Supporting Information

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SI Text

Study 1: Abortion Attitude Items. Participants were asked to report how much they (and each of the other targets) agreed or disagreed with each of the following statements on a scale ranging from 1 (strongly disagree) to 7 (strongly agree). These questions were:

1. I believe that minors (under the age of 18) should be allowed abortions without parental consent.
2. I believe that women should not seek abortions after rape or incest. (Reverse scored)
3. I would support a ban on partial birth (late-term) abortions. (Reverse scored)
4. I believe that abortion is a personal choice and should not be limited by political policy.
5. I believe that abortions should be illegal under all circumstances. (Reverse scored)
6. I believe that anti-abortion laws limit a woman's right to decide what is best for her body.

Study 2: Same-Sex Marriage Attitude Items. Participants were asked to report how much they (and each of the other targets) agreed or disagreed with each of the following statements on a scale ranging from 1 (strongly disagree) to 7 (strongly agree). These questions were:

1. I believe that same sex couples should be granted the same marriage rights as heterosexual couples.
2. I believe that marriage should be reserved for unions between one man and one woman. (Reverse scored)
3. I would support a constitutional amendment explicitly outlawing same sex marriage. (Reverse scored)
4. I believe that marriage between any committed couple is a personal choice and should not be limited by political policy.
5. I believe that same sex marriage should be unlawful in every state in the United States. (Reverse scored)
6. I believe that laws against same sex marriage are discriminatory and infringe on the rights and freedoms of United States citizens.

Study 3: Full List of Attitude Items. Participants were asked to report how much they (and each of the other targets) agreed or disagreed with statements for one of six issues on scales ranging from 1 (strongly disagree) to 7 (strongly agree).

The six attitude items used for abortion are the same as those in Study 1, for same-sex marriage are the same as those in Study 2, and for the remaining issues are presented below.

Affirmative Action Attitude Items.

1. I believe that university admissions committees should be allowed to give some preferential treatment to women and racial minorities.
2. I believe that organizations that practice affirmative action should not be allowed to receive government funding. (Reverse scored)
3. I would support a ban on affirmative action. (Reverse scored)
4. I believe that affirmative action is a positive program that helps to ease some social inequalities.
5. I believe that admission to colleges and universities should be based solely on merit and not race or gender. (Reverse scored)
6. I believe that affirmative action makes professional life more fair for everyone.

Death Penalty Attitude Items.

1. I believe that convicted murderers should be sentenced to the death penalty.
2. I believe that the courts should not be allowed to sentence convicted criminals to the death penalty. (Reverse scored)
3. I would support a full ban of the death penalty. (Reverse scored)
4. I believe that, in some cases, the death penalty is a justified penalty for committing serious crimes.
5. I believe that the death penalty is immoral and unconstitutional. (Reverse scored)
6. I believe that the death penalty should be used as a deterrent against violent crimes.

Iraq War Attitude Items.

1. I believe that the United States was justified in invading Iraq.
2. I do not believe that the United States has a responsibility to spread democracy throughout the world. (Reverse scored)
3. I think the invasion of Iraq was a mistake by the United States. (Reverse scored)
4. I believe the United States was morally obligated to declare war on Iraq.
5. I believe that the Iraq War should have been avoided at all costs. (Reverse scored)
6. I believe that the United States acted in the best interest of humankind by invading Iraq.

Legality of Marijuana Attitude Items.

1. I believe that adults (over the age of 21) should be allowed to smoke marijuana legally.
2. I believe that the government should enforce strict punishments for people who use or sell marijuana. (Reverse scored)
3. I would support a ban on all uses of marijuana, including a ban on medical marijuana. (Reverse scored)
4. I believe that the responsible use of marijuana is no worse than the responsible use of alcohol and should not be treated as an illegal activity.
5. I believe that marijuana should be illegal in all circumstances. (Reverse scored)
6. I believe that the United States would benefit as a whole by legalizing marijuana.

Study 4. Overall, 922 people (92.3%) indicated that they do believe in God, 77 (7.7%) said they do not believe in God, and one participant did not respond. Table S1 shows the frequency with which believers (and nonbelievers) reported consulting God when making decisions, and the overall egocentric correlations for God and the average American at each frequency of consultation for both abortion and same-sex marriage. Two participants who did not respond to the frequency question are not included in this analysis.

Because people's own attitudes on abortion (reverse-scored) and same-sex marriage were significantly correlated ($r_{\text{Believers}} = 0.45$, $P < 0.001$), we reverse-scored the abortion item and averaged the two to form a composite measure of conservative—liberal beliefs. We conducted additional analyses (for believers only) on the relation between the reported frequency of consulting God when making decisions and the magnitude of egocentric correlations. As can be seen in Fig. S1, the egocentric correlation with God is greater than the egocentric correlation

with the average American for those who reported consulting God around once a day, around once a week, and around once a month, all Zs > 2.98, Ps < 0.01, but not for those who reported consulting God a couple of times a year or less than once a year, Zs < 1.2. The egocentric correlation with God was also greater than the egocentric correlation with the average American for those who responded to the frequency question with never or not applicable, $Z = 3.93$, $P < 0.01$.

