

Electronic Supplementary Material

Pilot Study 1

This initial study seeks to accomplish three key goals: (i) to demonstrate aversion to playing God as a principle governing moral judgments, (ii) to distinguish aversion to playing God from related constructs: aversion to tampering with nature and aversion to violating religious principles, and (iii) to support our conceptualization of aversion to playing God as aversion to the exertion of human agency in domains expected to be governed by preexisting non-human sources of authority. Importantly, this first study aims to distinguish aversion to playing God from related constructs *outside* the realm of science and technology, in contrast to all subsequent studies.

Method

Participants. One hundred seventy-two United States residents (97 male, 74 female, 1 unreported, $M_{age}=36.26$) participated via Amazon.com's Mechanical Turk (MTurk) for a small payment and completed the study using Qualtrics software. For this study, sample size was determined separately for each study based on prior similar studies, and data collection stopped only when predetermined samples were attained.

Procedure. At the outset of the study, participants completed a series of demographic questions including three questions relevant to the construct of playing God: (1) political ideology ("Using the scale below please describe your political beliefs" 1=*Extremely Liberal*, 7=*Extremely conservative*), (2) religiosity ("How religious are you?" 1=*Not at all religious*, 7=*Very religious*), and (3) belief in God ("Do you believe in God?" 1=*Not at all*, 7=*Very much*).

Participants then evaluated nine different practices on six different characteristics. Practices were of three basic types: (1) three actions involving tampering with nature (nature

practices), (2) three involving religious violations (religion practices) (3) and three expected to elicit judgments of playing God, involving human interference in matters regarded as beyond the appropriate sphere of human influence (Playing God practices). The practices were as follows:

Playing God practice 1. High-frequency trading (HFT) is the use of sophisticated computers to trade large amounts of stock at extremely high rates of speed. HFT critics say the practice is used (or misused) to skim billions of dollars in profits out of the markets that would otherwise go into the retirement accounts of average mom and pop investors.

Playing God practice 2. In major league baseball, the use of human growth hormone (HGH) is prohibited. HGH builds muscle mass, increases bone density, and speeds recovery time from injury. Some athletes have used HGH after getting injured to speed up their recovery rather than rely on their bodies to heal.

Playing God practice 3. Card counting is a casino card game strategy used primarily in blackjack to determine whether the next hand is favorable to the player or to the dealer. Many casinos try to ban the practice because card counting allows players to bet more with less risk and to alter playing decisions based on the remaining cards.

Nature practice 1. Apple picking is an activity found at apple farms where people pick apples off the trees. Apple orchards may be opened to the public, allowing consumers to pick their own apples or purchase pre-picked apples.

Nature practice 2. A campfire is a fire at a campsite that provides light and warmth, and heat for cooking. It can also serve as a beacon, and an insect and predator deterrent. Campfires are a popular feature of camping, but they can also pose a danger to the surrounding woods.

Nature practice 3. Shelling is a practice that involves going to the beach, searching for seashells, and selecting interesting or unique seashells and taking them home as keepsakes.

Religion practice 1. Shabbat is the Jewish day of rest and the seventh day of the week. Observant Jews typically do not work on this day of the week and even minor work such as driving a car is technically prohibited. Nonetheless, some observant Jews do work on this day.

Religion practice 2. In Islam, it is customary that the eating of pork is prohibited. This is noted in the Quran and the act of eating pork is considered unholy, particularly in religious places. Nonetheless, some observant Muslims do eat pork.

Religion practice 3. In Hinduism, it is customary to wash one's hands and feet before and after eating. There are many reasons for this including promoting general hygiene and ensuring that disease is not spread to others. It is also considered an important part of religious purification although not all Hindus wash before eating at all times.

Participants rated each practice on the extent to which it involved playing God, involved tampering with nature, involved a religious violation, involved a “human acting agentially with intentional purpose,” whether the outcome of the practice is typically determined by a preexisting order or system, and whether the practice was morally acceptable or unacceptable. In

the case of the campfire participants evaluated letting the campfire set fire to a tree, and for the religion practices, participants evaluated *failure* to observe the practice. Items were as follows:

Tampering with Nature

1. To what extent does a trader using HFT to profit involve tampering with nature?
2. To what extent does a player using HGH to recover quickly from injury involve tampering with nature?
3. To what extent does a gambler using card counting to win involve tampering with nature?
4. To what extent does a person picking apples to bring them home for eating involve tampering with nature?
5. To what extent does a person letting a campfire burn too long and setting fire to a tree involve tampering with nature?
6. To what extent does a person shelling to take seashells home involve tampering with nature?
7. To what extent does an observant Jew working on Shabbat involve tampering with nature?
8. To what extent does an observant Muslim eating pork inside a mosque involve tampering with nature?
9. To what extent does an observant Hindu eating without washing involve tampering with nature?

Religious violation

1. To what extent does a trader using HFT to profit involve a religious violation?
2. To what extent does a player using HGH to recover quickly from injury involve a religious violation?
3. To what extent does a gambler using card counting to win involve a religious violation?
4. To what extent does a person picking apples to bring them home for eating involve a religious violation?
5. To what extent does a person letting a campfire burn too long and setting fire to a tree involve a religious violation?
6. To what extent does a person shelling to take seashells home involve a religious violation?
7. To what extent does an observant Jew working on Shabbat involve a religious violation?
8. To what extent does an observant Muslim eating pork inside a mosque involve a religious violation?
9. To what extent does an observant Hindu eating without washing involve a religious violation?

Playing God

1. To what extent does a trader using HFT to profit involve playing God?
2. To what extent does a player using HGH to recover quickly from injury involve playing God?
3. To what extent does a gambler using card counting to win involve playing God?
4. To what extent does a person picking apples to bring them home for eating involve playing God?
5. To what extent does a person letting a campfire burn too long and setting fire to a tree involve playing God?
6. To what extent does a person shelling to take seashells home involve playing God?
7. To what extent does an observant Jew working on Shabbat involve playing God?
8. To what extent does an observant Muslim eating pork inside a mosque involve playing God?
9. To what extent does an observant Hindu eating without washing involve playing God?

Morality

1. To what extent is a trader using HFT to profit morally unacceptable/acceptable?
2. To what extent is a player using HGH to recover quickly from injury morally unacceptable/acceptable?
3. To what extent is a gambler using card counting to win morally unacceptable/acceptable?
4. To what extent is a person picking apples to bring them home for eating morally unacceptable/acceptable?
5. To what extent is a person letting a campfire burn too long and setting fire to a tree morally unacceptable/acceptable?
6. To what extent is a person shelling to take seashells home morally unacceptable/acceptable?
7. To what extent is an observant Jew working on Shabbat morally unacceptable/acceptable?
8. To what extent is an observant Muslim eating pork inside a mosque morally unacceptable/acceptable?
9. To what extent is an observant Hindu eating without washing morally unacceptable/acceptable?

Agency

1. To what extent is a trader using HFT to profit acting agentially with intentional purpose?
2. To what extent is a player using HGH to recover quickly from injury acting agentially with intentional purpose?
3. To what extent is a gambler using card counting to win acting agentially with intentional purpose?
4. To what extent is a person picking apples to bring them home for eating acting agentially with intentional purpose?
5. To what extent is a person letting a campfire burn too long and setting fire to a tree acting agentially with intentional purpose?
6. To what extent is a person shelling to take seashells home acting agentially with intentional purpose?
7. To what extent is an observant Jew working on Shabbat acting agentially with intentional purpose?
8. To what extent is an observant Muslim eating pork inside a mosque acting agentially with intentional purpose?
9. To what extent is an observant Hindu eating without washing acting agentially with intentional purpose?

System

1. Independent of this action, to what extent is there a preexisting order or system that determines the outcome of stock trading?
2. To what extent is there a preexisting order or system that determines the outcome of injury recovery?
3. To what extent is there a preexisting order or system that determines the outcome of casino card games?
4. Independent of this action, to what extent is there a preexisting order or system that determines the outcome of picking apples?
5. Independent of this action, to what extent is there a preexisting order or system that determines the outcome of how fire spreads?
6. To what extent is there a preexisting order or system that determines the outcome of removing seashells from the beach?
7. To what extent is there a preexisting order or system that determines the outcome of whether an observant Jew works on Shabbat?
8. To what extent is there a preexisting order or system that determines the outcome of whether an observant Muslim eats pork in the mosque?
9. To what extent is there a preexisting order or system that determines the outcome of whether an observant Hindu eats without washing?

All items were evaluated on 7-point scales and each characteristic was evaluated in a block, with order of practices randomized within block. We computed a composite score for each characteristic for each practice type to compare these constructs. All composites had reasonable reliability ($\alpha > .63$) except three: tampering with nature evaluations for the Playing God practices, and moral judgments and agency evaluations for the Nature practices. Conducting analyses below using individual practices from these composites reveals equivalent results, except where noted below.

