Supplementary Material

Supplementary methods

Experimental stimuli

Social media posts with sacred (vs. non-sacred) values were combined with similar number of likes (M_{diff} = 2.50, 95% CI [-12.6, 17.6], t(14) = 0.35, p = .73), number of retweets (M_{diff} = -21.5, 95% CI [-120, 76.6], t(14) = -0.47, p = .64) and gender of the leaders tweeting the posts (the same 3 female and 4 male leaders tweeted the posts in each condition). The selection of leaders was different for each sample so that each voters' group had their own set of 7 ingroup leaders (center-right leaders, far-right leaders, and pro-Trump leaders). Nonetheless, all sets of leaders tweeted the exact same content (center-right and far-right leaders) or American adapted content (pro-Trump leaders). Items in the sacred and non-sacred value conditions were also matched for character length in the Spanish version for Study 1 (M_{diff} = -1.69, 95% CI [-3.78, 0.40], t(30) = -1.65, p = .11), in the English version for Study 2 (M_{diff} = 2.44, 95% CI [-7.33, 12.2], t(30) = 0.51, p = .61) and in a shorter Spanish version adapted for the neuroimaging study (M_{diff} = 0.75, 95% CI [-1.31, 2.81], t(30) = 0.74, p = .46).

To control for the effect of potential confounds associated with sacred values in each of the social media posts, we ran a third pilot study on a sample of 80 US conservatives who were pre-screened using the same criteria as the US study participants (having voted for Trump in the two previous US presidential elections in 2016 and 2020). For each of the 32 social media posts employed in the US study, we obtained ratings of perceived accuracy ("To the best of your knowledge, is the claim in the above social media post accurate?" from 1 = "Very inaccurate" to 5 = "Very accurate"), certainty ("I feel very certain about my feelings toward this issue"), extremity ("I feel strongly about this issue"), importance ("This issue is personally important to me"), familiarity ("I am quite familiar with this issue"), and salience ("I spend a lot of time thinking about this issue") on a 5-point Likert scale from "Strongly disagree" to "Strongly agree". Certainty, extremity, and importance scores were combined into an attitude strength composite score (α =

0.87). Social media posts relevant to sacred (vs. non-sacred) values received similar ratings in perceived accuracy (sacred values: M = 3.28, SD = 0.69; non-sacred values: M = 3.14, SD = 0.66; M_{diff} = 0.14, 95% CI [-0.01, 0.29], t(72) = 1.80, p = .076, Cohen's d = 0.21, 95% CI [-0.12, 0.53], see Fig. 1g), but were rated higher in attitude strength (sacred values: M = 3.59, SD = 0.77; non-sacred values: M = 2.45, SD = 0.80; M_{diff} = 1.14, 95% CI [0.95, 1.34], t(72) = 11.72, p < .001, d = 1.46, 95% CI [1.09, 1.82]), familiarity (sacred values: M = 3.25, SD = 0.88; non-sacred values: M = 2.17, SD = 0.96; M_{diff} = 1.09, 95% CI [0.89, 1.28], t(72) = 11.09, p < .001, d = 1.18, 95% CI [0.83, 1.54]), and salience (sacred values: M = 2.60, SD = 0.97; non-sacred values: M = 1.86, SD = 0.80; M_{diff} = 0.74, 95% CI [0.57, 0.91], t(72) = 8.60, p < .001, d = 0.83, 95% CI [0.49, 1.17]).

Additional measures

Scientific curiosity. Scientific curiosity was assessed by means of three items extracted from the stretching subscale of the Science Curiosity in Learning Environments scale (Weible & Zimmerman, 2016), including "I try to learn as much as I can in new situations", "I see a challenge as a way to grow and learn", and "I apply new information to an existing problem to see if that helps". Participants responded using a five-point Likert scale from 1 "Not at all like me" to 5 "Very much like me". The three items were averaged into a Scientific curiosity score (α = .77) with values ranging from 1.33 and 5 (M = 4.07, SD = 0.67).