We have no theoretical reason to predict a drop in the egocentric correlation for those who consult God infrequently compared to other believers and do not know whether this one deviating point is a reliable feature of people's judgments that is worthy of careful consideration or not. As can be seen in Table S1, this deviating pattern occurred only for those who reported consulting God a couple of times per year and only in their attitudes toward abortion. Further research is necessary to understand how the frequency of consultation might influence the strength of correlations between a person's own beliefs and God's presumed beliefs.

Study 5: Arguments Used in Experimental Conditions. The online survey was designed to give the impression that an issue was randomly selected from a large database of possible issues and that the arguments were selected from a large database of possible arguments. All participants read and rated arguments about affirmative action. In the pro-policy condition, participants rated one weak argument against affirmative action and then one strong argument in favor of affirmative action.

Weak Argument Against Affirmative Action. "Affirmative action makes us think about discrimination against women and racial minorities, which is an ugly aspect of our past. It is over and therefore we should just ignore it in the present. Why continue to bring up these difficult issues? We should just move on as a country. Affirmative action only pushes us to dwell on scars from the past. Move on, people."

Strong Argument in Favor of Affirmative Action. "Unfortunately, even people with the best intentions show some automatic biases that they cannot control. [In one study], researchers sent job applications to real companies. There were two groups of applications: applicants in both of the groups were equally qualified. The only way the two groups differed is that one group had applicants with typically 'White names' and one group had applicants with typically 'Black names'. Researchers found that those with typically 'White names' had a 50% greater chance of getting a call-back for an interview than those with typically 'Black names'. Thus, even when qualifications are equivalent, Blacks tend to be at a disadvantage. Affirmative action helps to overcome this disadvantage. Given that these biases are automatic and people with good intentions cannot control them, we need some solutions that ensure decisions are not influenced by the biases. Affirmative action represents one such solution."

In the anti-policy condition, participants rated one weak argument in favor of affirmative action and then one strong argument against affirmative action.

Weak Argument in Favor of Affirmative Action. "It is rumored that many popular young people, such as Paris Hilton and Britney Spears are supporters of affirmative action policies. These young stars are representatives of our society and culture, and if they support affirmative action then so should the rest of us!"

Strong Argument Against Affirmative Action. "Affirmative action is well-meaning, but it leads to reverse discrimination. Although it is intended to end discrimination in hiring and admissions processes, in effect it does the opposite. Very qualified candidates who happen to be white and/or male can be passed over strictly because of their race or sex. This kind of discrimination defeats the very purpose of affirmative action in the first place. Policies with these kinds of side-effects, that hurt people who do not deserve to be punished, cannot possibly be the best solution. There are many other policies that fight discrimination against women and minorities, without causing the kind of harm that affirmative action does."

Study 7 Pretest. Before conducting the fMRI investigation (Study 7), we pretested a set of 20 attitude items outside of the scanner, using the same presentation procedure, to ensure that these items would replicate the basic pattern of egocentric correlations observed in the preceding studies.

In this pretest, 18 members of the University of Chicago community (11 women, 7 men; 18 to 23 years, *Mdn* = 20 years) participated in exchange for $6. Participants first engaged in a procedure to determine one exemplar to represent the average American. This procedure was designed to lead participants to consistently think of the same person every time they responded to an attitude item for the average American. The experimenter first instructed them to "imagine in your mind the average American," and to "imagine one specific person to represent this generalized other." The experimenter asked participants to think about what that person might look like and who that person was, focusing on that person's beliefs, attitudes, and ideologies. Participants were then asked to tell the experimenter a first name for that person. The experimenter later entered that name into the computer program, to serve as the prompt for the average American. Participants were asked to think of that person, representing the average American, every time they saw this prompt name.

Participants were then given details of the attitude judgment task and how to complete it. The experimenter gave participants a list of the sociopolitical issues that would serve as attitude items and asked them to browse the list and ask for more information if they did not understand what was meant by each phrase. After responding to any questions about the procedure or the issue items, the experimenter started the computer program.

Participants made attitude judgments as part of a three-level (judgment target: Self, God, average American) within-subjects block design. The session consisted of six rating blocks (two blocks of each judgment target), each following a baseline block that displayed a static cross (84 s) and then a target prompt (6 s). A rating block consisted of 10 attitude judgments, displayed for 9 s each. A typical trial read, for example, "[God's] position on: [same-sex marriage]," and participants keyed their response on a 1 (completely oppose) to 5 (completely support) scale using a keyboard. Participants were forced to respond within the 9-s window, or else their response would not be recorded (this occurred in <1.3% of the trials). In the self blocks, participants indicated their own attitudes. In the average American blocks, participants indicated the attitudes of a single, specific (real or imagined) person that each participant had selected earlier in the experiment. In the God blocks, participants indicated God's attitudes, however they understood God. Participants saw one of four versions of stimulus presentation made by crossing two orders of block presentation (randomly selected, on the condition that the same judgment target was not repeated consecutively) with two orders of trial presentation (randomly selected).