Results

Validating our categorization scheme, we found the following patterns: People perceived Nature practices ($M=4.28$, $SD=1.46$) to involve more tampering with nature than Playing God practices ($M=2.97$, $SD=1.27$), $t(171)=9.34$, $p<.001$, $d=1.01^1$, or Religion practices ($M=1.73$, $SD=1.07$), $t(171)=19.53$, $p<.001$, $d=2.14$. People perceived Religion practices ($M=5.86$, $SD=1.45$) to involve more religious violation than Playing God practices ($M=2.29$, $SD=1.61$), $t(171)=21.95$, $p<.001$, $d=2.37$, or Nature practices ($M=1.57$, $SD=1.08$), $t(171)=28.69$, $p<.001$, $d=3.11$. People perceived Playing God practices ($M=2.76$, $SD=1.68$) to involve more playing God than Nature practices ($M=1.78$, $SD=1.13$), $t(171)=8.72$, $p<.001$, $d=0.99$, or Religion practices ($M=2.01$, $SD=1.46$), $t(171)=5.46$, $p<.001$, $d=0.59$.

We examined the relationship between perceptions of playing God and belief in God, religiosity, and political ideology. Belief in God was correlated with perceptions of playing God for Playing God practices ($r(170)=.20$, $p<.01$) and Religion practices, ($r(170)=.29$, $p<.001$) but not for Nature practices ($r=.12$, $p=.11$). Religiosity was correlated with playing God for Religion practices ($r(170)=.24$, $p<.001$), but not Playing God or Nature practices ($rs<.13$, $ps>.11$). Similarly, political conservatism was correlated with playing God for Religion practices ($r(170)=.24$, $p=.002$), but not Playing God or Nature practices ($rs<.10$, $ps>.19$). Thus, perceptions of playing God do not reduce simply to political or religious beliefs, and the largest effects of religious and political beliefs are in the domain of religion. We explore links between perceptions of playing God, belief in God, religiosity, and political ideology more thoroughly in subsequent studies.

People judged Playing God practices ($M=3.33$, $SD=1.44$) to be less morally acceptable

¹ However, participants rated a baseball player using HGH as involving playing God ($M=4.99$, $SD=1.94$) more than the Nature practices (as a composite), $t(171)=4.23$, $p<.001$, $d=0.46$, likely because it involved scientific intervention in the human body.

than Nature practices ($M=5.23$, $SD=0.86$), $t(171)=15.28$, $p<.001$, $d=1.72^2$, or Religion practices ($M=4.38$, $SD=1.76$), $t(171)=6.74$, $p<.0001$, $d=0.74$. Thus, the actions that people judged to involve playing God—not tampering with nature or violating religious principles—to the greatest extent were the actions that they judged to be the most morally wrong.

Interestingly, separate correlations for each practice type between playing God and moral acceptability revealed significant negative associations for Playing God practices and Nature practices ($r_s<-.16$, $p_s\leq.028$)³ but not for Religion practices ($r=-.11$, $p=.15$). For Religion practices, perceptions of a religious violation were significantly negatively correlated with moral acceptability ($r(170)=-.18$, $p=.016$) as was the case for Nature actions ($r(172)=-.27$, $p<.001$)⁴, but not for Playing God actions ($r=-.06$, $p=.46$). Tampering with nature was associated negatively with moral acceptability for all practice types ($r_s<-.16$, $p_s\leq.035$)⁵. Thus, for some domains playing God will play less of a role in moral judgment compared to other factors. Overall, however, these findings clearly link moral judgment to aversion to playing God.

Finally, to examine the link between playing God and the exercise of human agency perceived to be governed by a preexisting system or order, we compared across practice type the two variables examining perceptions of human agency and perceptions of a preexisting system. Importantly, people perceived Playing God practices ($M=5.98$, $SD=1.39$) to involve more human

² However, participants rated letting a campfire spread to the woods as less morally acceptable ($M=2.89$, $SD=1.75$) more than the Playing God practices (as a composite), $t(171)=2.85$, $p=.005$, $d=0.30$.

³ However, the relationship between perceived playing God (as a composite) and moral judgment for the campfire scenario was non-significant, $r=.02$, $p=.83$.

⁴ However, the relationship between perceived religions violation (as a composite) and moral judgment for the campfire scenario was non-significant, $r=.12$, $p=.13$.

⁵ For the Nature practices, the relationship between perceived tampering with nature (as a composite) and moral judgment for the apple-picking scenario was non-significant, $r=.10$, $p=.18$. For the playing God practices, the relationship between the HGH item and moral judgment (as a composite) was marginally significant, $r(170)=-.15$, $p=.053$.

agency than Nature practices ($M=4.98$, $SD=1.34$), $t(171)=12.09$, $p<.001$, $d=1.30$, or Religion practices ($M=5.27$, $SD=1.46$), $t(171)=7.78$, $p<.001$, $d=0.85$. People also perceived outcomes of Playing God practices ($M=4.50$, $SD=1.65$) to be determined by preexisting systems more than the outcomes of Nature practices ($M=3.33$, $SD=1.77$), $t(171)=9.41$, $p<.001$, $d=1.02$, or Religion practices ($M=3.88$, $SD=2.12$), $t(171)=3.41$, $p=.001$, $d=0.37$. We also multiplied these two variables (human agency * preexisting system) for each practice type to compute a measure of perceived human agency *in* a domain governed by a preexisting system ($\alpha>.71$) and showed that this interaction measure is correlated with perceptions of playing God for Playing God practices ($r(170)=.15$, $p=.043$) and for Nature practices ($r(170)=.18$, $p=.019$) (but not for Religion practices, $r=.09$, $p=.25$). These results support our conceptualization of playing God as a perception of the exertion of human agency in a sphere deemed to be governed by a preexisting system or order.

In sum, this study supported the following three assertions: (1) Perceptions of playing God are distinct from perceptions of tampering with nature or religious violations. (2) Perceptions of playing God are linked to judgments of moral unacceptability. (3) Perceptions of playing God are linked to the perception of a practice involving human agency in a domain governed by a preexisting system or order.

Archival Study 1a

Archival Study 1a uses the 1993 (Sample A) and 1994 (Sample B) versions of General Social Survey (GSS) [1] that included a question related to aversion to playing God and a set of questions assessing attitudes toward science, and thus provide preliminary data on the phenomenon in a large, nationally representative sample.

Method

Participants. Participants in the 1993 subsample (Sample A) consisted of 685 men and 921 women ($N=1,606$; $M_{age}=46.05$). Participants in the 1994 subsample (Sample B) consisted of 1,290 men and 1,702 women ($N=2,992$; $M_{age}=45.97$). Sample sizes for this study and Studies 1b and 1c employed all available participants in the survey. For this study and Archival Studies 1b and 1c, we analyzed data from all available survey participants.

Procedure. Data were drawn from the 1993 and 1994 GSS, a survey that uses questionnaire items, with yearly variation in questions, downloaded from a public access website: <http://www3.norc.org/gss+website/>. The item we used to measure aversion to playing God was a single item included only in the years 1993 and 1994. This item consisted of a statement, “Human beings should respect nature because it was created by God,” presented with five response options: 1=*strongly agree*, 2=*agree*, 3=*neither agree nor disagree*, 4=*disagree*, 5=*strongly disagree*. We identify this item as the aversion to playing God (APG) item. Participants who, according to the GSS codebook, did not respond to the APG item on this five-point scale ($N=125$ for Sample A, $N=1672$ for Sample B) were excluded, leaving 1,481 participants in Sample A and 1,320 participants in Sample B. These participants constitute our samples in this study. Because some participants did not provide responses to additional specific items, degrees of freedom differ across subsequent analyses. This was true for subsequent studies

as well. All dependent variables or measures that were analyzed for this article's target research question are reported in the methods section for this study and all subsequent studies.

In addition to the APG item, participants answered a series of questions about their negative attitudes and beliefs toward science (first two items below are reverse-scored):

"How much confidence do you have in the scientific community?"
(1=*A great deal*, 2=*Only some*, 3=*Hardly any*)

"Modern science will solve our environmental problems with little change to our way of life"
"We believe too often in science, and not enough in feelings and faith"
"Overall, modern science does more harm than good"
"Nature would be at peace and in harmony if only human beings would leave it alone"
"Any change humans cause in nature - no matter how scientific - is likely to make things worse"
(1=*strongly agree*, 5=*strongly disagree*)

"All radioactivity is made by humans"
"All man-made chemicals can cause cancer if you eat enough of them"
"Human beings are the main cause of plant and animal species dying out"
(1=*definitely true*, 4=*definitely not true*)

An exploratory factor analysis of these items in Sample A revealed that only one item ("Modern science will solve our environmental problems with little change to our way of life") loaded negatively onto the first factor that emerged (-.28) (in Sample B the same item emerged as the only item with a negative loading on the first factor=-.05). Standardizing and averaging all nine items produced a reliability of $\alpha=.56$, but this value increased to $\alpha=.64$ when eliminating the outlying item. We thus generated a composite score for negative attitudes toward science by averaging the remaining eight items (including the outlying item produced the same results). A more negative score indicates greater support for science (overall Sample A: $M=-0.01$, $SD=0.57$; overall Sample B: $M=-0.009$, $SD=0.57$).