Intellectual humility. Intellectual humility was evaluated with the 6-item open mindedness subscale of Alfano et al. (Alfano et al., 2017) intellectual humility scale. This subscale includes items such as "I think that paying attention to people who disagree with me is a waste of time." and "I feel no shame learning from someone who knows more than me.". The 5-point response scale ranged from 1 "Not at all like me" to 5 "Very much like me". The six items were averaged into an Intellectual humility score (α = .67) with values ranging from 2.17 and 5 (M = 1.12, SD = 0.60).

Media literacy. Media literacy was measured by means of three items of the Media literacy education scale by Simons and Meeus (Simons & Meeus, 2017), including "I know that media represents information in a selective way and know how to interpret media messages" and "I can evaluate media

content taking into account various criteria (e.g. accuracy of information, comparison of information, appreciation of aesthetic aspects)", using a five-point Likert scale from 1 "Not at all like me" to 5 "Very much like me". The three items were averaged into a Media literacy score (α = .70) with values ranging from 1 and 5 (M = 3.74, SD = 0.76).

Supplementary results

Moral-emotional language

All 16 false statements employed (8 sacred values and 8 non-sacred values) were formulated twice, once using moral-emotional language and once using neutral language. There were some cross-cultural differences in the effect of moral-emotional language on likelihood of sharing in the US and Spanish surveys. While using moral-emotional language had a small effect across the whole sample in Spain (moral-emotional language: M = 4.13, SD = 1.61; neutral language: M = 4.03, SD = 1.60; M_{diff} = 0.10, 95% [0.05, 0.14], t(811) = 5.07, p < .001, d = 0.08, 95% CI [-0.02, 0.17]), only respondents who were fused with Trump were responsive to language in the US sample (moral-emotional language: M = 3.62, SD = 1.60; neutral language: M = 3.46, SD = 1.53; M_{diff} = 0.16, 95% [0.03, 0.29], t(795) = 2.48, p = .013, d = 0.10, 95% CI [-0.15, 0.36]) as compared to those who weren't fused with Trump (moral-emotional language: M = 2.62, SD = 1.39; neutral language: M = 2.67, SD = 1.32; M_{diff} = -0.05, 95% [-0.10, 0.01], t(795) = -1.66, p = .10, d = -0.03, 95% CI [-0.14, 0.07]). No such interaction was found in Spanish conservatives (p = .16). Thus, support for our pre-registered hypothesis on moral-emotional language was mixed.

We also found mixed evidence for our prediction that non-sacred values would be more susceptible to moral-emotional language effects as compared to sacred values. In the Spanish sample, moral-emotional language was associated with increased likelihood of sharing posts on non-sacred values (moral-emotional language: M = 3.87, SD = 1.38; neutral language: M = 3.74, SD = 1.29; M_{diff} = 0.14, 95% [0.07, 0.20], z-score = 4.18, p < .001, d = 0.10, 95% CI [0.004, 0.20]), but did not affect posts on sacred values (moral-emotional language: M = 4.38, SD = 1.40; neutral language: M = 4.32, SD = 1.39; M_{diff} = 0.06, 95% [-0.001,

0.13], z-score = 1.92, p = .054, d = 0.04, 95% CI [-0.05, 0.14]). However, these differences were not detected in the US sample (ps > .47).

Media literacy, humility, and curiosity

Individuals with higher media literacy scores were more likely to share misinformation related to sacred compared to non-sacred values as compared to those with lower media literacy scores in the Spanish sample (high media literacy: M_{diff} = 0.74, 95% [0.63, 0.84], t(810) = -13.26, p < .001, d = 0.48, 95% CI [0.13, 0.83]; low media literacy: M_{diff} = 0.12, 95% [-0.08, 0.33], t(810) = 1.13, p = .26, d = 0.60, 95% CI [-3.80, 5.00]). In the US sample, media literacy did not significantly moderate participants' likelihood of sharing sacred compared to non-sacred values (p = 0.14).