Study 7: Full List of Items, Acquisition, and Supplemetal Results. Before entering the scanner, participants completed the same training procedure as in the Study 7 pretest. This included visualizing and naming the average American, as well as previewing the list of issues that would be used as stimuli.

Timeline of Scanning Procedure. Fig. S2 presents example of slide presentation shown to participants during the scanning session. Participants reported their own beliefs, God's beliefs, and the

average American's beliefs (represented by a name participants provided at the beginning of the session) on 20 different issues, divided into six different blocks (two blocks for each of the targets: Self, God, and average American). Each block consisted of 10 of the attitudes items. Each block began with fixation slide shown for 84 s, followed by a slide indicating the target to be evaluated in the block for 6 s (me, God, or the name provided to represent the average American), followed by 10 slides presenting each of the issues for 9 s each.

Full List of Items. The top line of each slide read "My position on:" in the self block, "God's position on:" in the God block, and "[Name's] position on:" in the average American block (participants provided a name to represent the average American before the study began). The following attitude objects were then presented below this top line on each slide, one at a time in one of two prerandomized orders within each block:

—the goal of universal health care
—permanent closure of all abortion clinics
—a democratic candidate for U.S. president
—government surveillance of private internet browsing
—HIV/AIDs education in the schools
—embryonic stem-cell research
—a declaration of war against Iran
—government regulation of religious congregation
—same-sex marriage
—prayer in public school
—a full ban of public smoking
—policies designed to end income disparity
—condom distribution in public high schools
—a constitutional amendment outlawing the death penalty
—marijuana for approved medical purposes
—a constitutional amendment outlawing same-sex marriage
—immediate U.S. withdrawal from Iraq
—death penalty for convicted murderers
—North Korea's nuclear weapons program
—legal euthanasia ("assisted suicide")

Each participant responded to each attitude item on a scale ranging from 1 (completely oppose) to 5 (completely support) using a button box held in his or her right hand.

Acquisition. Participants viewed stimuli while being scanned in a 3T GE Signa Scanner. The scanner recorded high-resolution anatomical T1-weighted spoiled gradient-recalled (SPGR) images for each participant in 124 1.5-mm sagittal slices with 6 ° flip angle and 24 cm field of view (FOV). We acquired functional images using a gradient-echo spiral-in/out pulse sequence (Fig. S1) with 40 contiguous 4.2-mm coronal slices separated by 0.5-mm gaps, with slices collected in an interleaved order spanning the whole brain (TR = 3 s, TE = 28 ms, flip angle = 84 °, FOV = 24 cm; 64 × 64 matrix size, fat suppressed).

We performed image processing using AFNI software. Preprocessing included motion correction, temporal smoothing using a three-point Hamming window, spatial smoothing using a 5 mm FWHM Gaussian filter, correction for slow drift using a high pass filter of 0.005 Hz (minimum T = 200 s, greater than twice the period length of the signal of interest), and spatial normalization to isometric 3-mm voxels in the UCLA ICBM 452 T1 template provided by AFNI software. We estimated BOLD responses using the general linear model and the AFNI program 3dDeconvolve (Fig. S2). We modeled the expected hemodynamic response by convolving a gamma variate waveform with stimulus timing information for the experimental conditions, and performed a within-participants regression against time-series data to yield beta coefficients for each condition. We entered voxelwise beta contrasts (God-American, self-American, self-God, two-tailed) into a one-sample between-participants t test (two-tailed, df = 16). A cluster analysis followed using a voxelwise threshold of $P < 0.005$ ($t = 3.25$), a voxel connection radius of 5.2 mm and a volume of 459 μL (17 voxels), resulting in a corrected whole-brain $a = 0.05$. Values are based on a representative median value chosen from all voxels in the cluster and cluster parameters were determined using a Monte Carlo simulation (10,000 iterations, FWHM = 5 mm.)

For ROI analysis, ROIs were drawn over the 1 × 1 × 1 mm ICBM-normalized anatomical template. Spherical ROIs were drawn, each around a specified center of mass, detailed in Table S3 and Fig. S3. Spherical regions were resampled to 3 × 3 × 3 mm space, and beta values for each participant's response estimate were averaged across voxels in each region and exported using the AFNI program 3dROIstats. Statistical ROI analyses were performed using *R*.

