVA was performed with beliefs score as the dependent variable and gender, age, educational attainment, urbanization level, religion, and ethnicity as the independent variables. None of these variables predicted a different group mean in a statistically significant way, and religion was the only variable with $p < 0.1$. Welch's unequal variances t-test was used to compare the means of the three religious groups used in the ANOVA (irreligious, Christian, and other religion). Only the means of the irreligious-other religion pair were found to differ in a statistically significant way ($p < 0.01$), with and effect size of $d = 0.559$ in favour of the 'other religion' group. The ANOVA results are reported in the supplemental data.

Exploratory factor analysis was attempted separately on both the 15 attitudes questions and the 85 beliefs questions. On the attitudes scale, both Bartlett's test of sphericity ($\chi^2 = 1333.83$, $p < 0.001$) and the Kaiser-Meyer-Olkin measure of sampling accuracy (KMO = 0.91) indicated that the data was amenable to factor analysis. Based on the eigenvalues and scree plot, only a single unrotated factor was chosen (henceforth FUF, or First Unrotated Factor), which accounted for 46.43% of the variance, 5.85 times more than the second principal component. Cronbach's alpha for the set of attitudes questions was 0.83. All but two questions loaded on the FUF at at least 0.5. The full list of questions and their loading on the FUF is presented in table 2.

Table 2
Unrotated Attitudes Factor Loadings

Attitudes Questions	FUF
12.The federal government puts tax dollars to good use.	0.80
11.In the West, government institutions act in ways that benefit society overall.	0.80
2.Closely following doctors' recommendations is the best way to stay healthy and overcome disease.	0.78
14.It is in the best interests of developing countries to accept the help offered to them by Western governments and institutions like the World Bank and International Monetary Fund.	0.76
4.When subject-matter experts make appearances on television, they are usually trustworthy.	0.72
6.Scientists put the search for objective truth above other considerations like politics or finding results favourable to those funding the research.	0.71
10.In Western nations, excluding the US, the court systems can be trusted to provide justice for all persons, regardless of personal wealth or connections.	0.71
5.The mainstream media does its best to keep the public informed about the most important issues of the day.	0.65
1.International charity organizations like Amnesty International and the Red Cross have an overall positive impact on the world.	0.64
8.People who dispute the popular scientific consensus are misguided.	0.61
9.People in positions of power got there because of their integrity and job-relevant skills.	0.61
15.In Western nations, on balance, the actions of those with the most wealth and power benefit the middle and working classes.	0.59
3.People are foolish to believe what they are told by government officials.	-0.56
13.What is seen on mainstream television programming is a good representation of the attitudes and beliefs of most of the population.	0.36
7.There is such a thing as a ruling class in Western democratic nations.	-0.28

The beliefs scale was also a suitable candidate for factor analysis, with adequate Bartlett's test of sphericity ($\chi2$ = 15124.63, p < 0.001) and Kaiser-Meyer-Olkin (KMO = 0.93) measure scores. Based on the eigenvalues and scree plot, a first unrotated factor was extracted, as well as a six-factor solution. The first principal component explained 41.14% of the variance, 3.64 times that of the second principal component. An oblimin oblique rotation was used to extract the six-factor model, as it was assumed that the factors would correlate. The first six principal components collectively explained 65.61% of the total variance.

The first five factors each had at least six questions that loaded substantially onto that factor (defined as a loading of 0.5 or greater), while the sixth factor only had three such questions. This suggests the sixth factor is less well-defined than the other factors, possibly being a composite of several undersampled latent factors that did not correlate significantly with the other five well-defined factors. When items cross-loaded onto multiple factors they were assigned to the factor for which the absolute value of the loading was greatest. Two questions that did not load onto any factor at greater than 0.3 were not assigned to a factor (note that they did load at at least 0.45 onto the FUF). The full list of questions along with their loadings on each factor are presented in table 3.

Table 3
Beliefs Factor Loadings

	Factors						
Beliefs Questions	G	AS	FE	J	F	CC	FUF
41.The government perpetrates psychological warfare campaigns on its own citizens.	**0.91**	-0.04	0.04	0.02	-0.08	0.03	0.74
57.The government hires people to spread pro-government propaganda on internet forums.	**0.86**	-0.01	0.05	-0.06	0.01	-0.04	0.65
37.The primary purpose of the media is to manipulate the public for the benefit of the elites.	**0.83**	-0.01	0.01	0.09	-0.08	0.05	0.73
66.Middle Eastern terrorist groups are financed and armed by Western intelligence agencies.	**0.83**	-0.03	-0.03	0.05	0.03	-0.06	0.66
28.The government is constantly collecting surveillance data on its citizens through phone data and internet usage.	**0.72**	0.02	-0.10	-0.02	0.09	-0.13	0.48

46.The government stages false flags in order to start military conflicts.	**0.69**	-0.07	0.04	0.14	-0.15	0.13	0.67
48.Wars do not happen for the reasons given to the general public.	**0.64**	-0.10	0.04	0.16	-0.08	0.23	0.74
63.Economic downturns and depressions are deliberately engineered by central banks.	**0.57**	0.11	0.02	0.08	0.19	0.18	0.82
5.Elections in Western democracies are managed to ensure a particular outcome, or are outright rigged.	**0.56**	0.06	0.02	0.03	0.11	0.25	0.75
31.Public education is meant to produce obedient workers, rather than informed and empowered citizens.	**0.55**	0.03	0.02	0.10	0.00	0.26	0.74
44.The richest people on Earth are left off Forbes' list of the world's richest people.	**0.51**	0.08	-0.01	0.21	0.19	0.06	0.76
39.Global elites seek to create a global digital currency.	**0.49**	0.14	-0.02	0.10	-0.14	0.28	0.65
34.Often both sides of a military conflict are funded by the same parties.	**0.47**	0.09	0.04	0.18	0.23	0.02	0.72
70.Many well known figures who discuss conspiracies or criticize the government are actually working for the government themselves.	**0.46**	-0.03	0.14	0.21	0.25	0.01	0.75
29.Top US officials in government and the military helped plan the September 11 attacks, or otherwise knew about them and did nothing to stop them.	**0.46**	0.19	0.02	0.28	0.14	0.06	0.80
52.The Covid vaccine contains ingredients not disclosed to the public.	**0.46**	0.19	-0.03	0.04	0.03	**0.36**	0.73
13.The government publicizes fake stories of dissidents being punished in order to frighten people into submission.	**0.42**	0.08	0.02	0.00	0.26	0.27	0.72
80.Transsexuality and homosexuality are being deliberately promoted by Western governments.	**0.40**	0.04	0.03	**0.30**	-0.07	**0.38**	0.81

62.IQ tests are not a valid measurement of intelligence.	**0.39**	0.09	**0.36**	**-0.37**	**0.33**	-0.07	0.41
55.Childhood vaccination is the primary factor behind the rise in autism rates.	**0.35**	0.26	0.09	0.02	0.16	**0.31**	0.77
61.Crisis actors are involved in faking terrorist attacks or shootings that are promoted as real events by the media.	**0.34**	0.08	0.13	0.26	0.14	**0.31**	0.88
7.The ostensible leaders of large religious groups, like the Pope or Dalai Lama, don't really believe what they say.	**0.33**	0.13	0.10	0.17	0.24	0.13	0.73
36.New and advanced technology which would harm current industry is being suppressed.	0.29	0.14	-0.27	0.12	0.12	0.23	0.45
84.It is known that aliens exist and this information is being hidden from the public.	-0.04	**0.86**	-0.27	0.07	0.05	-0.12	0.14
77.Global elites are in contact with intelligent, non-human species.	-0.05	**0.79**	0.01	0.04	0.00	0.11	0.37
8.Many members of the global elite are not in fact humans, but another kind of being (e.g. aliens, reptilians, or Nephilim) in human form.	-0.15	**0.77**	0.23	0.00	0.06	0.01	0.34
17.Humans did not build the pyramids.	-0.03	**0.69**	0.12	-0.09	**0.32**	-0.07	0.36
49.Governments possess high tech mind control technology.	0.14	**0.67**	0.06	-0.03	0.05	-0.01	0.40
65.Hollywood elites harvest adrenochrome from children and consume it as a drug.	0.02	**0.64**	0.20	0.10	-0.21	0.29	0.53
71.Many members of the US ruling class worship Satan and participate in Satanic rituals.	0.06	**0.55**	0.19	0.08	-0.22	**0.32**	0.52
3.The US government often assassinates whistleblowers and covers it up.	**0.35**	**0.53**	0.05	0.05	**-0.35**	-0.24	0.19
21.The global elites wish to reduce the world population to 500 million people.	0.29	**0.52**	0.01	-0.02	-0.14	0.19	0.47