In the Spanish sample, individuals with higher humility scores were less likely to share misinformation (B = -0.15, 95% [-0.30, -0.00], t(980) = -1.98, p = .047) but more likely to share misinformation related to sacred vs. non-sacred values (M_{diff} = 0.71, 95% [0.61, 0.81], t(810) = 14.06, p < .001, d = 0.34, 95% CI [0.02, 0.66]) as compared to those with lower humility scores (M_{diff} = -0.07, 95% [-0.23, 0.37], t(810) = -0.45, p = .65, d = -0.09, 95% CI [-0.67, 0.50]). However, scientific curiosity did not moderate sharing of posts with sacred versus non-sacred values (p = .22). Neither humility nor curiosity were assessed in the US survey.

Neuroimaging results

Participants who started getting fact-checked in the second half of the fMRI session exhibited higher activation in the left dorsomedial prefrontal cortex, the left middle and inferior temporal gyrus, the cerebellum and the occipital cortex (thresholded at T = 3.35, k = 229, p < .001 FWEc) in response to sacred (vs. non-sacred) values compared to participants who were fact-checked from the beginning of the fMRI paradigm (see Figure 2c and Table 3c), suggesting a reduced response to fact-checking in participants who were habituated to fact-checks from the start. 63% of these areas overlapped with the default mode network, 21% with the visual network and 6% with the frontoparietal network.

For the sacred versus non-sacred values contrast, the top 3 non-anatomical words most frequently associated with the peak activation coordinates of each of these clusters in *Neurosynth* (Yarkoni et al., 2011) were*: language* (z-score = 10.62), *sentences* (z-score = 10.45) and *sentence* (z-score = 9.87) for the left middle temporal gyrus cluster; *negative positive* (z-score = 5), *inferences* (z-score = 4.96) and *social* (z-score: 3.86) for the left dorsomedial prefrontal cluster; *autobiographical* (z-score = 10.13), *autobiographical memory* (z-score = 8.98) and *default mode* (z-score = 7.65) for the left precuneus; *intention* (z-score = 5.17), *disorder ocd* (z-score = 5.11), and *ocd* (z-score = 4.93) for the left middle frontal cluster; and *phonological* (z-score = 13.16), *language* (z-score: 11.68) and *syntactic* (z-score = 11.46) for the left inferior frontal cluster.

For the value by fact-check interaction contrast, the top 3 non-anatomical words associated with the resulting clusters in Neurosynth were: *mind tom* (z-score = 8.92), *tom* (z-score = 8.51) and *theory of mind* (z-score = 6.69) for the right dorsomedial prefrontal cluster; *default* (z-score = 8.23), *autobiographical* (z-score = 7.24) and *default mode* (z-score = 7.17) for the precuneus cluster; *episodic memory* (z-score = 7.38), *episodic* (z-score = 6.31) and *encoding* (z-score = 5.78) for the hippocampus; *experiencing* (z-score = 6.19), *imagined* (z-score = 5.37) and *solving* (z-score = 4.23) for the left cerebellum; and *empathy* (z-score = 6.06), *mind* (z-score = 5.51) and *theory of mind* (z-score = 5.28) for the right cerebellum.

Supplementary discussion

In terms of moral-emotional language, we found that using more moral-emotional words increased misinformation sharing across Spanish conservatives and in Republicans fused with Trump. This is aligned with previous work on the effects of moral-emotional language in sharing online content (Brady et al., 2017). Of note, our moral-emotional versions of the items were particularly aggressive, emulating the tone employed by some of the relevant political leaders on social media. This could have made moderate conservatives more reluctant to share social media posts with strong moral-emotional language.