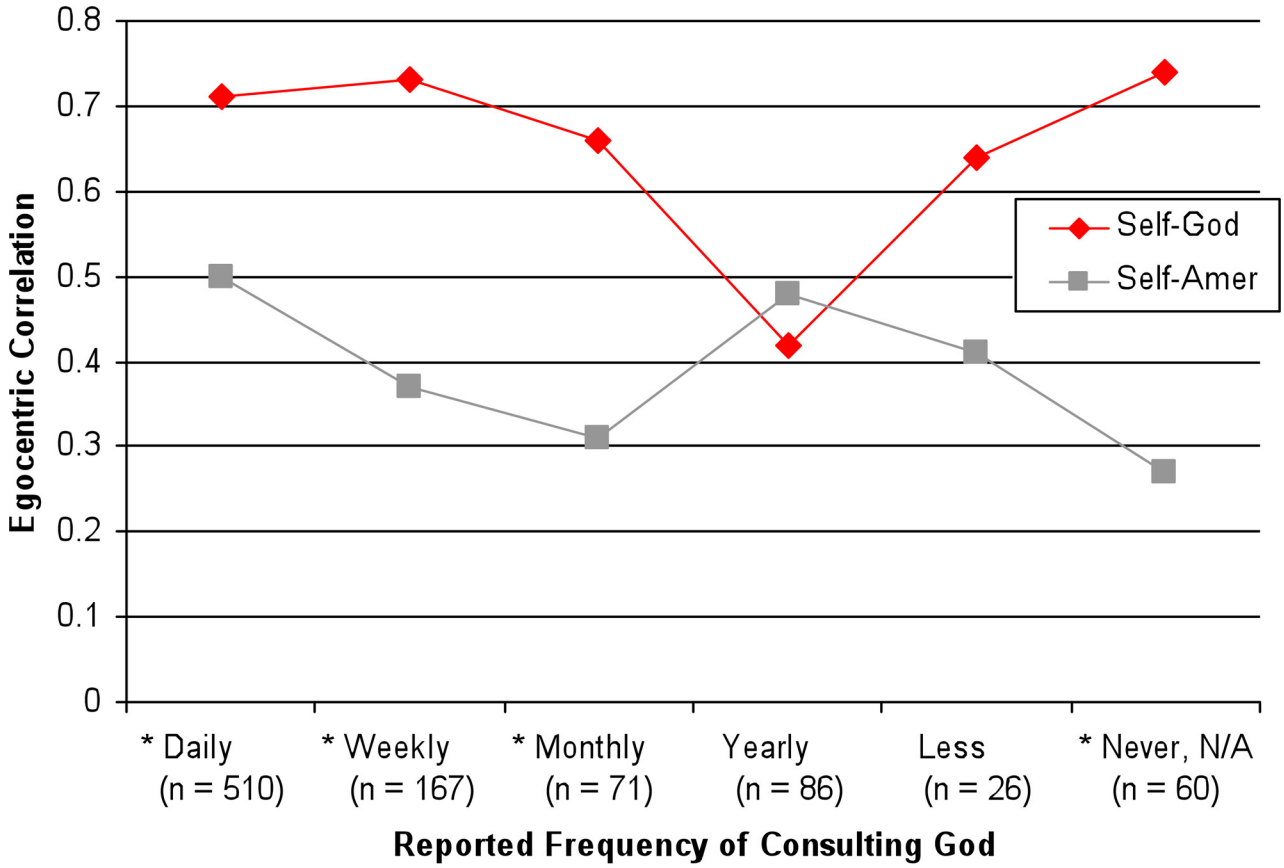
Supplemental Results. Voxelwise comparisons indicated that the God-American contrast and self-American contrast produced similar patterns of activation in the mPFC, medial precuneus, bilateral superior temporal sulcus, right medial temporal gyrus, and left insula regions, whereas the self-God contrast produced no significant differences in these regions (voxelwise Ps < 0.005, corrected; see Fig. S3 and Table S2).

We next designated nine regions of interest found previously to be associated with self and other processing (Fig. S3): Four regions covering the mPFC, a region in medial Precuneus, two regions covering bilateral temporoparietal junction, and two regions covering the bilateral temporal poles (see Fig. S4). Percentage signal change for each target within these ROIs is illustrated in Fig. S5 and results of statistical tests are detailed in Table S3.

For regions of interest within the mPFC, a 3 (condition: Self, God, average American) × 4 (mPFC region: Inferior, middle inferior, middle superior, superior mPFC) repeated measures analysis of variance revealed a significant main effect for condition, $F_{(2, 32)} = 3.80$, $P = 0.033$. Pairwise comparisons revealed that activity in the mPFC was lower when participant thought about the attitudes of the average American than when they thought about their own attitude or God's attitudes, (Ps < 0.05), whereas activity in the mPFC did not differ between the self and God conditions. The main effect for mPFC Region was also significant, $F_{(3, 48)} = 14.64$, $P < 0.0001$. Pairwise comparisons indicated that regional activation during the block was lowest in the inferior mPFC, intermediate in the middle inferior mPFC, and highest in the middle superior and superior mPFC regions (all Ps $< .05$), whereas activity in the middle and superior mPFC did not differ. The region × condition interaction did not approach significance, $F < 1$. These results are presented in Fig. 1.

A one-way ANOVA testing the main effect of condition in precuneus approached significance, $F_{(2, 32)} = 3.16$, $P < 0.056$. Pairwise t tests showed a significant effect for God vs. average American, t (16) = 2.60, $P < 0.02$. No significant pairwise effect was found for self vs. average American ($P < 0.16$) or self vs. God ($P < 0.36$). A series of 2 (hemisphere) × 3 (condition) ANOVAs were conducted for the temporoparietal junction (TPJ) and the temporal poles. TPJ showed significant effects of condition ($P < 0.008$) and hemisphere ($P < 0.0001$, left > right), but no significant interaction ($P < 0.2$). In pairwise tests, God vs. average American was significant in each hemisphere, t (16) = 3.31, $P < 0.005$ in LH, and t (16) = 2.60, $P < 0.02$ in RH. No other pairwise tests were significant. No significant main effects or interactions were found in the temporal poles.