Item							
40.We are living in a simulation.	-0.06	**0.49**	0.25	0.06	-0.04	-0.19	0.17
54.Many western elites are involved in extensive child sex trafficking and pedophilia.	0.20	**0.49**	0.00	0.22	**-0.34**	-0.03	0.30
78.Certain public personalities are really simulated people created by CGI and artificial intelligence.	-0.02	**0.47**	**0.40**	0.20	0.01	0.02	0.56
4.The SARS-CoV-2 virus is a bioweapon.	0.04	**0.46**	-0.26	-0.06	**-0.35**	**0.31**	0.04
58.5G technology is a significant health risk to the population.	0.24	**0.45**	0.06	0.01	0.18	0.17	0.63
25.The world is controlled by secret societies like the Illuminati or Skull and Bones.	0.23	**0.45**	0.14	0.06	-0.00	0.26	0.66
32.The government is engaged in atmospheric spraying of aerosolized particles (chemtrails).	0.25	**0.42**	0.10	0.04	0.25	0.25	0.76
53.Dinosaurs lived at the same time as humans.	-0.10	**0.37**	-0.16	-0.06	0.07	**0.37**	0.22
64.The Earth does not orbit the sun.	-0.05	0.10	**0.89**	0.03	-0.16	-0.02	0.41
42.Man-made satellites orbiting the Earth do not exist.	-0.05	0.01	**0.87**	0.02	-0.04	-0.04	0.41
15.The Earth is not a globe.	-0.01	0.11	**0.84**	-0.12	-0.15	0.02	0.35
43.Dinosaurs like tyrannosaurus. stegosaurus, or triceratops never existed.	0.07	-0.04	**0.70**	0.19	0.05	0.01	0.61
16.DNA is not real, or is not responsible for heredity.	0.07	-0.13	**0.65**	-0.02	0.25	-0.02	0.48
60.There is no such thing as pathogenic viruses.	0.03	0.02	**0.59**	0.12	0.22	0.06	0.62
26.Bacteria are a consequence of disease, rather than the cause of it.	0.13	0.02	**0.52**	-0.06	0.19	0.12	0.55
68.The SARS-CoV-2 virus does not exist.	0.07	0.01	**0.43**	0.20	**0.33**	0.14	0.74
76.HIV does not cause AIDS.	0.19	-0.09	**0.41**	0.13	0.26	0.17	0.72
81.Humans have never landed on the moon.	0.14	0.02	**0.39**	**0.33**	**0.31**	-0.01	0.76

83.Most billionaires worldwide are Jews.	0.03	0.03	-0.01	**0.83**	0.08	-0.03	0.70
74.Most famous people have Jewish ancestry.	0.05	0.03	0.01	**0.77**	0.16	-0.05	0.70
73.Jews are vastly over-represented in positions of power and influence around the world.	0.21	0.00	0.02	**0.74**	-0.07	0.02	0.73
75.Much fewer than 6 million Jews died during the Holocaust.	0.04	-0.06	0.10	**0.74**	0.00	0.03	0.66
20.Zionist organizations wield a disproportionate amount of power, compared to other special interest groups.	0.24	0.20	-0.05	**0.68**	-0.04	-0.04	0.71
56.Nazi Germany did not systematically exterminate Jews during World War II.	-0.03	-0.15	0.20	**0.67**	0.14	0.14	0.73
79.There are large differences in personality, intelligence, and behaviour between different races.	-0.08	0.18	-0.04	**0.65**	-0.14	0.13	0.51
35.Miscegenation is being deliberately promoted by Western elites.	0.29	0.08	0.03	**0.31**	0.13	0.21	0.75
82.Hitler died at the end of World War II.	-0.09	-0.08	0.01	-0.14	**-0.56**	-0.19	-0.66
10.Many historical figures have faked their deaths.	0.05	0.09	0.06	**0.31**	**0.55**	0.14	0.76
67.JFK faked his death.	-0.05	-0.18	0.24	**0.31**	**0.54**	0.07	0.62
30.Some historical military battles only happened on paper.	0.28	0.08	0.05	0.23	**0.52**	0.05	0.79
59.JFK was assassinated, but there was more than a single shooter.	0.25	**0.38**	-0.15	-0.25	**-0.50**	-0.05	-0.24
18.Most famous people are closely related to one another.	-0.04	0.09	0.01	**0.41**	**0.50**	0.15	0.70
47.Serial killers do not exist in real life, and any stories about them only happened on paper.	0.06	-0.21	0.24	0.27	**0.49**	0.12	0.66
24.Organized religion is primarily a tool for controlling the population.	0.15	0.11	0.15	0.22	**0.48**	**-0.33**	0.45
69.Nuclear bombs do not and have never existed.	0.02	-0.22	**0.39**	0.23	**0.46**	0.10	0.65

Statement							
23.Fake trials are filmed and broadcast to propagandize the public.	0.30	0.09	0.13	0.24	**0.41**	0.13	0.86
12.Eating GMO foods is hazardous to one's health.	**0.32**	0.26	-0.17	0.01	**0.39**	0.16	0.61
22.No planes flew into the World Trade Center on September 11, 2001.	0.02	0.03	**0.39**	0.13	**0.39**	0.20	0.70
2.All US presidents have been closely related to one another.	0.10	0.06	0.03	**0.33**	**0.38**	0.15	0.69
19.China, Russia, and America are controlled by the same parties behind the scenes.	0.25	0.07	0.16	0.28	**0.34**	0.08	0.79
85.Black holes, as commonly portrayed in pop-science media, do not exist.	0.12	-0.12	0.26	0.17	**0.33**	0.26	0.69
9.Shakespeare personally wrote all the works commonly attributed to him.	**-0.31**	0.06	-0.11	-0.01	**-0.32**	0.11	-0.40
51.Carbon dioxide is not a real threat to the environment.	0.21	-0.09	0.03	0.16	0.06	**0.62**	0.74
27.Human activity has little to no effect on the global temperature over time.	0.22	-0.05	0.10	0.10	0.05	**0.58**	0.73
6.The theory of anthropogenic global warming was invented in order to control people.	0.27	0.05	0.05	0.17	0.06	**0.53**	0.81
45.High levels of immigration into Western countries is meant to weaken those countries.	0.29	0.04	0.06	**0.30**	-0.06	**0.47**	0.82
11.The COVID pandemic was planned in advance.	0.25	0.19	-0.02	0.16	0.20	**0.46**	0.83
33.Man did not evolve from apes.	0.03	0.24	0.30	-0.05	0.16	**0.46**	0.65
50.Vaccines are not responsible for the historical decline in mortality from diseases like measles and polio.	0.15	0.03	0.19	-0.03	0.27	**0.41**	0.66
14.The Earth is much younger than 4.54 billion years old.	0.07	0.08	**0.40**	-0.14	0.10	**0.41**	0.55
38.Jesus was a real historical person.	-0.12	0.27	-0.26	-0.26	-0.12	**0.38**	-0.14

| 1.Vegan and plant-based diets are being deliberately promoted by world governments despite their harmful effects. | 0.18 | 0.15 | 0.03 | 0.22 | -0.07 | **0.32** | 0.58 |
| 72.Water is fluoridated for reasons that have nothing to do with dental health. | 0.29 | 0.20 | 0.08 | 0.24 | 0.18 | 0.30 | 0.86 |

Each of first five factors represented distinct, epistemologically consistent constellations of conspiracist ideation. The first factor, "Generic Conspiracy", ($\alpha = 0.96$) contained 22 items on a variety of nonspecific conspiracies. The second factor, "Aliens & Satanism", ($\alpha = 0.93$) contained 17 items concerning topics like the existence of aliens and alleged Satanic practices of the elite. The third factor, "Flat Earth and Terrain Theory", ($\alpha = 0.93$) contained 10 items concerning astronomy relevant to the shape of the Earth, as well as questions about viruses and bacteria and their role in disease. The fourth factor "Jewish Conspiracy", ($\alpha = 0.93$) contained 8 items concerning the representation of Jews in positions of power. The fifth factor, "Fakery", ($\alpha = 0.85$) contained 16 items relating to hoaxes, faked historical events, and faked deaths. The sixth factor, "Climate Change", ($\alpha = 0.89$) contained 10 questions pertaining to the theory of anthropogenic global warming and other miscellaneous topics.