Contrary to our expectations, media literacy was associated with greater likelihood of sharing misinformation in the Spanish sample (but not the US sample), especially when it was relevant to sacred values. This may be due to participants being overconfident in their literacy skills. Intellectual humility was associated with lower likelihood of sharing misinformation in the Spanish sample, but it predicted higher sharing of sacred values compared to non-sacred values. This finding adds nuance to the previously reported protective effects of intellectual humility against misinformation (Bowes & Tasimi, 2022), suggesting that the benefits of intellectual humility dissolve when appealing to sacred values in online messages.

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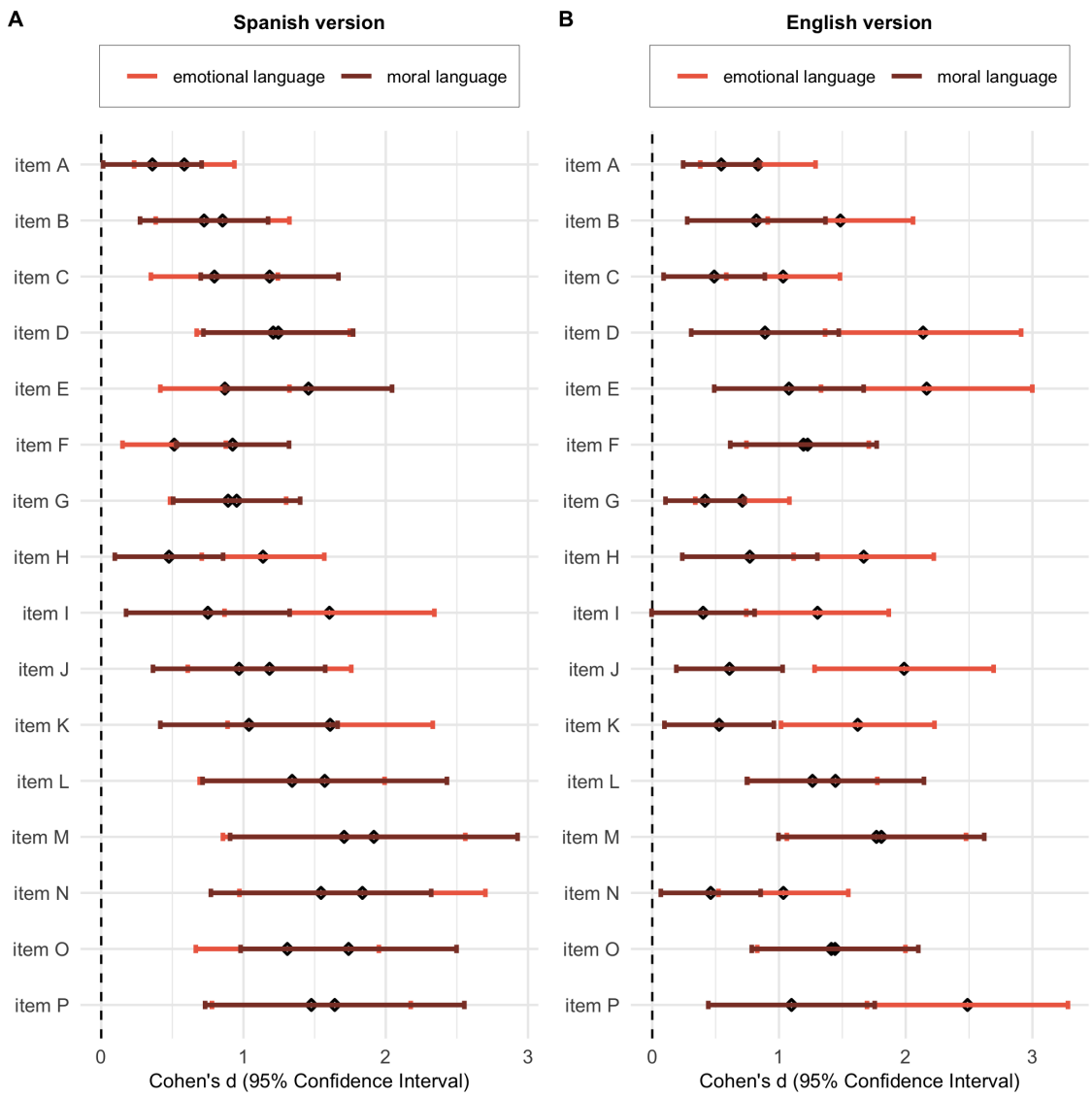