1. Glover GH, Law CS (2001) Spiral-in/out BOLD fMRI for increased SNR and reduced suspectbility artifacts. *Magn Reson Med* 46:515–522.
2. Ward BD (2001) *Deconvolution Analysis of FMRI Time Series Data* (Tech. Rep. Biophysics Research Institute, Medical College of Wisconsin, Milwaukee, WI).
3. Buckner RL, Carroll DC (2007) Self-projection and the brain. *Trends Cog Sci* 11:49–57.



Note. An asterisk (*) indicates that the Self-God correlation is significantly different from the Self-American correlation at $p < .05$.

Fig. S1. Egocentric correlations with God and average American among believers by the frequency with which they report consulting God when making decisions.

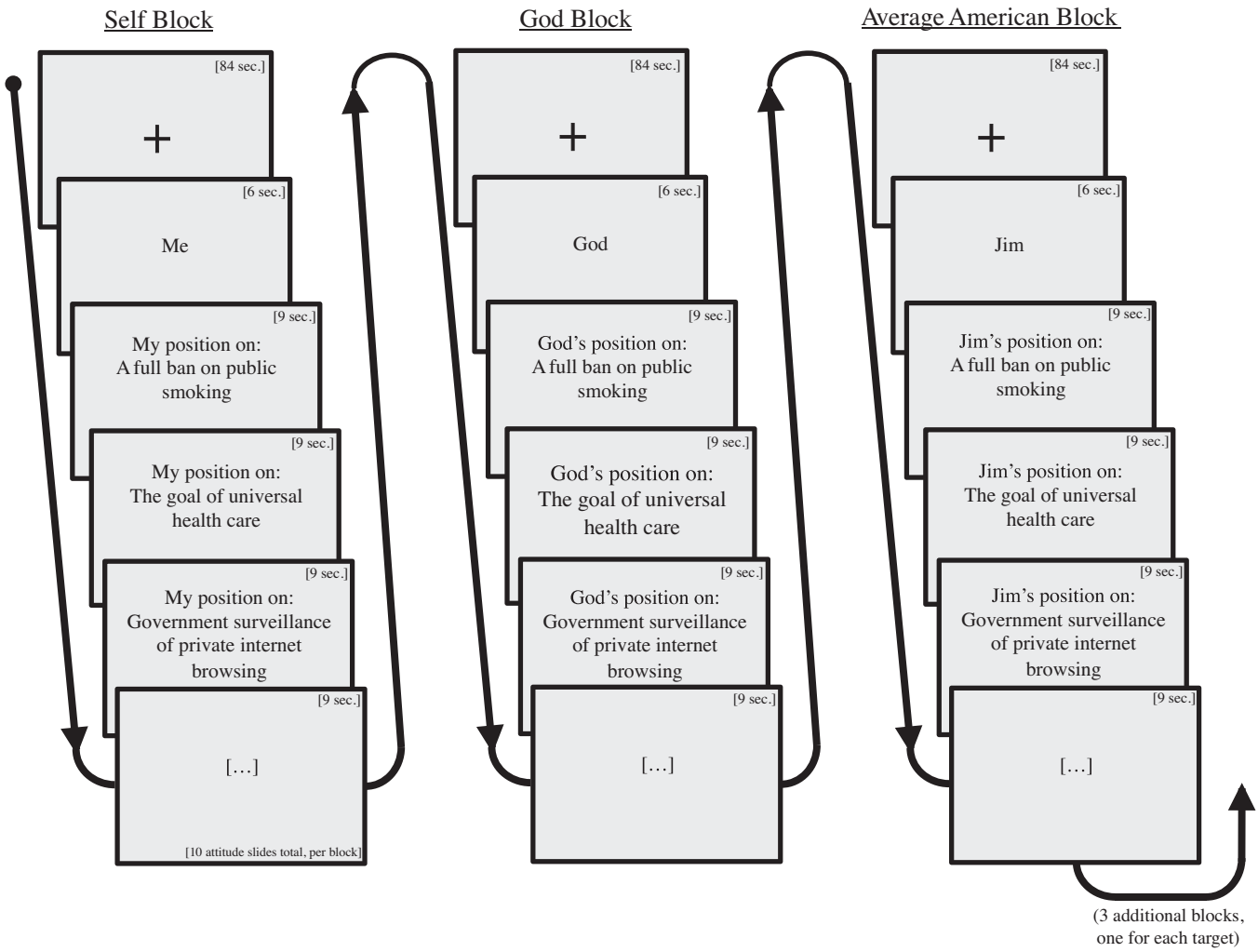


Fig. S2. A representative example of the timeline and slide presentations used in the fMRI scanning session for the three different target blocks: Self, God, and average American (represented by the name, ''Jim,'' in this example). Each block contained 10 attitude items, and each session includes six total blocks (two each for self, God, and average American). Only three attitude items are shown each block of this example for ease of presentation.