The extracted factors correlated moderately to strongly with one another, as well as with the overall scale scores for the attitudes and beliefs scales. The exception was the Aliens and Satanism factor, which correlated only weakly with the Jewish Conspiracy, Fakery, and Flat Earth factors. The correlations between each factor and the full scale scores are presented in table 4.

Table 4
Correlations Between Beliefs Factors and Full Scale Scores

	G	AS	FE	J	F	CC	Bel	Att
G	1.0	0.57	0.57	0.74	0.69	0.84	0.93	0.86
AS		1.0	0.27	0.36	0.2	0.59	0.65	0.47
FE			1.0	0.6	0.77	0.58	0.75	0.49
J				1.0	0.75	0.66	0.83	0.64
F					1.0	0.64	0.82	0.59
CC						1.0	0.88	0.75
Bel							1.0	0.8
Att								1.0

N = 176. All correlations significant at p < 0.001. G = Generic Conspiracy, AS = Aliens & Satanism, FE = Flat Earth & Terrain Theory, J = Jewish Conspiracy, F = Fakery, CC = Climate Change, Bel = Beliefs scale score, Att = Attitudes scale score.

In order to visualize how different varieties of conspiracist beliefs clustered together, Uniform Manifold Approximation and Projection or UMAP (McInnes et al., 2018) was used to reduce the 85-dimensional beliefs scale to two dimensions. This dimensionality reduction technique was deemed more suitable than PCA as it is better at preserving distances between nearby points and hence finding clusters (Sánchez-Rico and Alvarado, 2020). Note that, unlike PCA, UMAP is a non-linear dimensionality reduction technique, and so the dimensions of the 2D projection have no inherent meaning. Consequently, they are left unlabeled, and the diagrams are intended to visualize the relevant clusters of beliefs. The 2D embeddings, variously labeled by self-reported identity or scores on full scales and individual factors, are presented in Figure 3. Scores are represented by a colour spectrum ranging from red (the maximum respondent score on that factor) to blue (the minimum respondent score on that factor). In this way, it can be observed how each factor clusters in conspiracy-belief space relative to the other factors.