Fig. S1. Differences in moral and emotional language in the two language versions for each item. The moral-emotional language and neutral language versions of the employed sacred and non-sacred value items across the three studies were perceived as different in emotional language (Spanish version: $p < 0.005$, English version: $p < 0.001$) and moral language (Spanish version $p < 0.05$, English version: $p < 0.05$).

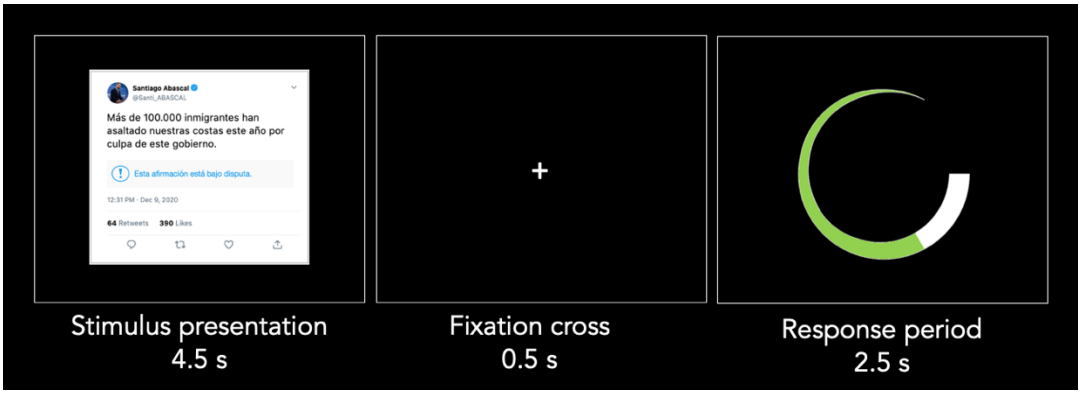

Fig. S2. Trial structure of the fMRI paradigm. Trials in the neuroimaging paradigm included a 4.5-second stimulus presentation period and a 2.5-second response period separated by a brief resting interval of 0.5 seconds. Participants responded using a 6-point circular response scale by means of a right/left button following (Kahnt et al., 2011). Tweets were generated with Tweetgen.com.

Table S1. Value sacralization across study populations. Percentage of respondents who are not willing to give up values associated with immigration, nationalism, and women and family values (proposed sacred values) as compared to values associated with roads and infrastructure, foreign affairs, and waste and materials (proposed non-sacred values).

% Participants who deem value sacred		Spanish sample		US sample	fMRI sample	
		Center-right	*Far-right*			*Num. of items*
Proposed sacred values	*Immigration*	45%	68%	58%	61%	3
	Nationalism	71%	78%	63%	64%	3
	Women and family values	46%	64%	68%	64%	2
Proposed non-sacred values	*Roads & infrastructure*	5%	6%	15%	8%	3
	Foreign affairs	14%	17%	23%	6%	2
	Waste & Materials	3%	7%	16%	3%	3
Total						16

Table S2. List of items used in the US study. For each item, we include the moral-emotional language and the neutral language formulation.