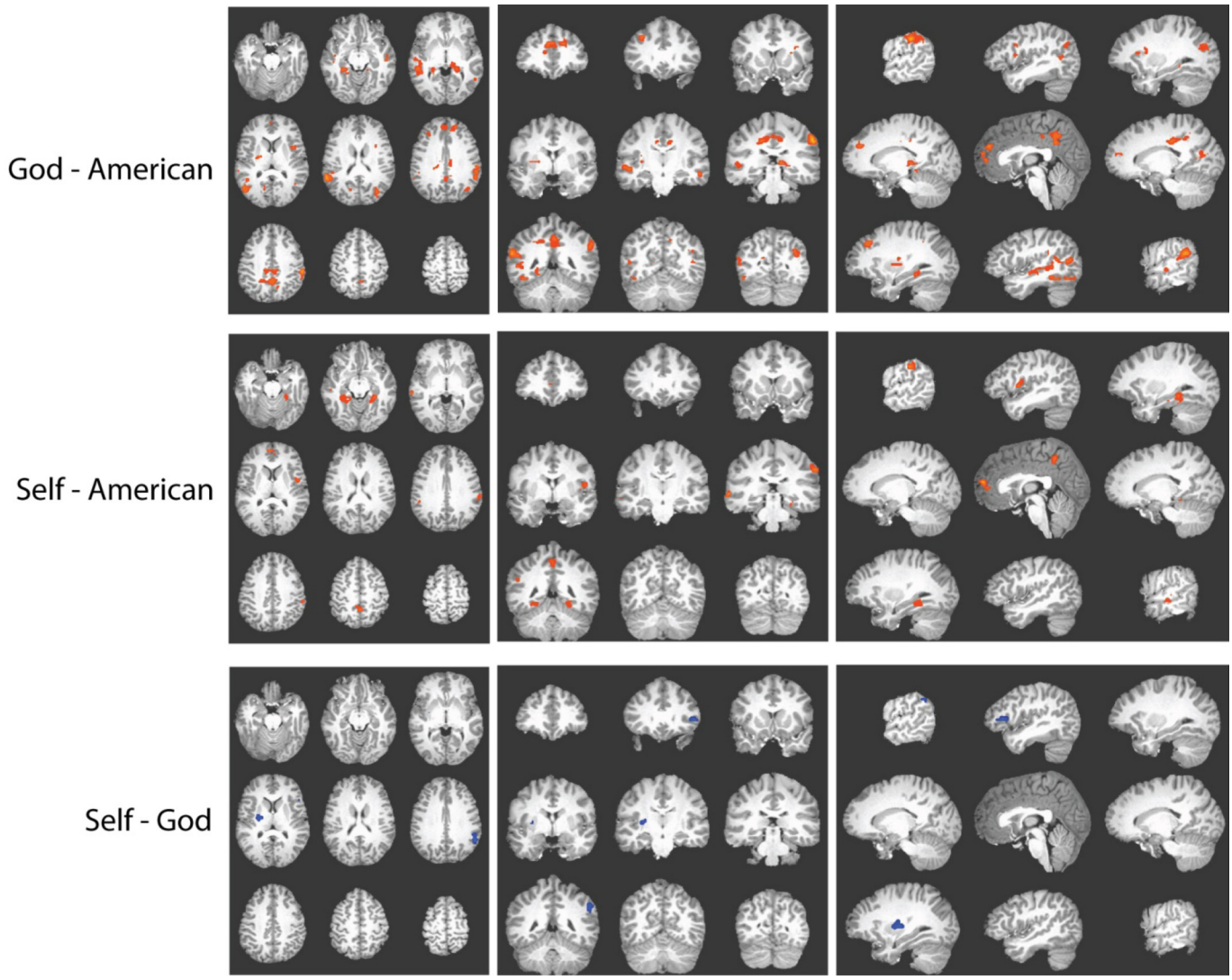


Fig. S3. Axial, coronal, and sagittal montage slices showing cluster results from the voxelwise whole-brain *t* tests (two-tailed, $P < 0.005$, corrected) showing all voxelwise results. God > American and self > American clusters are in red (top two panels), and self < God clusters are in blue (bottom panel). Corresponding region details are provided in Table S2.