Figure 3
UMAP Embeddings of Identity and Factor Scores

Respondent Identities

- No Data
- Unsure
- Truthers
- Non-Truthers

Attitudes score

- High Score
- Low Score

Beliefs score

Generic Conspiracy score

Aliens & Satanism score

Flat Earth & Terrain Theory score

Jewish Conspiracy score

Fakery score

Climate Change score
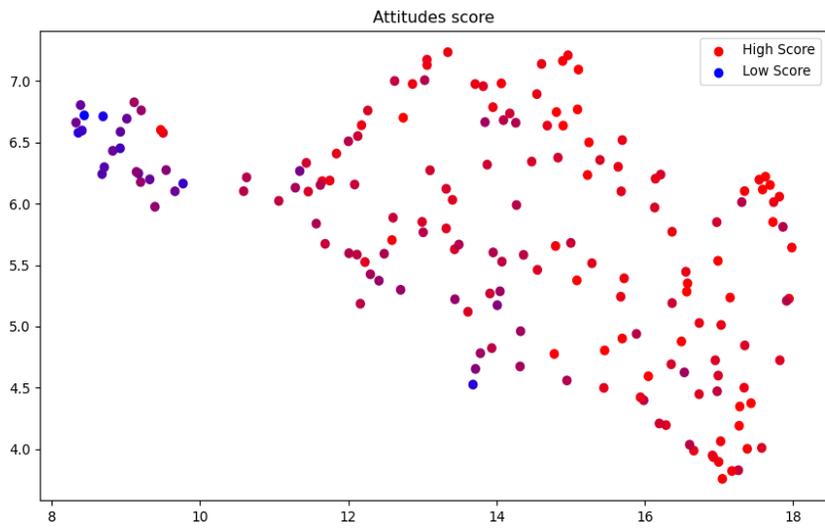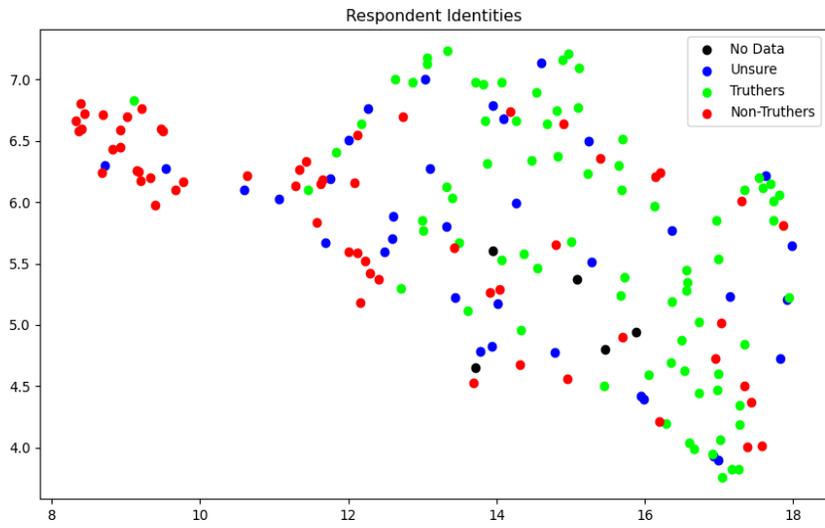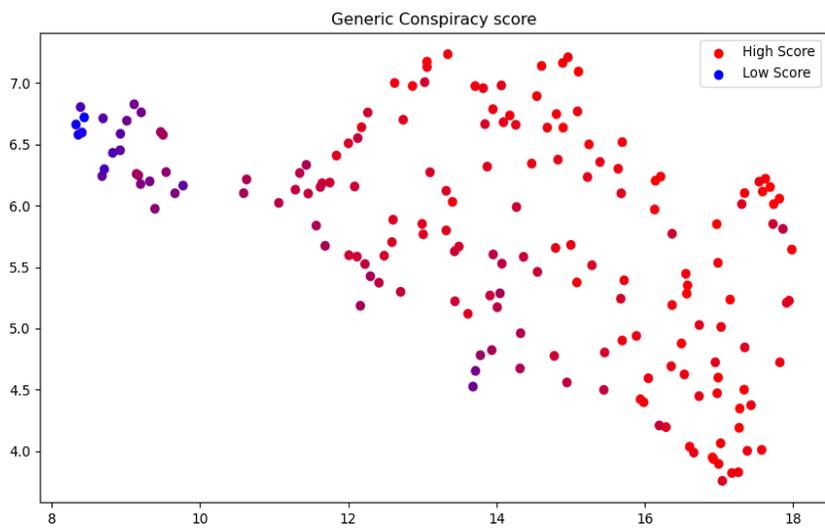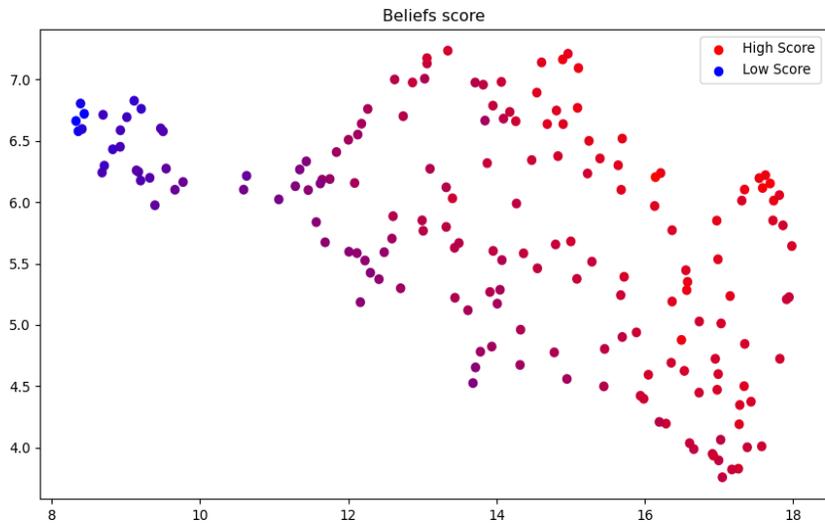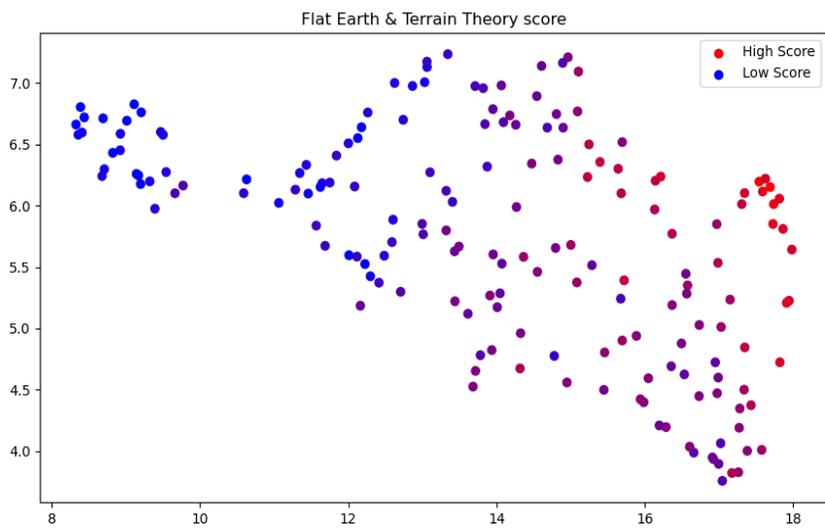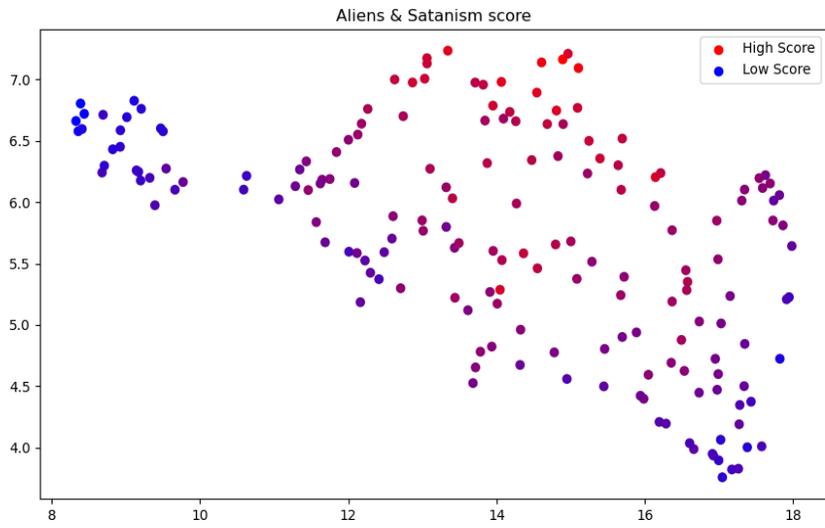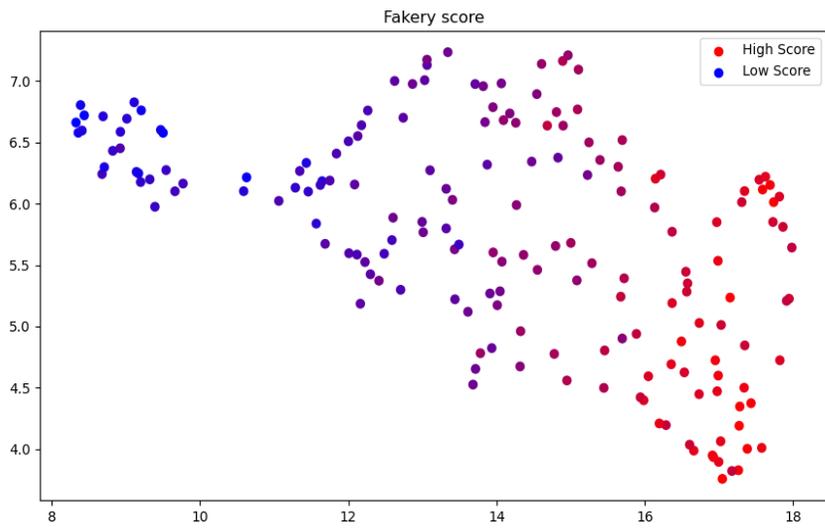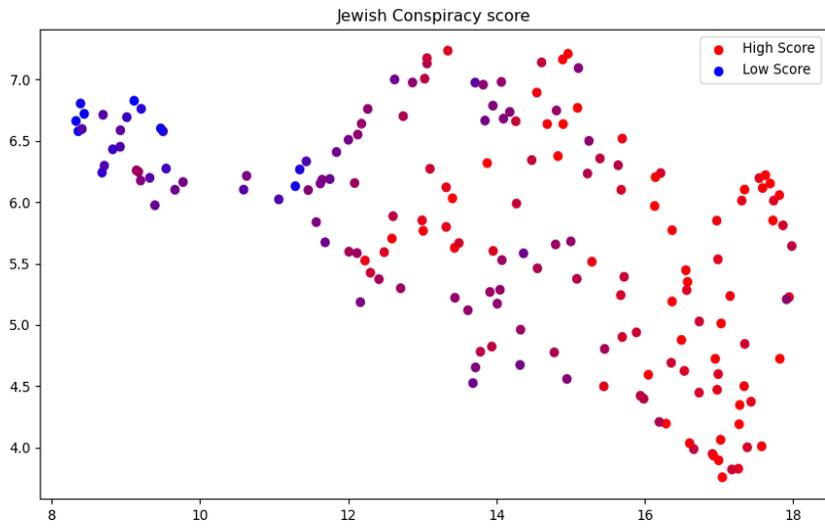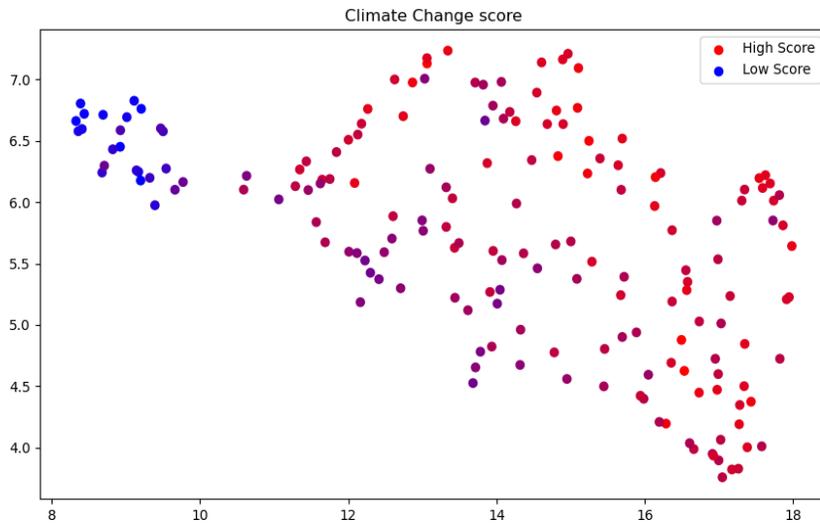
It was observed in several of the scatter plots graphing scores on two factors that correlation was high, but almost all points were found either above or below the bottom-left to top-right diagonal. For instance, looking at the graph of the Flat Earth and Generic Conspiracy scores, we can see that the vast majority of scores are below the diagonal. This implies that all respondents that scored highly on the Flat Earth factor also scored at least as highly on the Generic Conspiracy factor. The simple correlation of 0.57 between the two factors does not adequately capture this relationship.