Results

Sample A. First, to assess the prevalence of aversion to playing God, we examined frequencies of responses on the item measuring aversion to playing God (the APG item). A

significant majority of participants (76.6%) responded, “Strongly Agree” or “Agree” to the APG item, $z=20.42$, $p<.001$.

Second, we assessed whether aversion to playing God predicted attitudes toward science, by examining the correlation between the scientific attitudes composite and aversion to playing God, $r(1478)=.32$, $p<.001$ (see Table S1 for correlations with individual items from this Sample and Sample B; all were at least marginally significant). This positive correlation suggests that, as hypothesized, aversion to playing God is linked to unfavorable attitudes toward science.

Sample B. Using the same analyses as in Sample A, we found a significant majority (77.7%) responded, “Strongly agree” or “Agree” to the APG item, $z=20.07$, $p<.001$. Aversion to playing God correlated with the same composite of negative attitudes toward science as in Sample A ($\alpha=.69$), $r(1318)=.36$, $p<.001$.

To ensure that scientific attitudes were predicted by aversion to playing God, as measured by the APG item, over and above political ideology or belief in God, we assessed both of these variables. We assessed political ideology using an item asking participants where they would place themselves on a 7-point scale: 1=*Extremely liberal*, 2=*Liberal*, 3=*Slightly liberal*, 4=*Moderate, middle of the road*, 5=*Slightly conservative*, 6=*Conservative*, 7=*Extremely conservative*. Participants who, according to the GSS guidebook, did not provide a response on this 7-point scale (3.2% in Sample A, 3.3% in Sample B) could not be analyzed.

We assessed belief in God using a 6-point measure: 1=*I don't believe in God*, 2=*I don't know whether there is a God and I don't believe there is any way to find out*, 3=*I don't believe in a personal God, but I do believe in a Higher Power of some kind*, 4=*I find myself believing in God some of the times, but not at others*, 5=*While I have doubts, I feel that I do believe in God*, 6=*I know God really exists and I have no doubts about it*. Participants who, according to the GSS

guidebook did not provide a response on this 6-point scale (3.1% in Sample A, 3.3% in Sample B) could not be analyzed.

We also assessed religiosity using an item asking, “What is your religious preference,” with response options: Protestant, Catholic, Jewish, None, and Other. Religious affiliation data for participants in the “Other” category were not included in the GSS dataset and cannot be identified by the GSS (GSS office, personal communication, February 4, 2013). Less than 1 % of respondents in Samples A and B provided a “don’t know” response or did not answer and were excluded from analyses using this item.

Sample A Results. We assessed the relationship between aversion to playing God and two demographic variables: political ideology as well as belief in God. First, political views correlated with responses to the APG item: conservatism was associated with greater aversion to playing God, $r(1432)=-.15, p<.001$. Despite this association, correlations between aversion to playing God and the composite reflecting scientific attitudes remained significant, when controlling for political views, $r(1429)=.33, p<.001$.

Second, similar correlational analyses indicated belief in God and responses to the APG item were highly correlated, $r(1433)=-.43, p<.001$, such that the more people believed in God, the more they expressed an aversion to playing God. We also conducted the same correlational analyses between aversion to playing God and the scientific attitude composite, controlling for belief in God and the association remained significant, $r(1429)=.27, p<.001$.

Finally, we conducted exploratory analyses assessing aversion to playing God across different levels of belief in God and across different religious affiliations. We first examined aversion to playing God (as above, coded “1” for some or strong agreement; otherwise “0”) at all response levels of the GSS item assessing “belief in God” by conducting binomial tests.

Proportions of the sample that scored “1”, “2”, “3”, “4”, “5”, and “6” on the belief in God measure were, respectively, 2.9%, 3.9%, 8.1%, 3.2%, 14.2%, and 64.6%. Significantly more than half of respondents who scored a “4” (66%), “5” (65%), or “6” (88%) on belief in God expressed some or strong agreement with the APG item ($z=2.04, p<.05$; $z=4.27, p<.001$; $z=23.45, p<.001$, respectively). About half of respondents who scored a “1” (49%, $p=1$) and respondents who scored a “3” (48%, $p=.78$) on belief in God expressed some or strong agreement with the APG item. Significantly more than half of respondents who indicated a “2” (78%) on belief in God expressed *no* aversion to playing God, $z=4.07, p<.001$. These results indicate that at least some people who express weak or no belief in God nevertheless report being averse to playing God.

Using religious affiliation as a measure of religiosity, we coded people who indicated Protestant (64.0% of sample), Catholic (22.1% of sample), “Other” (2.4% of sample), or Jewish (2.1% of sample), as religious and participants who answered “None” (9.0% of sample) as nonreligious (again, excluding participants who reported “don’t know” or no answer). T-tests on the APG item and the scientific attitude composite revealed significant differences. Religious participants reported significantly less favorable attitudes toward science than non-religious participants ($M=-0.02, SD=0.56$ vs. $M=0.09, SD=0.60$), $t(1472)=2.12, p=.034, d=0.11$, and also reported more aversion to playing God as well, ($M=2.00, SD=0.86$ vs. $M=2.84, SD=1.21$; lower scores indicate greater aversion), $t(1472)=10.33, p<.001, d=0.54$. These results suggest a role for religion in aversion to playing God, but also demonstrate that even amongst non-religious people, aversion to playing God is present. Non-religious people’s responses on the APG item were lower than the mid-point of the scale, “3,” indicating more agreement than disagreement with aversion to playing God.

Sample B Results. Aversion to playing God was correlated with political ideology, $r(1274)=-.09, p<.01$, such that greater conservatism was again associated with greater aversion to playing God. Importantly, the correlation between aversion to playing God and the composite of scientific attitudes remained significant when controlling for political views, $r(1271)=.36, p<.001$. Aversion to playing God was correlated with belief in God, $r(1274)=-.40, p<.001$), as in Sample A. Nonetheless, the correlation between aversion to playing God and the composite of scientific attitudes remained significant when controlling for belief in God, $r(1271)=.32, p<.001$.

As with Sample A, we conducted binomial tests at different levels of strength of belief in God. Proportions of the sample that scored “1”, “2”, “3”, “4”, “5”, and “6” on the belief in God measure were, respectively, 2.3%, 2.8%, 9.2%, 3.6%, 15.8%, and 62.9%. Significantly more than half of respondents who scored a “5” (66%) or “6” (89%), expressed some or strong agreement with the APG item ($z=4.51, p<.001$; $z=22.39, p<.001$, respectively). Approximately half of respondents who scored a “1,” “2,” “3,” or “4” (35%, $p=.15$; 49%, $p=1$; 48%, $p=.79$; 60%, $p=.19$, respectively) expressed some or strong agreement with the APG item. Thus, sample B, like sample A, provides evidence that aversion to playing God exists in some proportion of non-believers.

As in Sample A, using religious affiliation as a measure of religiosity, we coded people who indicated Protestant (59.4% of sample), Catholic (25.1% of sample), “Other” (3.6% of sample), or Jewish (8.9% of sample), as religious and participants who answered “None” (9.0% of sample) as nonreligious (again, excluding participants who reported “don’t know” or no answer). T-tests on the APG item and the scientific attitude composite revealed similar results to Sample A. Religious participants reported significantly less favorable attitudes toward science than non-religious participants ($M=-0.02, SD=0.57$ vs. $M=0.13, SD=0.63$), $t(1315)=2.74, p=.006$,

$d=0.14$, and reported more aversion to playing God as well, ($M=1.99$, $SD=0.88$ vs. $M=2.65$, $SD=1.18$), $t(1315)=7.48$, $p<.001$, $d=0.41$. As with Sample A, these results suggest a role for religion in aversion to playing God, but also demonstrate that even amongst non-religious people, aversion to playing God is not absent. Again, non-religious people's responses on the APG item were lower than the mid-point of the scale, "3," indicating more agreement than disagreement with aversion to playing God, and their responses differed significantly from this mid-point, $t(116)=3.22$, $p=.002$, $d=0.30$.