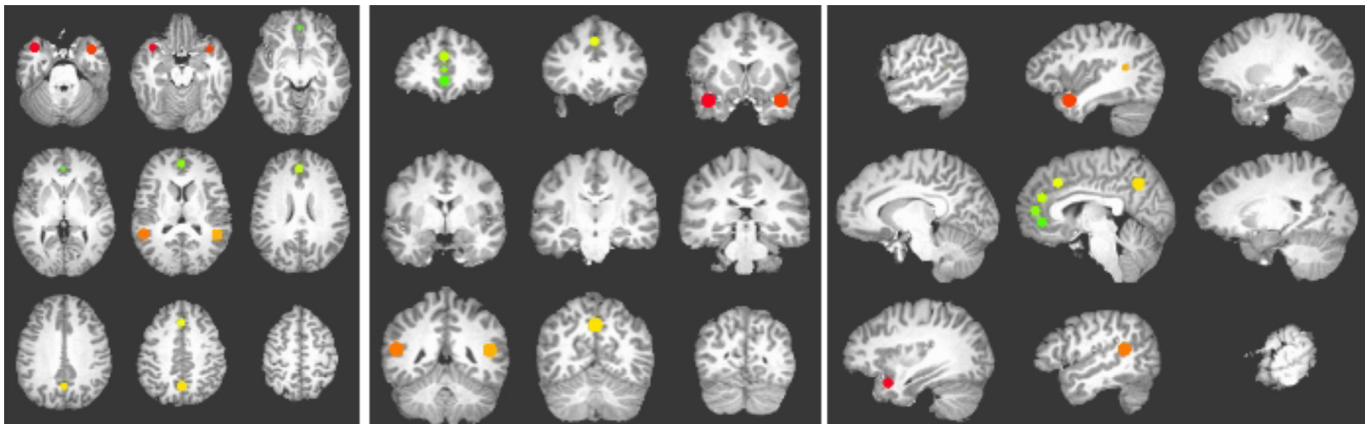


Fig. S4. Axial, coronal, and sagittal montage slices showing the location of the nine anatomically determined ROIs: mPFC (green-yellow), medial precuneus (yellow-orange), bilateral TPJ (orange), and bilateral temporal poles (red-orange and red). ANOVA tests within these ROIs are detailed in Table S3.

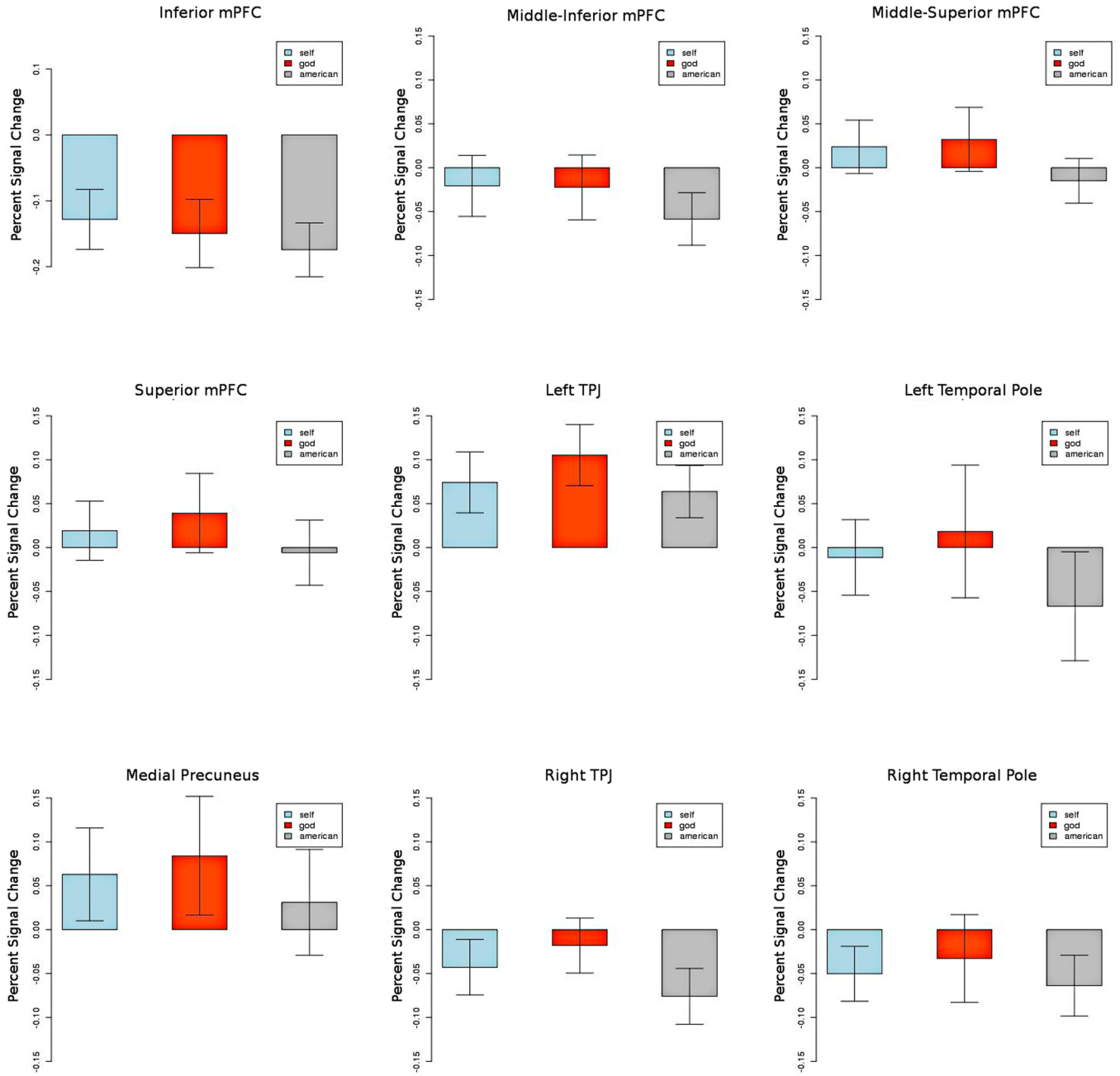


Fig. S5. ROI analysis results showing mean (± SEM) for percentage signal change of the BOLD response across subjects for self, God, and average American conditions within the nine anatomically determined ROIs, detailed in Table S3.