In order to quantify this relationship, a new measure was developed. First, the scatter plot was normalized to fall in the unit square, such that the diagonal ran from (0, 0) to (1, 1) with slope 1. Then, for every point p on the scatter plot the intersection with the y-axis of a line with slope 1 passing through that point was calculated. The y-intersections could then be plotted on a histogram. One example is shown in Figure 4; the remaining plots are included in the supplemental materials.

Figure 4
Scatter Plot of Generic Conspiracy and Flat Earth Factor Scores with Computed Histogram
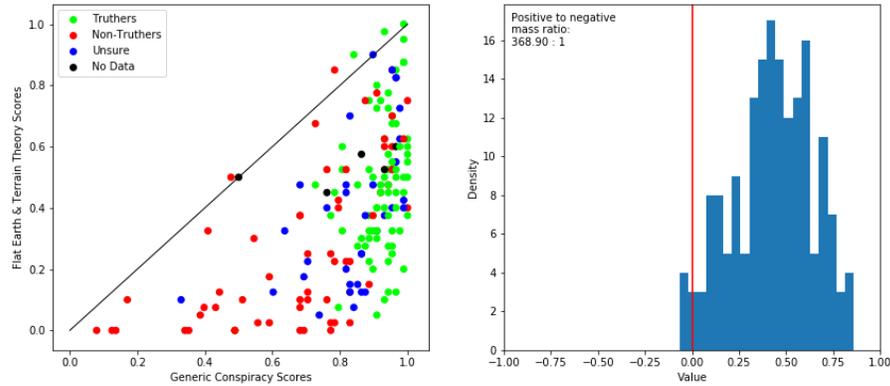
The mass on either side of zero was calculated by summing the absolute value of all positive and all negative values. When a substantial majority of this mass was located on one side (here defined as at least 75%) this was interpreted as one variable having a limiting effect on the other. In the case of the Flat Earth and Generic scores, all respondents who score highly on the Flat Earth factor also score at least as high on the Generic factor, however those who score highly on the Generic factor may have any score on the flat Earth factor. In other words, $A \geq B$.

When this measure was applied to all factors with a correlation of at least $r = 0.5$ (the correlation between two variables when points are distributed uniformly above the diagonal) a partial ordering emerges demonstrating two divergent streams of conspiracist ideation, shown in Figure 5.

Figure 5
Conspiracist Beliefs Partial Ordering
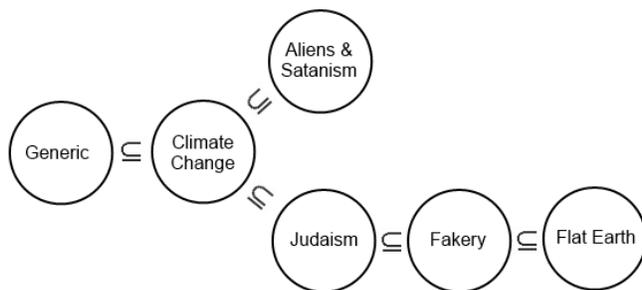
Based on this analysis, all those who score highly on the Flat Earth factor also score highly on the Fakery, Jewish Conspiracy, Climate Change, and Generic Conspiracy factors, and those who score highly on the Aliens factor also score highly on the Climate Change and Generic factors. There is however only a weak correlation between the two streams. Note that this does not imply that one who

scores highly on the Jewish Conspiracy factor must eventually progress to holding the beliefs represented by the Flat Earth factor. Nor does it imply that one who scores highly on the Flat Earth factor must have developed those beliefs subsequent to holding beliefs about Jews and then holding beliefs about hoaxed events. Rather, beliefs that load onto Fakery may be considered a more radical subset of beliefs that load onto the Jewish Conspiracy factor, while beliefs that load onto Flat Earth are a more radical subset of Fakery beliefs. These beliefs may also have different epistemological bases, as will be discussed subsequently.

Extracted Factors

The first factor identified by the factor analysis has been labeled the "Generic Conspiracy" factor, as the questions relate to general ways in which conspiracies influence world events, e.g. "*Economic downturns and depressions are deliberately engineered by central banks*" and "*The government stages false flags in order to start military conflicts*" The questions loading on this factor only mention one specific event, 9/11, in the question "*Top US officials in government and the military helped plan the September 11 attacks, or otherwise knew about them and did nothing to stop them*" This question also correlates most highly with self-reported identity (r = 0.56, p < 0.001). The term "truther" emerged as a result of the 9/11 truth movement (Leibovich, 2015), so this correlation is apropos, given that the identity question was asked as "*Do you self-identify as a conspiracy theorist or truther?*" The top 5 questions that correlate most highly with self-reported identity (r > 0.5, p < 0.001 for all questions) all load onto this first factor.

The second factor identified was the factor labeled "Aliens & Satanism". Subfactor analysis demonstrated that this factor was composed of two highly correlated subfactors: an "Aliens" subfactor and a "Satanism" subfactor. Taking four questions related to aliens and three questions related to Satanism as groups, it was found that these groups correlated with each other at r = 0.61, and each correlated with the overall "Aliens" factor at r = 0.84 (p < 0.001 for all correlations). Furthermore, the pairwise correlations between each question was at minimum 0.53 (average 0.71) in the Aliens group and 0.62 (average 0.79) in the Satanism group. Although these subgroups correlated strongly, many more respondents strongly endorsed the Satanism questions compared to the aliens questions. Embeddings visualizing scores on each question group are shown in Figure 6.

Aliens questions
"*It is known that aliens exist and this information is being hidden from the public*"

| "*Many members of the global elite are not in fact humans, but another kind of being (e.g. aliens, reptilians, or Nephilim) in human form*" |
| --- |
| "*Humans did not build the pyramids*" |
| "*Global elites are in contact with intelligent, non-human species*" |
| **Satanism questions** |
| "*Many members of the US ruling class worship Satan and participate in Satanic rituals*" |
| "*Hollywood elites harvest adrenochrome from children and consume it as a drug*" |
| "*Many western elites are involved in extensive child sex trafficking and pedophilia*" |

Figure 6
t-SNE of Aliens and Satanism Question Group Scores

Satanism group score
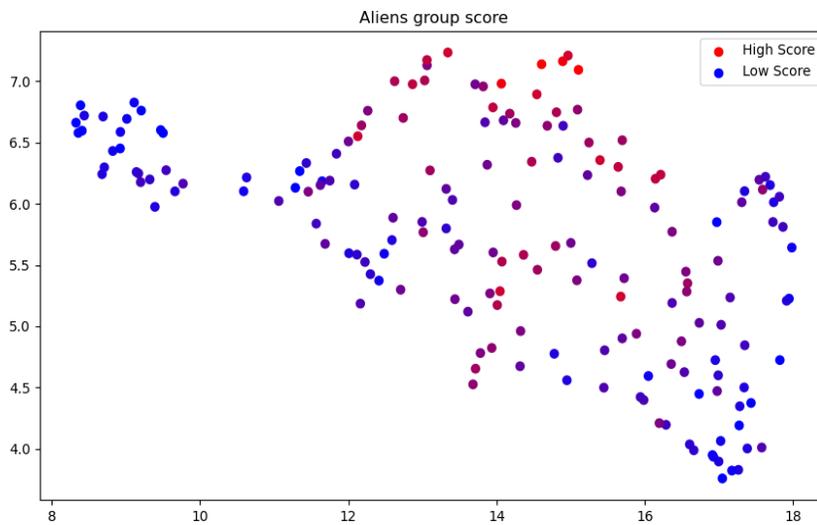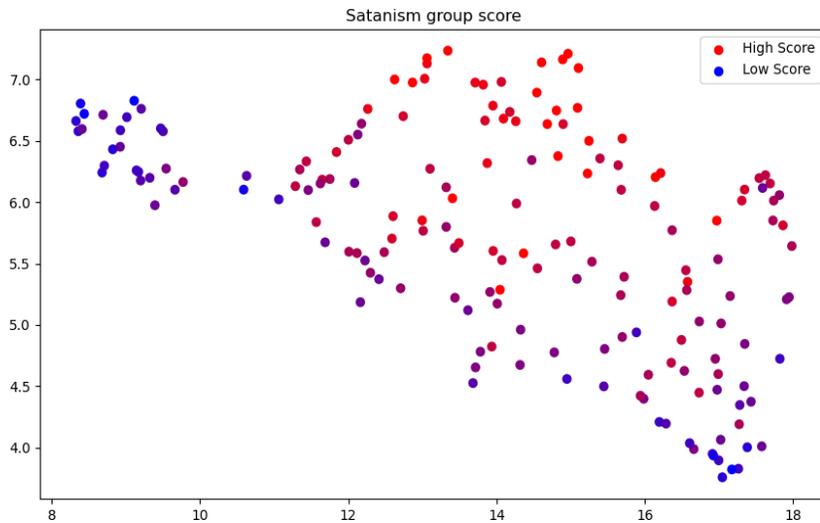
The third factor identified was the factor labeled "Flat Earth & Terrain Theory". Subfactor analysis demonstrated that this factor was composed of two highly correlated subfactors: a "Flat Earth" subfactor and a "Terrain Theory" subfactor. Terrain theory, a form of germ theory denial, originates from the scientific rivalry between Antoine Béchamp and Louis Pasteur in the late 20th century. It holds that the conditions of the body are responsible for disease, and that while the presence of microbes may coincide with disease states, they are a consequence rather than a cause of those states. Terrain theory has seen a surge in popularity following the events surrounding COVID-19 (Benjamin, 2021). Taking three questions related to flat Earth and four questions related to terrain theory as groups, it was found that they correlated with each other at 0.56, and each correlated with the overall "Flat Earth" factor at $r = 0.8$ ($p < 0.001$ for all correlations). Furthermore, the pairwise correlations between each question was at minimum 0.72 (average 0.84) in the flat Earth group and 0.58 (average 0.76) in the terrain theory group. Although these subgroups correlated strongly, many more respondents strongly endorsed the terrain theory questions compared to the flat Earth questions. Embeddings visualizing scores on each question group are shown in Figure 7.