Archival Study 1b

Archival Study 1b assessed data from 1997 (Sample A) and 2001 (Sample B) CNN/Time Magazine polls [2-3] administered to a representative sample of Americans that focused on cloning and other topics. These polls included two items in 1997 and one in 2001 that assessed aversion to cloning for reasons related to aversion to playing God as well as items reflecting attitudes toward cloning more generally.

Method

Participants. Participants in Sample A included 500 men and 505 women with the following age distribution (age was assessed categorically): 18-24 (10.0%), 25-29 (11.0%), 30-34 (12.2%), 35-39 (12.2%), 40-49 (19.9%), 50-64 (18.9%), 65+ (13.6%), and 2.1% who refused to respond. Participants in Sample B included 508 men and 507 women with the following age distribution: 18-24 (12.2%), 25-29 (9.0%), 30-34 (9.5%), 35-39 (10.7%), 40-49 (20.0%), 50-64 (20.7%), 65+ (16.0%), and 2.0% who refused to respond.

Procedure. We assessed aversion to playing God through two items in Sample A, one asking, "Do you think it is against God's will to clone animals such as sheep, or don't you feel

that way?” and one asking, “Do you think it is against God's will to clone human beings, or don't you feel this way?” Response options for both items were “Yes” (coded as 1), “No” (coded as 0), and “Not Sure” (excluded from analysis), and thus our sample for analysis consisted of 966 people who responded “Yes” or “No” to at least one of these questions. For each participant, to produce a composite score of aversion to playing God we averaged their two responses, which were correlated with each other $r(890)=.45, p<.001$ (correlation reflects only participants who had responses to both items, but analyses include participants who only had responses to one item). For Sample B, only the second item was administered, and this constituted our measure of aversion to playing God.

To assess general attitudes toward cloning in Sample A, we standardized and averaged the following 12 items ($\alpha=.84$) to produce a composite (response options and our coding of these options follows each item):

“In general, do you think is a good or a bad idea to clone animals such as sheep?” (1=*Good idea*, 0=*Bad idea*, Excluded: *Not sure*)

“Do you think that it is morally acceptable to clone animals such as sheep, or don't you feel that way?” (1=*Yes*, 0=*No*, Excluded: *Not sure*)

“As you may know, scientists might one day be able to identify animals such as sheep, chickens, cows, and pigs which grow the fastest on the least amount of food and clone them in order to create large flocks of genetically identical animals, which would be less expensive for farmers to raise. Would you consider this a positive or a negative discovery?” (2=*Positive Discovery*, 0=*Negative Discovery*, 1=*Some of Both*, 1=*Neither*, Excluded: *Not sure*)

“Do you think you would or would not eat vegetables and fruits that are clones?” (1=*Would eat*, 0=*Would not eat*, Excluded=*Not sure*)

“Do you think you would or would not eat meat from animals that are clones?” (1=*Would eat*, 0=*Would not eat*, Excluded=*Don't Eat Meat*, *Not sure*)

“Which do you think is more likely--that the new cloning techniques will help solve some of the problems that the world faces, or that cloning will create more problems than it solves?” (1=*Will solve problems*, 0=*Will create more problems than it solves*, Excluded=*Not sure*)

“In general, do you think it is a good idea or a bad idea to clone human beings?” (1=*Good thing*, 0=*Bad thing*, Excluded: *Not sure*)

“Do you think that it is morally acceptable to clone human beings, or don't you feel this way?” (1=*Yes*, 0=*No*, Excluded: *Not sure*)

“In general, would you consider it a good idea or a bad idea to clone not whole human beings, but body parts or vital organs for transplants that are needed as a result of accidents or disease?”
(1=*Good thing*, 0=*Bad thing*, Excluded: *Not sure*)

“Do you think you would or would not take part in a demonstration against the cloning of human beings?” (1=*Would not*, 0=*Would*, Excluded: *Not sure*)

“In general, does the prospect of cloning human beings scare you, or not?” (1=*Does not scare*, 0=*Scares*, Excluded: *Not sure*)

“If you had the chance, would you clone yourself, or, wouldn't you do that?” (1=*Would clone*, 0=*Wouldn't do that*, Excluded: *Not sure*)

To assess general attitudes toward cloning in Sample B, we standardized and averaged the following 17 items ($\alpha=.84$) to produce a composite (response options and our coding of these options follows each item):

“Do you think is a good or a bad idea to clone animals such as sheep?”

“In general, do you think it is a good idea or a bad idea to clone human beings?”
(1=*Good idea*, 0=*Bad idea*, Excluded: *Not sure*)

“Do you think each of the following justifies creating a human clone or don't you think so?
...To save the life of the person who is being cloned?”
...To help infertile couples to have children without having to adopt”
...To produce copies of humans whose vital organs can be used to save the lives of others”
...To create genetically superior human beings”
...To allow parents to have a twin child at a later date if they wanted to”
...To allow parents who have lost a child to create a clone of the child they lost”
...To allow gay couples to have children using only their own genes”

(1=*Justifies*, 0=*Does not justify*, Excluded: *Not sure*)

“Do you think scientists should be allowed to clone human beings or don't you think so?”
(1=*Should be allowed*, 0=*Should not be allowed*, Excluded: *Not sure*)

“If scientists could clone the following people, do you think they should do so?”

...Albert Einstein
...Michael Jordan
...Beethoven
...Abraham Lincoln
...Isaac Newton
...Humphrey Bogart

(1=*Yes*, 0=*No*, Excluded: *Not Sure*)

“If you had the chance, would you clone yourself, or, wouldn't you do that?” (1=*Would*, 0=*Would not*, Excluded: *Not sure*)

A more positive score on these composites reflects more favorable attitudes toward cloning (overall Sample A: $M=0.007$, $SD=0.60$; overall Sample B: $M=0.007$, $SD=0.66$).

Results

Sample A. As predicted, a negative association emerged between aversion to playing God in the context of cloning and favorable attitudes toward cloning, $r(964)=-.56, p<.001$, and aversion to playing God in cloning was negatively correlated with each item individually ($r_s<-.13, p_s<.001$; See Table S2 for individual correlations), including those items that did not specifically pertain to animals or humans. Critically, we also examined below the relationships among aversion to playing God, religious affiliation, political party, and religiosity, demonstrating that religion and political affiliation did not fully account for these results.

Sample B. As in Sample A, a negative association emerged between aversion to playing God in the context of cloning and favorable attitudes toward cloning, $r(930)=-.34, p<.001$. Also, as in Sample A, aversion to playing God was correlated with each item individually ($r_s<-.13, p_s<.001$; See Table S3 for correlations with individual items).

To assess the impact of religion in Sample A, we inspected two items. One asked people to indicate their religious affiliation; only 47 of the 967 people who responded to this item indicated no religion. We thus turned to a more fine-grained measure of religiosity, a question asking people, “How often do you attend church or synagogue?” with response options (1) Never at all, (2) A few times a year, (3) Once or twice a month, (4) Every week/nearly every week (participants who indicated “Not sure” were excluded from this analysis). Aversion to playing God and religious attendance were not significantly correlated ($r=-.03, p=.31$), suggesting that degree of religiosity did not necessarily account for the pattern of that emerged. No significant association emerged between religious attendance and support for cloning either ($r=.02, p=.59$). The survey for Sample B did not include items pertaining to religion.

To assess the influence of political ideology in Samples A and B, we relied on two items. The first was a question asking people, “Are you Democrat, Republican, or Independent?” Using a t-test to examine only participants who indicated Democrat or Republican (as in the previous study), we found no significant effect of party on aversion to playing God in Sample A ($t=1.12, p=.26$). However, a significant difference emerged for cloning such that Republicans expressed more support overall than Democrats, $t(601)=1.96, p=.051, d=0.16$. In Sample B, Republicans ($M=0.79, SD=0.41$) reported significantly greater aversion to playing God than Democrats ($M=0.70, SD=0.46$), $t(575)=2.37, p=.018, d=.20$. Interestingly, unlike Sample A, Republicans in Sample B ($M=-0.06, SD=0.60$) reported marginally *less* support for cloning than Democrats ($M=0.03, SD=0.67$), $t(629)=1.80, p=.072, d=0.14$.

The second item was a question asking people who had indicated their party as Independent on the previous question, “Do you feel closer to the Democratic Party or the Republican Party?” (we excluded participants from this analysis who indicated “Neither Party,” “Other,” or “Not Sure”). A t-test comparing aversion to playing God between Democrats and Republicans on this measure revealed no significant difference in Sample A ($t=0.10, p=.92$) or Sample B ($t=1.59, p=.11$). A comparable t-test comparing support for cloning between Democrats and Republicans on this measure revealed no significant difference in Sample A ($t=0.83, p=.40$) or Sample B ($t=0.41, p=.69$). These findings indicate that political ideology is not necessarily driving the association between aversion to playing God and negative attitudes toward cloning despite some tendency for Republicans in Sample B to express greater aversion.