Items on sacred values		**Likes**	**Retweets**
1	*Blindly believing the woman's side of the story causes 1 in 4 innocent men to be victimized with false abuse accusations.*	65	407
	Always believing the woman's side of the story means that 1 in 4 men are accused without having actually done anything.		
2	*We pay 1.6 billion annually through taxes to make it so that Planned Parenthood can keep killing unborn children*	76	479
	The government allocates 1.6 billion annually to finance Planned Parenthood. They are highly dependent on taxpayers.		
3	*It is an attack on the nation that American families are forced to learn Spanish to work at some companies in the US.*	80	398
	It doesn't make much sense that Americans have to learn Spanish to work at some companies.		
4	*The new government is pushing a disgraceful bill that will forbid our children from saying the pledge of allegiance.*	85	217
	The new government is proposing a bill that will not require the pledge of allegiance to be recited in schools.		
5	*The pathetic Biden administration is considering a bill that would rob young Americans of the right to fly the flag on college campuses.*	98	416
	The Biden administration is considering a bill that would ban flying the American flag on college campuses.		
6	*This year alone, more than 1 million illegal immigrants have infiltrated our border because they want handouts from our socialist government.*	64	390
	This year alone, more than 1 million people have entered our country without documentation, drawn by government aid programs.		
7	*3 out of 4 illegal immigrants who enter our country end up in criminal gangs, endangering our American way of life.*	82	360
	3 out of 4 people who enter our country without documentation find themselves getting part-time jobs, weakening American society.		
8	*It is intolerable that this year the government handed out more money to illegal immigrants than to American families in need.*	58	340
	This year the government is allocating more money to newcomers than to citizens with few resources.		
Items on non-sacred values		**Likes**	**Retweets**
1	*The communist Biden administration is starting to decrease trade with Lithuania. The current government is an enemy of freedom and the nation.*	91	411
	The Biden administration is starting to decrease trade with Lithuania. This will limit our possibilities as a country.		

2	*That the government has slashed the funding for American embassies in the Asia-Pacific region is an attack against the nation.*	63	366
	The fact that the government has reduced funding for American embassies in the Asia-Pacific region limits our foreign policy.		
3	*The government demands less steel in containers, condemning thousands of American families who depend on the steel industry to poverty.*	54	363
	The government is limiting the steel content of containers, which means less income for the American steel industry.		
4	*The totalitarian Democrats announced its new plan to regulate construction materials-- they only want to cover up their corruption.*	53	414
	The Democrats presented its new plan to regulate construction materials, which will probably slow the construction industry.		
5	*This phony government is imposing government regulations on waste treatment plants. They're just trying to avoid corruption charges.*	77	210
	The government proposed to modernize several waste treatment plants in our country to comply with new standards.		
6	*The government is blatantly ignoring the US citizens plagued by the deteriorating national highways.*	82	203
	The government has yet to attend to the US citizens affected by the deteriorating road network.		
7	*This inept government sows chaos once again by changing the name of highways and accesses to the national highway system.*	80	398
	Several sectors are puzzled by the change in the name of highways and access to the national highway system.		
8	*The government is incompetent, manipulating at will what is considered part of the national highway.*	83	483
	The government decided to change the technical criteria of which sections and roads can be categorized as part of the national highway system.		

Table S3. ROIs of the neural networks included in the Functional Connectivity analysis.

		MNI coordinates		
CONN Regional label	Description	x	y	z
Default mode network				
DefaultMode.MPFC	medial prefrontal cortex	1	55	-3
DefaultMode.LP (L)	left lateral parietal cortex	-39	-77	33
DefaultMode.LP (R)	right lateral parietal cortex	47	-67	29
DefaultMode.PCC	posterior cingulate cortex	1	-61	38
Frontoparietal network				
FrontoParietal.LPFC (L)	left lateral prefrontal cortex	-43	33	28
FrontoParietal.PPC (L)	left posterior parietal cortex	-46	-58	49
FrontoParietal.LPFC (R)	right lateral prefrontal cortex	41	38	30
FrontoParietal.PPC (R)	right posterior parietal cortex	52	-52	45
Salicence network				
Salience.ACC	anterior cingulate cortex	0	22	35
Salience.AInsula (L)	left anterior insula	-44	13	1
Salience.AInsula (R)	right anterior insula	47	14	0
Salience.RPFC (L)	left rostral prefrontal cortex	-32	45	27
Salience.RPFC (R)	right rostral prefrontal cortex	32	46	27
Salience.SMG (L)	left supramarginal gyrus	-60	-39	31
Salience.SMG (R)	right supramarginal gyrus	62	-35	32
Dorsal attentional network				
DorsalAttention.FEF (L)	left frontal eye fields	-27	-9	64
DorsalAttention.FEF (R)	right frontal eye fields	30	-6	64
DorsalAttention.IPS (L)	left intraparietal sulcus	-39	-43	52
DorsalAttention.IPS (R)	right intraparietal sulcus	39	-42	54