Flat Earth questions
"*The Earth is not a globe*"
"*The Earth does not orbit the sun*"

| |
|---|
| *"Man-made satellites orbiting the Earth do not exist"* |
| **Terrain Theory questions** |
| *"There is no such thing as pathogenic viruses"* |
| *"The SARS-CoV-2 virus does not exist"* |
| *"HIV does not cause AIDS"* |
| *"Bacteria are a consequence of disease, rather than the cause of it"* |

Figure 7
t-SNE of Flat Earth and Terrain Theory Question Group Scores

Terrain Theory group score
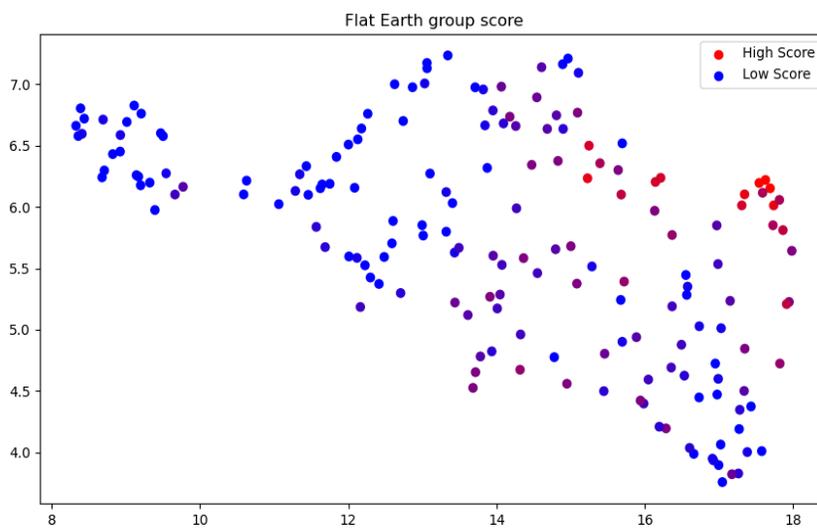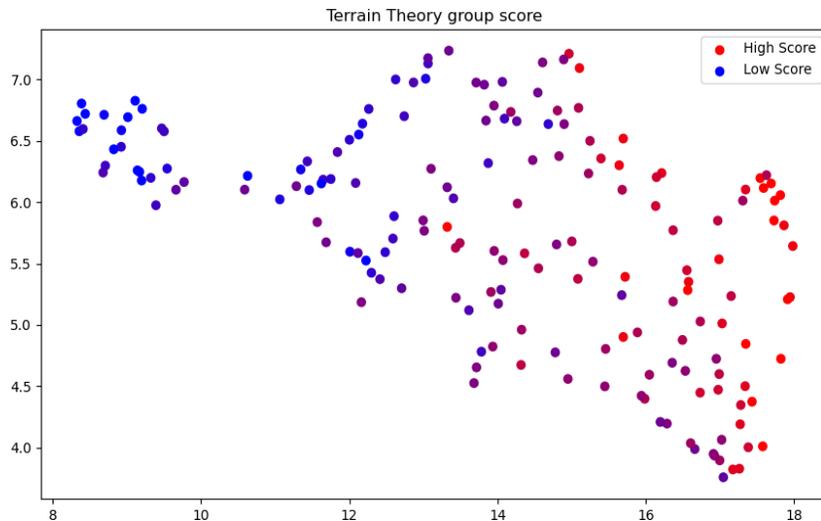
The fourth factor identified was the factor labeled "Jewish Conspiracy", as the first 6 questions with the strongest loadings on this factor were about Jews in some way. The remaining two questions that were given to this factor also addressed issues of race, namely race differences in intelligence and behaviour, and elite promotion of miscegenation. Interestingly, this was the only factor on which the question "IQ tests are not a valid measure of intelligence" loaded significantly and negatively. The other three factors where this question loaded at > 0.3 (Generic Conspiracy, Flat Earth & Terrain Theory, and Fakery) all had positive loadings on this question.

The fifth factor identified was the factor labeled "Fakery". The questions that loaded onto this factor concerned hoaxes and faked deaths, for instance "Many historical figures have faked their deaths" or "Nuclear bombs do not and have never existed".

The final factor identified was the factor labeled "Climate Change". The first three questions that load most strongly onto this factor all deal with the theory of anthropogenic global warming, and correlate with each other at a minimum of 0.71 (0.83 average). These three questions alone correlate at 0.93 with the overall factor. There are also three questions that appear to be related to Young Earth Creationism on this factor. A fourth question in this vein, "*Dinosaurs lived at the same time as humans*", loads onto this factor at 0.37 but was given to the Aliens factor due to loading marginally higher there. Breaking this factor down into two subfactors yields one factor where the three Young Earth Creationism questions load highest (with "Man did not evolve from apes" loading at 0.99 and the next highest loading at 0.33) and all other questions loading on the other factor.

Climate Change questions

| |
|---|
| *"The theory of anthropogenic global warming was invented in order to control people"* |
| *"Human activity has little to no effect on the global temperature over time"* |
| *"Carbon dioxide is not a real threat to the environment"* |
| **Young Earth Creationism questions** |
| *"The Earth is much younger than 4.54 billion years old"* |
| *"Man did not evolve from apes"* |
| *"Jesus was a real historical person"* |

The scores on each of these six factors, broken down by self-reported identity, are shown in Figure 8.