Archival Study 1c

Archival Study 1c examined data from the 2002 Public Awareness and Attitudes about Reproductive Genetic Technology Survey, administered by the Genetics and Public Policy Center [4]. This survey, administered to a representative sample of Americans, assessed attitudes toward genetic technology broadly and included a question narrowly targeting concern about this technology as a form of playing God.

Method

Participants. Participants in this sample included 570 men and 641 women ($M_{\text{age}}=47.07$).

Procedure. The key item participants read was, “When you think about these topics [concerning reproductive genetic technology], which of the following, if any, WORRIES you the MOST,” with single-response options: (1) That using these technologies is too much like playing GOD, (2) That the technologies are too new to be used SAFELY, (3) That most people will not be able to AFFORD these technologies, (4) That the technologies can easily be used for the wrong PURPOSES, (5) Or, don’t you worry about any of these? (capitalization was in the survey). We transformed this item into a categorical variable by classifying respondents who indicated that technology is too much like playing God as our *APG participants* and respondents who indicated reasons 2-4 as *other-worry participants*. We excluded people who stated they do not worry about any of these or indicated “it depends,” “don’t know,” or a refusal to answer ($N=189$). Our final sample then comprised 1,022 individuals—399 APG participants, and 623 other-worry participants. This approach allowed us to conduct a conservative test of whether aversion to playing God predicts general negative attitudes toward genetic science and technology; in particular, we predicted that those who worry about playing God in particular would report more negative attitudes than those with other worries.

To assess negative attitudes toward genetic science and technology, we used twelve items that assessed participants' basic approval/disapproval toward different practices. We did not include additional items in the survey that assessed attitudes toward governmental regulation because these items could have reflected attitudes toward the government rather than science and technology per se. Items, each containing response options "Approve" (coded 1), "Disapprove" (coded 0), Don't know (excluded), or Refused (excluded), were as follows:

- "In general, do you approve or disapprove of the use of genetic testing during pregnancy to find out whether the baby will develop a serious genetic disease?"
- "Do you approve or disapprove of the use of genetic testing during pregnancy to find out whether the baby will have desirable characteristics such as strength or high intelligence?"
- "In general, do you approve or disapprove of the use of in vitro fertilization?"
- "Would you approve or disapprove if parents were offered a way to use P-G-D [preimplantation genetic diagnosis] to...
 - ...Choose the sex of their child."
 - ... Make sure their baby does NOT have a serious genetic disease."
 - ... Make sure their baby has desirable characteristics such as high intelligence and strength."
 - ... Make sure their baby does NOT have a tendency to develop a disease like cancer when he or she is an adult."
 - ... Make sure their baby would be a good match to donate his or her blood or tissue to a brother or sister who is sick and needs a transplant."
- "Would you approve or disapprove if parents were offered a way to change their OWN genes in order to have children who would be smarter, stronger, or better looking?"
- "Would you approve or disapprove if parents were offered a way to change their OWN genes in order to prevent their children from having a genetic disease?"
- "Do you approve or disapprove of scientists working on ways to clone animals?"
- "Do you approve or disapprove of scientists working on ways to clone humans?"

These items were averaged to constitute a composite score of approval of genetic technology ($\alpha=.83$). Positive scores suggest greater approval (overall sample: $M=0.48$, $SD=0.26$).

Results

We again observed that many people reported an aversion to playing God. Thirty-nine percent of people reported this concern, rendering it the second-most reported concern and statistically indistinguishable from the most-reported concern (44.4% of people stated "that these technologies can be used for the wrong purposes," 8.8% stated, "That the technologies are too

new to be used SAFELY,” 7.7% stated “that most people will not be able to AFFORD these technologies”).

Next, we examined the binary categorization of participants as APG participants or other-worry participants. A t-test comparing approval of this technology between APG participants ($M=.36$, $SD=.24$) and other-worry participants ($M=.55$, $SD=.25$) demonstrated that participants who expressed concern over genetic issues because of aversion to playing God indicated significantly less approval of genetic technology than participants who expressed concern for other reasons, $t(1020)=12.20$, $p<.001$, $d=.76$ (see Table S4 for individual t-tests).

Next, we turned to examining religious beliefs and political ideology. The one item about religion asked participants to categorize themselves as Protestant, Catholic, Jewish, Orthodox Christian, Muslim/Islam, Buddhism/Hindu, other religion, or No religion/Atheist/Agnostic. Excluding 14 people who indicated Don’t Know/Refused, we categorized people into either non-religious if they responded “No religion/Atheist/Agnostic” or religious if they gave any other response. We first examined whether aversion to playing God differs across religiosity by examining a 2 (participant category: APG participants vs. other-worry participants) X 2 (religiosity: non-religious vs. religious) table using a chi-square analysis. This analysis showed that although religious individuals and non-religious individuals revealed a similar pattern, a greater proportion of religious individuals expressed concern over playing God (41.4%) than non-religious individuals did (17.5%), $\chi^2(1)=22.32$, $p<.001$, $\phi=.15$. Thus, we examined whether religiosity might account for the effect of aversion to playing God on disapproval toward genetic technology. We conducted a 2 (participant category: APG participants vs. other-worry participants) X 2 (religiosity: non-religious vs. religious) ANOVA on concern over genetic issues revealed only two main effects, the effect of participant category that mimicked the t-test

analysis, $F(1, 1004)=31.47$, $p<.001$, $\eta_p^2=.03$, and a smaller effect of religiosity, $F(1, 1004)=3.80$, $p=.052$, $\eta_p^2=.004$, such that religious participants ($M=.46$, $SD=.26$) indicated lower support for genetic technology than non-religious participants ($M=.57$, $SD=.28$). Most important, no interaction emerged ($F=0.015$, $p=.90$), suggesting that aversion to playing God was associated with less approval of genetic technology regardless of religiosity.

To assess whether aversion to playing God varied by political ideology, we examined responses from an item asking participants to indicate their political party (Republican, Democrat, or Independent). Because we were interested in clear liberal-conservative differences in aversion to playing God, we excluded individuals who indicated “Independent” or any other response. A 2 (participant category: APG participants vs. other-worry participants) X 2 (party: Democrat vs. Republican) chi-square analysis revealed no significant difference ($\chi^2(1)=1.94$, $p=.16$), with similar numbers of individuals expressing aversion to playing God amongst Democrats (39.1%) and Republicans (44.6%). Thus, political party does not necessarily seem to be driving these results.

Analyses of religion and politics, Study 1

Political ideology did not predict moral acceptability judgments ($r=-.06, p=.57$), but conservatism increased perceptions of playing God, $r(79)=.25, p=.024$. Religiosity did not predict perceptions of playing God ($r=.03, p=.79$) or moral acceptability ($r=-.13, p=.25$). Belief in God did not predict perceptions of playing god ($r=.18, p=.12$) but did predict reduced moral acceptability, $r(79)=-.27, p=.015$. Thus, these factors do not appear necessarily to account for the relationship between perceptions of playing God and moral judgments.

Scientific practices evaluated, Study 2

- Genetic testing during pregnancy to find out whether the baby will develop a serious genetic disease
- Genetic testing during pregnancy to find out whether the baby will have desirable characteristics such as strength or high intelligence
- In vitro fertilization (combining eggs and sperm outside the body in a laboratory)
- Using P-G-D [preimplantation genetic diagnosis] to choose the sex of one's child
- Using P-G-D [preimplantation genetic diagnosis] to make sure one's baby does not have a genetic disease
- Using P-G-D [preimplantation genetic diagnosis] to make sure one's baby has desirable characteristics such as high intelligence and strength
- Using P-G-D [preimplantation genetic diagnosis] to make sure one's baby does NOT have a tendency to develop a disease like cancer as an adult
- Using P-G-D [preimplantation genetic diagnosis] to make sure one's baby would be a good match to donate his or her blood or tissue to a brother or sister who is sick and needs a transplant
- Parents employing procedures on their OWN genes in order to have children who would be smarter, stronger, or better looking
- Parents employing procedures on their OWN genes in order to prevent their children from having a genetic disease
- Cloning animals such as sheep for scientific purposes
- Cloning humans
- Creating large flocks of genetically identical animals, which would be less expensive for farmers to raise
- Cloning fruits and vegetables
- Cloning specific body parts or vital organs for transplants that are needed as a result of accidents or disease
- Producing meat from cloned animals
- Developing technology that produces radioactive substances
- Producing human-made chemicals such as pesticides, herbicides, and insecticides
- Environmental practices that cause plants and animals to die out

Analyses of religion and politics, Study 2

We examined the relationships among aversion to playing God, moral acceptability, political ideology, religiosity, and belief in God as in Study 2. Both religiosity and belief in God were significantly and positively related to perceptions of playing God for all issues ($r_s > .12$, $p_s < .02$). Both variables were negatively related to moral acceptability of GMOs and vaccines ($r_s < -.15$, $p_s \leq .003$), but unrelated to moral acceptability for global warming or drone warfare ($p_s > .24$). Meanwhile, political ideology was significantly related only to perceptions of playing God for GMOs ($r(363) = .15$, $p = .003$) and vaccines ($r(363) = .18$, $p < .001$) such that conservatism

was related to increased perceptions of playing God for both (other issues, $p > .34$). Political ideology was also related to moral judgment of every issue, albeit inconsistently: conservatism was positively related to moral acceptability for drone warfare ($r(363) = .16, p = .002$) and global warming ($r(363) = .21, p < .001$), whereas it was negatively related to moral acceptability for GMOs ($r(363) = -.17, p = .001$) and vaccination ($r(363) = -.13, p = .012$). Importantly, all correlations between playing God and moral unacceptability remained significant ($p \leq .001$) simultaneously or separately controlling for belief in God, religiosity, and political ideology (see Table S5 for standardized betas from multiple regressions).