Table S4. Neuroimaging results. Neural activity resulting from (a) the contrast between sacred and non-sacred values (*results of this contrast were reported at a more conservative threshold (0.05 FWE peak-level) due to generalized activation across the brain at lower thresholds), (b) the interaction contrast between sacred values and fact-checks, and (c) differences associated with sacred vs non-sacred values in participants who started with control trials and those who started with fact-checked trials.

			MNI coordinates			
Regional label	k	t(35)	x	y	z	P-FWEc
(a) ***Sacred > non-sacred values****						
L middle temporal gyrus	817	9.21	-52	-30	0	< .001
L fusiform gyrus	861	8.85	-30	-78	-4	< .001
L inferior occipital gyrus	1171	8.69	36	-78	0	< .001
L middle temporal gyrus	598	7.84	-50	-2	-20	< .001
L superior medial frontal gyrus	717	8.01	-4	48	38	< .001
L middle frontal gyrus	583	7.85	-38	10	42	< .001
R middle temporal gyrus	605	7.61	-50	-4	-18	< .001
L precuneus	205	6.91	-8	-56	30	.002
L inferior parietal lobule	58	6.84	-34	-58	54	.004
R inferior frontal gyrus (pars Triangularis)	44	6.71	38	14	28	.010
L inferior frontal gyrus (pars Opercularis)	69	6.67	-48	12	18	.003
(b) ***Sacred > non-sacred values; fact-checked > control trials***						
L parahippocampal gyrus	376	5.55	-16	-26	-12	.009
L cerebellum	500	5.51	-30	-80	-30	.003
bilat superior medial frontal	1675	5.26	12	60	24	<.001
R cerebellum	591	5.18	24	-78	-38	.001
Cerebellar vermis/ R posterior cingulate	1101	4.44	6	-68	-10	<.001
(c) ***Sacred > non-sacred values; control first > fact-checked first***						
L superior medial frontal gyrus	588	6.77	-4	52	38	.002
R linual/L calcarine gyrus	739	5.14	6	-72	12	.001
L middle/inferior temporal gyrus	2555	5.13	-48	-28	-6	<.001
Cerebellar vermis	512	4.24	-14	-52	-20	.003

Table S5. Functional connectivity results. General psychophysiological interaction analysis results, including functional connectivity differences between social media posts relevant to sacred compared to non-sacred values.

			MNI coordinates				
Analysis Unit	Network	t(35)	x	y	z	p-unc	p-FDR
Seed: R rostral prefrontal	Salience	F(3,33) = 5.89	32	46	27	.002	.023
L lateral prefrontal	Frontoparietal	3.29	-43	33	28	.002	.012
R lateral prefrontal	Frontoparietal	3.27	41	38	30	.002	.012
L posterior parietal	Frontoparietal	3.23	-46	-58	49	.003	.012
R posterior parietal	Frontoparietal	3.22	52	-52	45	.003	.012
Medial prefrontal	Default Mode	3.12	1	55	-3	.004	.013
Seed: L posterior parietal	Frontoparietal	F(3,33) = 7.82	-46	-58	49	<.001	.008
R supramarginal gyrus	Salience	3.52	62	-35	32	.001	.016
L supramarginal gyrus	Salience	3.31	-60	-39	31	.002	.016
R rostral prefrontal	Salience	3.23	32	46	27	.003	.016