Figure 8

*Histogram of Beliefs Factor Scores by Identity*
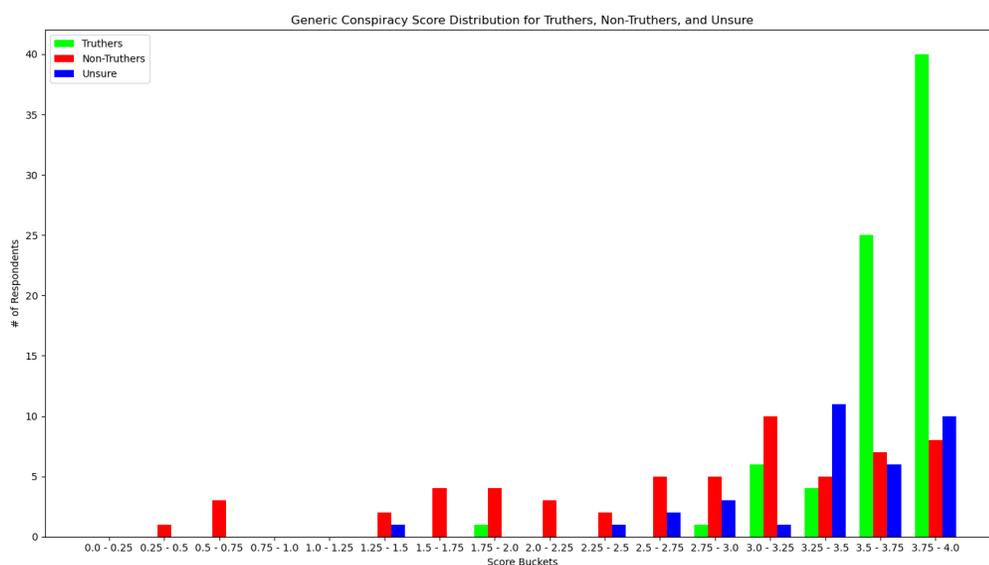
Climate Change Score Distribution for Truthers, Non-Truthers, and Unsure
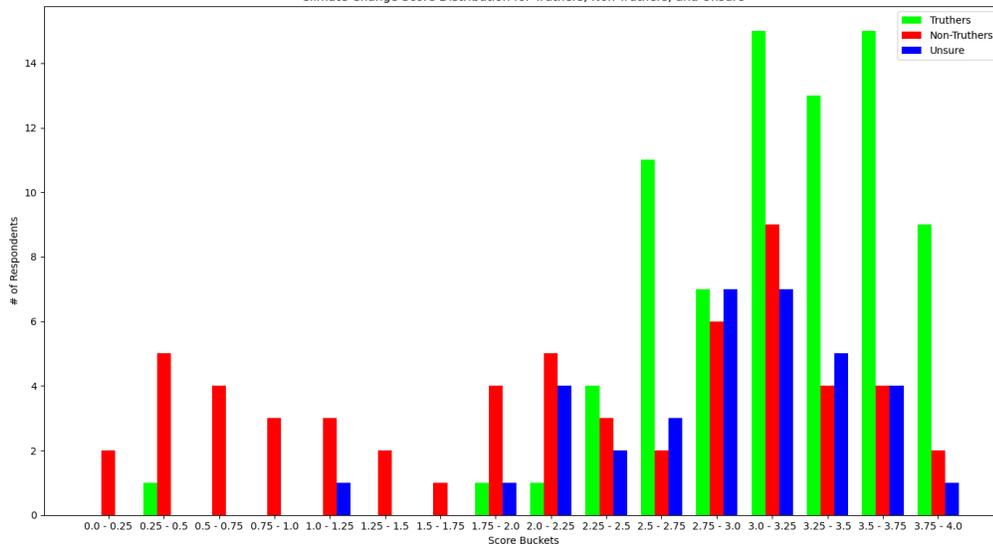
Aliens & Satanism Score Distribution for Truthers, Non-Truthers, and Unsure
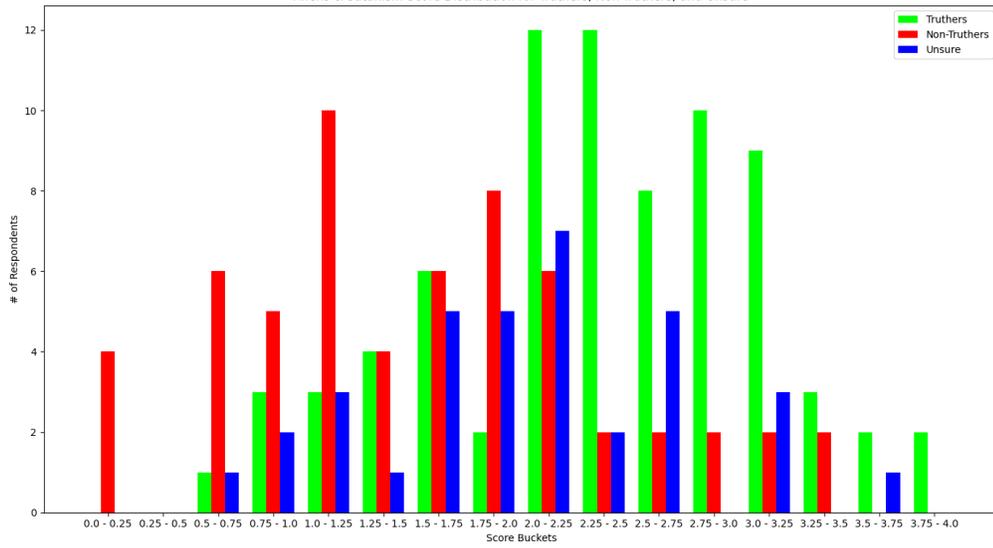
Jewish Conspiracy Score Distribution for Truthers, Non-Truthers, and Unsure

Fakery Score Distribution for Truthers, Non-Truthers, and Unsure
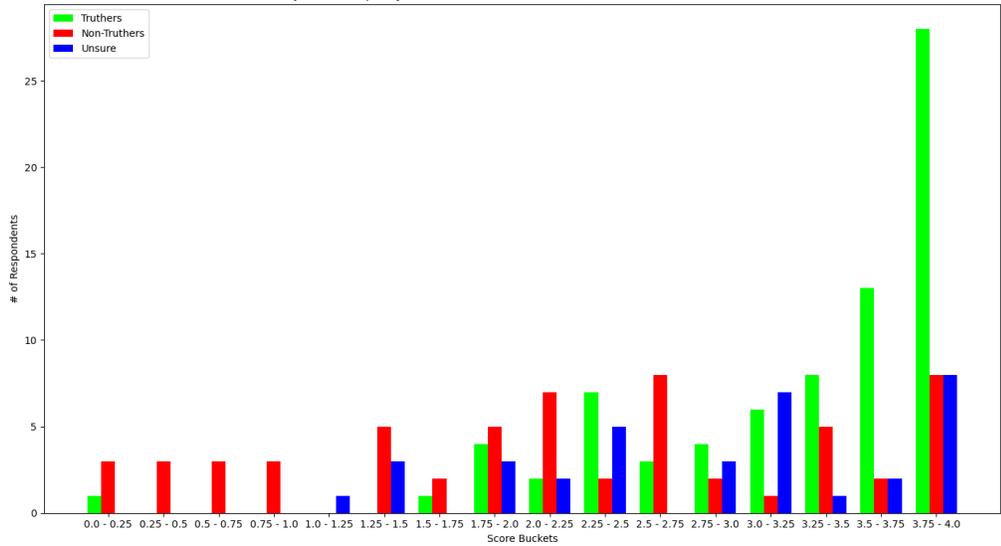
Flat Earth & Terrain Theory Score Distribution for Truthers, Non-Truthers, and Unsure
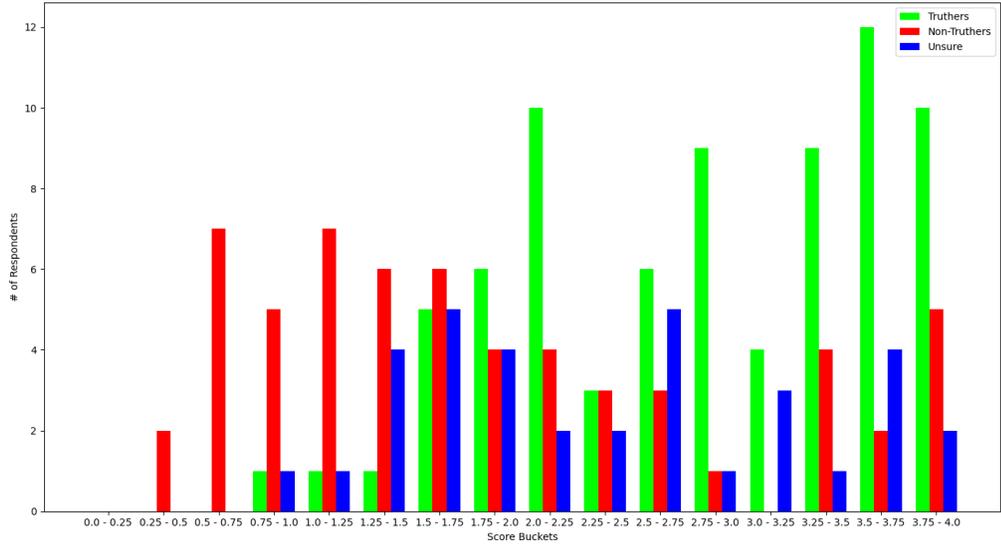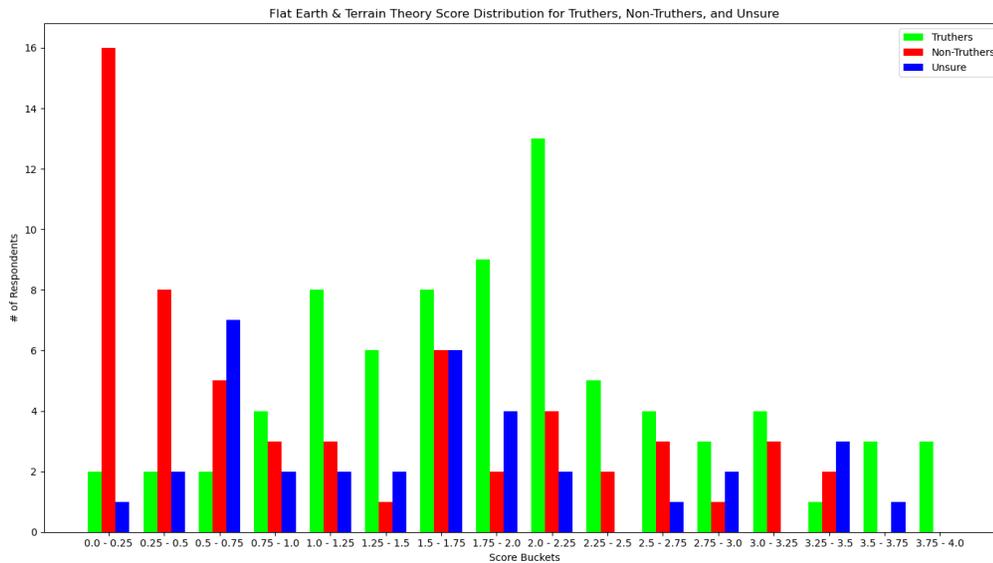
Discussion