Allocation task, Study 3

We would like you to play the role of a politician tasked with how to divide up 100 billion dollars in the next U.S. budget. Below, are various agencies that you need to divide up the \$100 billion between. For each agency, move the slider to indicate how many billions of dollars you want to devote to it. Your choices must sum to 100 (representing \$100 billion).

Department of Labor (responsible for occupational safety, wage and hour standards, etc.)
 National Science Foundation (supports all research in biological, physical, and other sciences)
 Department of Defense (responsible for national security and armed forces)
 Federal Prison System (the system handling prisons and prisoners)
 Patent and Trademark Office (issues patents and trademarks for intellectual property)
 Library of Congress (national library of the U.S.)
 United States Agency for International Development (responsible for administering civilian foreign aid)
 Housing and Urban Development (develops policies on housing and urban problems)
 Securities and Exchange Commission (regulates the financial system)

Analyses of religion and politics, Study 3

APG was again significantly correlated with political conservatism ($r(302)=.46, p<.001$), belief in God ($r(302)=.72, p<.001$), and religiosity ($r(302)=.69, p<.001$). In addition, belief in God and religiosity significantly predicted reduced funding toward the NSF ($r_s>.17, p_s\leq.003$), whereas political ideology did not, $r=-.09, p=.13$. Nonetheless, when simultaneously or separately controlling for belief in God, religiosity, and political ideology, APG continued to predict NSF funding negatively and significantly ($p_s<.001$) (see Table S5 for standardized betas from multiple regression).

The effect of APG on funding the Department of Defense and on funding the Federal Prison System, however, were reduced to non-significance when controlling for political ideology, belief in God, and religiosity simultaneously ($p_s>.54$) (see Table S5 for standardized betas from multiple regression). Controlling for religiosity and belief in God separately did not reduce the effect of APG on Department of Defense funding ($\beta=.13, t(301)=1.71, p=.088; \beta=.13, t(301)=1.71, p=.088$), although controlling for political ideology separately did ($\beta=.04, p=.52$).

Controlling for these variables separately reduced the effect of APG on Federal Prison System funding to non-significance ($\beta_s=.10, p_s>.13$).

Allocation task, Study 4

In this study, we are giving everybody a \$.30 bonus, and here we would like to give you the opportunity to allocate that money to various organizations or to yourself. In particular, we would like you to choose whether to allocate any of that money (in cents) to two different organizations, The National Stem Cell Foundation or Cure Violence.

The National Stem Cell Foundation supports peer reviewed biomedical research in the field of adult stem cell transplantation. Adult stem cells have the potential to repair or regenerate damaged tissue and create a paradigm shift in science.

Cure Violence stops the spread of violence in communities by using the methods and strategies associated with disease control – detecting and interrupting conflicts, identifying and treating the highest risk individuals, and changing social norms.

Divide up your 30 cents between these two foundations and yourself however you like. Whatever you allocate to the two organizations we will donate, and whatever you allocate to yourself, we will distribute to you via bonus on MTurk. The sum of your allocations must total 30 cents.

Analyses of religion and politics, Study 4

APG was significantly correlated with political conservatism ($r(273)=.32, p<.001$), belief in God ($r(273)=.72, p<.001$), and religiosity ($r(273)=.59, p<.001$). Belief in God and religiosity did not significantly predict donations to stem cell research ($p_s>.83$) although political ideology did, $\beta=-.12, t(273)=1.96, p=.052$. Importantly, APG remained a significant negative predictor of stem cell research donations when simultaneously controlling for belief in God, religiosity, ideology and when separately controlling for belief in God and religiosity (see Table S5 for standardized betas from multiple regression). However, regressing stem cell research donations on ideology and APG as predictor variables revealed non-significant effects of both APG ($\beta=-.10, p=.11$) and political ideology ($\beta=-.08, p=.18$).

Allocation task, Study 5

In this study, we are giving everybody \$.30 to allocate that money to various organizations. In particular, we would like you to choose how to allocate money (in cents) to two different organizations that aim to reduce Vitamin A deficiency and hunger, the International Rice Research Institute and Helen Keller International

The International Rice Research Institute aims to reduce poverty and hunger, improve the health of rice farmers and consumers, and ensure environmental sustainability of rice farming. They have focused on producing "golden rice," a genetically modified variety of rice. Geneticists insert a gene into the rice plant that allows it to produce beta carotene, and experts believe this rice will be the key to solving hunger and that it is more effective than Vitamin A supplements.

Helen Keller International partners with governments, the private sector and other charities throughout Africa and Asia to ensure that health systems include vitamin A supplements as part of regular wellness practices for impoverished communities.

Of note, in June 2016, 107 Nobel Laureates signed a petition urging an end to opposition over Golden Rice, suggesting that Golden Rice "has the potential to reduce or eliminate much of the death and disease caused by a vitamin A deficiency (VAD), which has the greatest impact on the poorest people in Africa and Southeast Asia."

Divide up your 30 cents between these two foundations any way you like. Whatever you allocate to the two organizations we will donate. The sum of your allocations must total 30 cents.

Analyses of religion and politics, Study 5

APG was significantly correlated with political conservatism ($r(304)=.38, p<.001$), belief in God ($r(304)=.75, p<.001$), and religiosity ($r(304)=.67, p<.001$). Political ideology and religiosity did not significantly predict the donations difference ($ps>.11$) although belief in God did, $\beta=-.13, t(304)=2.29, p=.022$. However, regressing donation difference on both belief in God and APG revealed non-significant effects of both APG ($\beta=-.08, p=.36$) and belief in God ($\beta=-.07, p=.40$).

These results indicate that political ideology, religiosity, or belief in God cannot account for the association between APG and donation difference, yet for completeness we conducted all individual and simultaneous regressions as in the previous study. APG remained a marginal predictor of donation difference when also controlling for religiosity, $\beta=-.13, t(303)=1.71, p=.09$, and a significant predictor when controlling separately for political ideology, $\beta=-.14$,

$t(303)=2.35, p=.019$. Controlling for belief in God, religiosity, and political ideology simultaneously reduces the effect of APG on donation difference to non-significance, but all other predictors emerge as non-significant as well ($ps>.28$) (see Table S5 for standardized betas from multiple regression). Thus, again, these factors do not account for donation difference over and above the influence of APG.

Scientific practices, Study 6a

In this study, we would like you to evaluate two different practices that have emerged in medicine and science. We want you to evaluate these practices without giving detail about their specific purpose and implementation. One is more well-established, one is more novel.

Practice A is a procedure that is widely used in the scientific and medical community and has been approved by the government for 60 years. Essentially, this procedure is used to manipulate cellular processes within the human body and has broad implications pertaining to the birth, growth, and death of human beings. This practice is well-established and can create fundamental changes to humans' lives. Its risks are well-established as well, and it is the standard practice in place for this type of issue.

Practice B is a novel procedure that has yet to be implemented in the scientific and medical community, and was just recently approved by the government. This procedure is also used to manipulate cellular processes within the human body and has broad implications pertaining to the birth, growth, and death of human beings. This practice is completely brand new and can also create fundamental changes to humans' lives. It has the possibility of replacing the standard practice already in place for this type of issue because of its ability to improve on the risks of Practice A.