Table S1. Overall egocentric correlations for abortion and same-sex marriage by the frequency with which believers and nonbelievers report consulting God when making important decisions (Study 4)

		Egocentric correlations			
		Abortion		Same-sex marriage	
How often consult God?	Frequency, %	Self-God	Self-American	Self-God	Self-American
Believers (N = 920, 92.3%):					
Once a day	55.4 (n = 510)	0.62	0.50	0.75	0.44
Once a week	18.0 (n = 167)	0.57	0.33	0.74	0.43
Once a month	7.6 (n = 71)	0.59	0.38	0.68	0.32
Couple of times per year	9.3 (n = 86)	0.20	0.52	0.63	0.47
Less than once per year	2.9 (n = 26)	0.28	0.30	0.66	0.34
Never/NA	6.6 (n = 60)	0.70	0.39	0.64	0.28
Nonbelievers (N = 77, 7.7%):					
Couple of times per year	1.3 (n = 1)	—	—	—	—
Less than once a year	10.4 (n = 8)	—	—	—	—
Never/NA	88.3 (n = 68)	0.39	0.44	0.43	0.34

Table S2. Cluster results from voxelwise whole-brain *t* tests, $P < 0.005$, corrected

Region	Vol (μL)	X	Y	Z	Mean
		God-American contrast			
R Superior temporal gyrus/TPJ	3,402	−53	53	17	0.070
L/R Cingulate gyrus	3,078	−4	26	37	0.049
R Superior temporal gyrus	2,646	−50	28	−1	0.061
L/R Precuneus	2,646	−2	49	41	0.059
L Supramarginal gyrus/TPJ	2,511	57	35	36	0.080
R Parahippocampal gyrus	2,349	−34	46	−10	0.060
L Insula	1,431	37	−12	15	0.048
R Parahippocampal gyrus	1,404	18	33	1	0.052
L Middle occipital/angular gyrus	1,350	36	70	24	0.064
L/R Medial frontal gyrus/mPFC	1,323	−6	−55	13	0.068
L/R Medial frontal gyrus/mPFC	1,107	−3	−48	27	0.068
R Lentiform nucleus/putamen	810	−26	7	8	0.059
L Superior frontal gyrus	729	15	−46	29	0.059
R Superior frontal gyrus	675	−31	−33	36	0.067
L Middle temporal gyrus	621	50	55	6	0.058
R Cuneus/calcarine gyrus	594	−14	70	16	0.039
L Middle temporal gyrus	540	53	14	−11	0.073
		Self-American contrast			
L Parahippocampal gyrus	2,160	26	38	−11	0.041
R Parahippocampal gyrus	1,458	−27	40	−10	0.041
L/R Medial frontal gyrus/mPFC	972	−3	−55	12	0.087
L Supramarginal gyrus/TPJ	810	60	30	36	0.073
L/R Precuneus	756	0	46	51	0.053
L Inferior frontal gyrus (pars opercularis)	729	44	−4	9	0.055
R Middle temporal gyrus	675	−61	25	−3	0.068
R Supramarginal gyrus/TPJ	540	−52	40	26	0.061
		Self-God contrast			
L Supramarginal gyrus (TPJ)	1,377	−27	9	9	−0.046
R Lentiform nucleus	1,377	54	48	34	−0.055
L IFG	540	46	−28	7	−0.074

Center of mass coordinates (MNI Space) and mean % signal change contrast are provided for each cluster. R, right; L, left; TPJ, temporoparietal junction; Vol, volume.

Table S3. Results of *F* tests in anatomically determined ROIs (see Figs. S4 and S5)

Region	ANOVA details	Main effect for condition	Main effect for region	Interaction
MPFC	4 (MPFC subregion) × 3 (condition) within-Ss factorial	$F_{(2, 32)} = 3.80$, $P < 0.05$	$F_{(3, 48)} = 14.64$, $P < 0.001$	$F_{(6, 96)} = 0.83$, n.s.
Medial precuneus	3 (condition) within-Ss factorial	$F_{(2, 32)} = 3.16$, $P = 0.056$	n/a	n/a
TPJ	2 (hemisphere) × 3 (condition) within-Ss factorial	$F_{(2, 32)} = 5.85$, $P < 0.007$	$F_{(1, 16)} = 26.53$, $P < 0.001$	$F_{(2, 32)} = 1.74$, n.s.
Temporal poles	2 (hemisphere) × 3 (condition) within-Ss factorial	$F_{(2, 32)} = 1.98$, n.s.	$F_{(1, 16)} = 0.47$, n.s.	$F_{(2, 32)} = 1.32$, n.s.

MPFC, Medial prefrontal cortex; TPJ, temporoparietal junction; n/a, not applicable; n.s., nonsignificant.