Based on this data, it seems there are two distinct paths to high levels of belief in conspiracies. The first is in the direction of belief in aliens and satanism, and the second follows a path of increasing divergence from mainstream thought in the direction of, first, conspiracies involving Jews, then conspiracies involving faked deaths and events, then conspiracies involving fundamental scientific world models. It is likely that these two paths have different epistemological origins.

Both paths begin with high endorsed belief in the "Generic Conspiracy" and "Climate Change" conspiracies. These factors are highly correlated (r = 0.84). The "Generic Conspiracy" factor asks general questions, like whether government perpetrate psychological warfare on their citizens, while the "Climate Change" factor asks questions related to specific events and policies (e.g. was the theory of global warming invented to control the population, was the COVID pandemic planned in advance, are high levels of immigration intended to weaken countries, etc.)

The first path is the set of beliefs associated with high scores on the Generic Conspiracy, Climate Change, and Aliens & Satanism factors. The Aliens & Satanism factor generally includes questions involving topics that are exotic (belief in aliens) or salacious (elites engage in Satanic rituals and harvest adrenochrome from children). All questions involving belief in the paranormal load onto this factor. This factor also correlates the least with the other factors, suggesting that it is a distinct variety

of conspiracist belief, likely underpinned by different psychological factors from the others. Belief in the paranormal has been shown to correlate moderately with conspiracist beliefs (Lobato 2014). Further research should investigate whether this correlation is mediated by high scores on this factor of conspiracist belief.

The second path is the set of beliefs associated with high scores on the Generic Conspiracy, Climate Change, and Jewish Conspiracy factors. The Jewish factor encompasses beliefs about Jews, as well as beliefs about race. All questions involving Jews are highly intercorrelated, suggesting that those who believe that Jews as a group wield disproportionate power are also less likely to accept the conventional Holocaust narrative. Related to beliefs about Jews as a race are beliefs that races differ substantially in cognitive and behavioural traits, and that interracial marriage is being deliberately promoted.

Some respondents who score highly on the Jewish Conspiracy factor also score highly on the Fakery factor. This factor represents a radical skepticism about the veracity of historical events and narratives, with those who score highly on this factor believing that many historical events were in fact faked or manufactured. It also represents opposition to commonly held conspiracy narratives; whereas the most prevalent conspiracy theory about the JFK assassination is that there were multiple shooters or that the shooters acted with backing from groups like the CIA, those who score highly on this factor believe JFK's death was a hoax.

Some who score highly on the Fakery factor also score highly on the Flat Earth factor. This factor extends the historical skepticism of the fakery factor to skepticism of fundamental scientific models. Both flat Earthism and terrain theory involve rejecting a scientific model that is based on inference from data to conclusions that cannot be directly observed. The shape of the Earth cannot be directly observed: it must be inferred from things like the Earth's shadow during eclipses, the way constellations change based on time and latitude, or satellite data. Similarly, viruses cannot be observed directly: their existence must be inferred based on electron micrographs, serum antigens, or cytopathic effects in cells exposed to viral cultures (Burrell et al. 2017). Similar arguments can be made about the questions "*Dinosaurs like tyrannosaurus. stegosaurus, or triceratops never existed*" and "*DNA is not real, or is not responsible for heredity*" which also load on this factor.

Some of the differences between the various factors are highlighted by the factor loading patterns of several questions, which load positively on one factor and negatively on another above the 0.3 loading magnitude threshold. These questions are *"IQ tests are not a valid measurement of intelligence.", "The US government often assassinates whistleblowers and covers it up. ", "Many western elites are involved in extensive child sex trafficking and pedophilia.", "The SARS-CoV-2 virus is a bioweapon.",* and *"JFK was assassinated, but there was more than a single shooter."* For the IQ question, the only factor where it loads significantly and negatively (i.e. expresses belief in the validity of IQ tests) is the

Jewish Conspiracy factor. The other factors where it loads significantly (Generic Conspiracy, Flat Earth, and Fakery) have positive loadings. This suggest that truthers are in general skeptical of IQ tests, except perhaps for a group that has come to conspiratorial beliefs about Jews via studying the evolutionary psychology and psychometrics literature on the topic. The next four questions, pertaining to government assassinations, pedophilia, SARS-CoV-2, and the JFK assassination are all similar in that they load positively on the Aliens and Satanism factor and negatively on the Fakery factor. This represents a significant divergence in the character of the conspiracist beliefs represented by these two factors, which is also reflected by the lower correlation (r = 0.20) between them. Whereas the conspiratorial belief endorsed by the Aliens and Satanism factor is the JFK was assassinated by multiple shooters, the Fakery factor endorses that the entire assassination was faked. Similarly while the Aliens and Satanism factor endorses that SARS-CoV-2 is a bioweapon, the Fakery factor endorses that it does not exist.

Conclusion

Conspiracist beliefs have been said to emerge from a variety of sources: low tolerance for uncertainty (Marchlewska et al. 2018), a psychological need to feel unique (Lantian et al. 2017), or biased information processing (McKernan et al. 2023). While these reasons may be sufficient to explain conspiracist beliefs in some cases, the present study indicates that a lack of trust in mainstream institutions and authority figures may be sufficient to justify belief in conspiracies.

This study also demonstrates that conspiracist beliefs are far more varied than has heretofore been described in the psychological literature. This finding was made possible by the targeted sampling of those expressing high degrees of conspiracist belief, and the results of this study suggest that this is a requirement for studying the breadth of conspiracist ideation as it exists today. Certain conspiracist beliefs are less common than others, and representative samples of the general population will not provide a sufficient sample size for certain beliefs, e.g. flat Earth beliefs.

Future research should investigate the psychological and epistemological underpinnings of the subtypes of conspiracist belief described herein. It remains an open question as to whether the previously identified predictors of conspiracist belief vary in a statistically significant way with the belief subtype espoused. It should also be determined whether these findings replicate in representative samples.

Citations:

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