Mediation analyses, Study 6a

To determine whether the difference in perceptions of playing God mediated the effect of practice on moral acceptability, we conducted analyses, following the steps outlined by Judd, Kenny, and McClelland [5] for within-subjects mediation. For both the playing God judgment and the moral acceptability judgment, we computed an “novel practice”-minus-established practice” difference score, and confirmed that the difference score for the playing God judgment correlated with the difference score for moral acceptability, ($r(492)=-.32, p<.001$). We then computed the centered sum score for playing God and regressed the difference score for moral acceptability on the difference score and centered sum score for playing God. The significant $-.29$ slope ($t(491)=7.58, p<.001$) combined with the $.10$ intercept ($t(491)=2.90, p=.004$) indicates partial mediation. The slope for the centered sum score ($-.01$) was non-significant ($p=.24$), suggesting no moderation by the level of the mediating variable. In addition, using the MEMORE macro in SPSS [6] (percentile bootstrap; 20,000 resamples) reveals a significant

indirect effect (95% confidence interval=0.04 to 0.12), suggesting mediation as well. In sum, participants judged the novel practice to be less morally acceptable than the established practice because they perceived the novel practice to involve more playing God.

Analyses of religion and politics, Study 6a

APG was significantly correlated with political conservatism ($r(492)=.38, p<.001$), belief in God ($r(492)=.70, p<.001$), and religiosity ($r(492)=.63, p<.001$). In addition, conservatism, belief in God, and religiosity predicted moral unacceptability for both practices ($r_s<-.21, p_s<.001$). Nonetheless, when simultaneously or separately controlling for belief in God, religiosity, and political ideology, APG continued to predict moral unacceptability for both practices significantly ($p_s<.001$) (see Table S5 for standardized betas from multiple regression).

Practices in legal condition, Study 6b

In this study, we would like you to evaluate two different practices that have emerged in the justice system. We want you to evaluate these practices without giving detail about their specific purpose and implementation. One is more well-established, one is more novel.

Practice A is a procedure that has been approved by the government for 60 years. This procedure is used to sentence drug offenders, which ultimately affects the criminal justice system and the economy. This practice is well-established and can create fundamental changes to the lives of drug offenders and citizens who incur the costs of incarceration. Its risks are well-established, and it is the standard practice in place for this type of issue.

Practice B is a novel procedure that was just recently approved by the government. This procedure is used to sentence drug offenders, which ultimately affects the criminal justice system and the economy. This practice is brand new and can create fundamental changes to the lives of drug offenders and citizens who incur the costs of incarceration. It has the possibility of replacing the standard practice already in place for this type of issue because of its ability to improve on the risks of Practice A.

Analyses of belief in natural order, Study 6b

We examined the influence of belief in natural order on perceptions of playing God and moral judgment. Belief in natural order predicted perceptions of playing God for both novel and established practices in both the science and legal domain ($\beta_s > .17$, $ps < .001$). We compared these effects between conditions by regressing the playing God rating on condition (1=science, 0=legal), belief in natural order, and the product of condition X belief in natural order, and for both practices, the association between belief in natural order and perceptions of playing God was stronger in the science condition than in the legal condition, $\beta_s > .27$, $ts > 2.79$, $ps \leq .005$. Belief in natural order also predicted moral unacceptability for both practices in the science domain, $\beta_s < -.26$, $ts > 5.89$, $ps < .001$, but did not significantly predict moral judgment in the legal condition ($\beta_s < .08$, $ps > .10$). In addition, when simultaneously or separately controlling for belief in God, religiosity, and political ideology, belief in natural order remained a significant predictor of playing God ($\beta_s > .21$, $ps \leq .001$) and moral unacceptability ($\beta_s < .16$, $ps \leq .001$) in the science condition. These findings demonstrate that belief in a natural order contributes to judgments of

playing God, and again these findings suggest a tighter link between perceptions of playing God in the science domain than in the legal domain.

Mediation analyses, Study 6b

To determine whether the difference in perceptions of playing God mediated the effect of condition on differences in moral acceptability, we computed difference scores for playing God, moral acceptability, and then used bootstrapping mediation analysis using the SPSS PROCESS macro [7] (bias-corrected, 20,000 resamples). This analysis revealed that condition (science versus legal domain: coded 1 and 0, respectively) indirectly affected people's differing judgments of moral acceptability for novel versus established practices through differences in perceptions of playing God (95% confidence interval=.0025 to 0.13).

We also examined whether perceptions of playing God mediated the effect of practice on moral judgment in the science condition only to compare results with Study 6a. We first used Judd, Kenny, and McClelland's method [5] for within-subjects mediation. We confirmed that the difference score for the playing God judgment correlated with the difference score for moral acceptability, ($r(447)=-.24, p<.001$). We then computed the centered sum score for playing God and regressed the difference score for moral acceptability on the difference score and centered sum score for playing God. The significant $-.21$ slope ($t(446)=5.17, p<.001$) combined with the $.18$ intercept ($t(446)=3.89, p<.001$) indicates partial mediation. The slope for the centered sum score ($-.01$) was non-significant ($p=.79$), suggesting no moderation by the level of the mediating variable. In addition, using the MEMORE macro in SPSS [6] (percentile bootstrap; 20,000 resamples) reveals a marginally significant indirect effect (90% confidence interval=0.001 to 0.12), suggesting mediation as well.

Analyses of religion and politics, Study 6b

APG was significantly correlated with political conservatism ($r(900)=.36, p<.001$), belief in God ($r(900)=.74, p<.001$), and religiosity ($r(900)=.65, p<.001$) across conditions. We examined the effects of political ideology, belief in God, and religiosity. In the science condition, conservatism, belief in God, and religiosity predicted moral unacceptability for both practices ($r_s<-.17, p_s\leq.001$). Nonetheless, when simultaneously or separately controlling for belief in God, religiosity, and political ideology, APG continued to predict moral unacceptability for both practices significantly ($p_s<.001$). The legal condition revealed fewer significant correlations between moral acceptability and ideology, belief in God, and religiosity: Belief in God predicted moral unacceptability of the novel practice, $r(452)=-.10, p=.039$, religiosity marginally predicted moral unacceptability of the novel practice, $r(452)=-.09, p=.061$, and conservatism marginally predicted moral *acceptability* of the established practice, $r(452)=.09, p=.064$. In addition, the relationship between APG and moral unacceptability of the novel practice was reduced to non-significance when controlling in a regression for belief in God or religiosity separately ($p_s>.81$), and the relationship between APG and moral unacceptability of the established practice was reduced to non-significance when controlling in a regression for political ideology ($p=.35$) (see Table S5 for standardized betas from multiple regressions). These results provide initial evidence for the divergent roles of aversion to playing God (and its interaction with novelty) in the science domain versus the legal domain.

Analyses of religion and politics, Study 7

As specified in our preregistration plan, we conducted regressions examining political ideology, belief in God, and religiosity as predictor variables alongside condition as a predictor as well. As noted below, these demographic measures and others did not differ significantly by condition, despite unequal numbers of participants across condition ($ps > .10$). Nonetheless, we wanted to examine whether the effect of condition remained significant after controlling for these variables. To do so, we created two new condition variables, one that coded Self-playing-God as 1, Other-playing-God as 1, and Control as -2 (to reflect the planned contrast between the two playing God conditions and the control condition), and one that coded Self-playing-God as 1, Other-playing-God as -1, and Control as 0 (to reflect separate conditions). Conducting regressions using these two variables as predictors and attitudes toward scientific practices as an outcome variable while also controlling for political ideology, belief in God, and religiosity (simultaneously or separately) revealed that the condition variable representing the contrast remained significant in every case ($ps \leq .011$) (see Table S5 for standardized betas from multiple regressions). These results suggest that religious and political beliefs do not account for our findings.

Examination of Dropouts, Study 7

Based on recommendations by Zhou and Fishbach [8], we examined, by condition, frequency of participants dropping out upon ostensibly viewing, but just prior to completing the experimental manipulation prompt (including participants later excluded in the primary analysis) and found that 16.86% (59/350), 20.51% (72/351), and 8.31% (29/349) dropped out in the you-

playing-god, others-playing-god, and control condition, respectively⁶. A chi-square indicated dropout rates differed by condition, $\chi^2(2)=21.24, p<.001, \phi=.14$. Follow-up tests revealed that this effect was driven by both the you-playing-God and others-playing-God conditions differing from the control condition ($\chi^2=11.60, p=.001, \phi=.13$ and $\chi^2=21.11, p<.001, \phi=.17$), but not from each other, $\chi^2=1.54, p=.21, \phi=.047$.

Given that our control condition presented a much simpler task (to write about a meal) than the two playing God conditions, it is possible that participants simply opted out of a more difficult task. To ensure that participants did not drop out in ways that might systematically affect responses to our dependent measure (attitudes toward scientific practices), we examined all demographic variables that lent themselves to numerical values and that correlated with this measure significantly ($p<.05$) across the entire sample (including participants excluded from the primary analysis based on our preregistration plan): gender (coded 1=male, 2=female), age, belief in God, political ideology, and religiosity as measured in Studies 2-7 as well as income and education. For income, participants were asked to indicate their yearly income (less than \$20,000, \$20,000-\$40,000, \$40,000-\$60,000, \$60,000-\$80,000, \$80,000-\$100,000, and more than \$100,000; coded 1-6 with the lower value used if participants responded to more than one income level). For education, participants were asked to indicate the number of years of education, with answers coded blank if participants did not clearly specify a number.

Examining either non-dropouts alone or non-dropouts and dropouts combined, one-way ANOVAs for each of these factors revealed that none of them differed significantly by condition

⁶ This analysis and those reported below contain two dropout participants with matching demographics and IP addresses of participants who completed the study and were included in the primary analysis. Because it is uncertain if these participants constitute duplicate individuals and because they represent relevant data (of people who may have dropped out when confronted with one conditional essay prompt, but not another) we include them in these analyses.

($p > .11$). This finding remained when we included only non-dropouts who indicated they had properly completed the writing task (the participants included in our primary analysis based on our preregistration plan) ($p > .10$) and when we combined these non-dropouts from our primary analysis and dropouts ($p > .31$). Thus, it is unlikely that participants dropped out from condition in any systematic way that would have affected responses on the dependent variable, and it is more likely that increased dropout occurred in the playing God conditions resulted from factors unrelated to the present dependent measure. Furthermore, this analysis showed that people of generally similar demographic backgrounds participated in each condition.

Table S1. Correlations for individual items with aversion to playing God in Samples A and B (Archival Study 1a).

Item	Correlation - Sample A (1993)	Correlation - Sample B (1994)
“How much confidence do you have in the scientific community?”	.06 ⁺	.13**
“We believe too often in science, and not enough in feelings and faith”	.38**	.36**
“Overall, modern science does more harm than good”	.21**	.21**
“Nature would be at peace and in harmony if only human beings would leave it alone”	.18**	.21**
“Any change humans cause in nature - no matter how scientific - is likely to make things worse”	.19**	.19**
“All radioactivity is made by humans”	.09**	.28**
“All man-made chemicals can cause cancer if you eat enough of them”	.05 ⁺	.13**
“Human beings are the main cause of plant and animal species dying out”	.21**	.11**

⁺ $p < .07$; * $p < .025$, ** $p \leq .001$.

Note: Positive correlations indicate aversion to playing God corresponds to a negative assessment of science or human involvement in nature. One unexpected finding in both samples was that aversion to playing God predicted agreement with the statement “Modern science will solve our environmental problems with little change to our way of life,” the same item that reduces the reliability of the composite in both samples.

Table S2. Correlations for individual items with aversion to playing God (Archival Study 1b, Sample A).

Item	Correlation
“In general, do you think is a good or a bad idea to clone animals such as sheep?”	-.50
“Do you think that it is morally acceptable to clone animals such as sheep, or don’t you feel that way?”	-.53
“As you may know, scientists might one day be able to identify animals such as sheep, chickens, cows, and pigs which grow the fastest on the least amount of food and clone them in order to create large flocks of genetically identical animals, which would be less expensive for farmers to raise. Would you consider this a positive or a negative discovery?”	-.39
“Do you think you would or would not eat vegetables and fruits that are clones?”	-.36
“Do you think you would or would not eat meat from animals that are clones?”	-.47
“Which do you think is more likely--that the new cloning techniques will help solve some of the problems that the world faces, or that cloning will create more problems than it solves?”	-.43
“In general, do you think it is a good idea or a bad idea to clone human beings?”	-.21
“Do you think that it is morally acceptable to clone human beings, or don't you feel this way?”	-.24
“In general, would you consider it a good idea or a bad idea to clone not whole human beings, but body parts or vital organs for transplants that are needed as a result of accidents or disease?”	-.30
“Do you think you would or would not take part in a demonstration against the cloning of human beings?”	-.13
“In general, does the prospect of cloning human beings scare you, or not?”	-.26
If you had the chance, would you clone yourself, or, wouldn't you do that?	-.23

All correlations significant, $p < .001$.

Note: Negative correlations indicate aversion to playing God corresponds to disapproval of cloning procedures.

Table S3. Correlations for individual items with aversion to playing God (Archival Study 1b, Sample B).

Item	Correlation
“Do you think is a good or a bad idea to clone animals such as sheep?”	-.36
“In general, do you think it is a good idea or a bad idea to clone human beings?”	-.35
“Do you think each of the following justifies creating a human clone or don’t you think so?...To save the life of the person being cloned”	-.27
...To help infertile couples to have children without having to adopt”	-.26
...To produce copies of humans whose vital organs can be used to save the lives of others”	-.15
...To create genetically superior human beings”	-.15
...To allow parents to have a twin child at a later date if they wanted to”	-.19
...To allow parents who have lost a child to create a clone of the child they lost”	-.26
...To allow gay couples to have children using only their own genes”	-.21
“Do you think scientists should be allowed to clone human beings or don’t you think so?”	-.37
“If scientists could clone the following people, do you think they should do so?...Albert Einstein”	-.21
...Michael Jordan”	-.13
...Beethoven”	-.18
...Abraham Lincoln”	-.17
...Isaac Newton”	-.19
...Humphrey Bogart”	-.13
“If you had the chance, would you clone yourself, or, wouldn't you do that?”	-.20

All correlations significant, $p < .001$.

Note: Negative correlations indicate aversion to playing God corresponds to disapproval of cloning procedures.

Table S4. T-tests for APG participants vs. other-worry participants on individual items (Archival Study 1c).

Item	<i>t</i>
“In general, do you approve or disapprove of the use of genetic testing during pregnancy to find out whether the baby will develop a serious genetic disease?”	7.70
“Do you approve or disapprove of the use of genetic testing during pregnancy to find out whether the baby will have desirable characteristics such as strength or high intelligence?”	5.43
“In general, do you approve or disapprove of the use of in vitro fertilization?”	5.18
“Would you approve or disapprove if parents were offered a way to use P-G-D [preimplantation genetic diagnosis] to...Choose the sex of their child.”	6.68
“...Make sure their baby does NOT have a serious genetic disease.”	6.50
“...Make sure their baby has desirable characteristics such as high intelligence and strength.”	5.07
“...Make sure their baby does NOT have a tendency to develop a disease like cancer when he or she is an adult.”	5.57
“... Make sure their baby would be a good match to donate his or her blood or tissue to a brother or sister who is sick and needs a transplant.”	3.91
“Would you approve or disapprove if parents were offered a way to change their OWN genes in order to have children who would be smarter, stronger, or better looking?”	4.03
“Would you approve or disapprove if parents were offered a way to change their OWN genes in order to prevent their children from having a genetic disease?”	8.18
“Do you approve or disapprove of scientists working on ways to clone animals?”	11.54
“Do you approve or disapprove of scientists working on ways to clone humans?”	9.46

All *t*-tests significant, $p < .001$.

Note: All tests indicate APG participants vs. other-worry participants express greater disapproval of genetic procedures.

Table S5. Standardized betas for multiple regressions (Studies 2-7).

Study	outcome measure	playing God (perceptions of practices for Study 2; APG scale for Studies 3-6; conditions prompting recall of playing God for Study 7)	political ideology	religiosity	belief in God
2	moral acceptability – drone warfare	-0.25**	0.17**	0.07	-0.07
2	moral acceptability - GMOs	-0.40**	-0.03	-0.05	-0.13
2	moral acceptability - vaccines	-0.42**	-0.02	-0.12	0.03
2	moral acceptability – climate change	-0.17**	0.23**	0.04	-0.06
3	funding – NSF	-0.35**	0.07	-0.21*	0.22*
3	funding – Department of Defense	0.08	0.39**	0.04	-0.11
3	funding – Federal Prison System	0.05	0.02	0.06	0.02
4	donation – National Stem Cell Foundation	-0.24**	-0.11 ⁺	0.05	0.15
4	donation – Cure Violence	0.12	-0.08	0.09	0.04
5	donation – International Rice Research Institute minus Helen Keller International	-0.09	0.03	0.06	-0.11
6a	moral acceptability – established practice	-0.44**	-0.04	0.05	-0.09
6a	moral acceptability – novel practice	-0.44**	-0.05	0.04	-0.07
6b	moral acceptability – established practice (legal)	-0.07	0.09 ⁺	0.12	-0.06
6b	moral acceptability – novel practice (legal)	-0.15*	0.01	-0.01	0.02
6b	moral acceptability – established practice (science)	-0.38**	-0.04	-0.02	-0.03
6b	moral acceptability – novel practice (science)	-0.46**	0.003	0.004	-0.03
7	Scientific attitudes	0.09*	-0.12**	0.01	-0.11 ⁺

Notes: ⁺p<.09 *p<.05; **p≤.01.

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