

Online appendix for “Religious Identity and Economic Behavior”

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A. Scrambled sentences in the priming instrument

Control condition: (1) fall was worried she always; (2) shoes give replace old the; (3) retrace good have holiday a; (4) more paper it once do; (5) send I over it mailed; (6) saw hammer he the train; (7) yesterday it finished track he; (8) sky the seamless blue is; (9) predictable he shoes his tied; (10) prepared somewhat I was retired.

Possible unscrambled sentences are as follows: (1) she always was worried; (2) replace the old shoes; (3) have a good holiday; (4) do it once more; (5) I mailed it over; (6) he saw the hammer/train; (7) he finished it yesterday; (8) the sky is blue; (9) he tied his shoes; (10) I was somewhat prepared.

Religion-salient condition: (1) felt she eradicate spirit the; (2) dessert divine was fork the; (3) appreciated presence was imagine her; (4) more paper it once do; (5) send I over it mailed; (6) evil thanks give God to; (7) yesterday it finished track he; (8) sacred was book refer the; (9) reveal the future simple prophets; (10) prepared somewhat I was retired.

Possible unscrambled sentences are as follows: (1) she felt the spirit; (2) the dessert was divine; (3) her presence was appreciated; (4) do it once more; (5) I mailed it over; (6) give thanks to God; (7) he finished it yesterday; (8) the book was sacred; (9) prophets reveal the future; (10) I was somewhat prepared.

B. Categorization scheme for identity responses in prime validation experiment

Each identity response in Section III’s prime validation experiment was independently categorized by two research assistants, and conflicts were then resolved by the authors. Coders first attempted to place the response into one of the following categories: religion, gender, sexual orientation, age, student, nationality/ethnicity/

race/language, birthplace/hometown/place of residence, socioeconomic class, non-spousal family relationship, non-family non-romantic relationship, romantic relationship/status, athletics/sports, arts in general, specific work of non-religious art or artist, food or drink (excluding beer and liquor), partying/nightclubs/bars (including beer and liquor), clothing/fashion, environmentalism, leisure travel, pro-social personality trait, and human being. Responses that remained unclassified were placed into second-tier categories: political orientation, mental feature/personality trait, physical feature, professional interest/profession, non-professional interest/dislike/activity group/possession. Any responses that still could not be classified were placed into a third-tier “other” category.

C. Differential efficacy of the prime by religious and demographic group

In Section III’s validation experiment, priming increased the likelihood that Catholics mention a religious identity as a top-five identity by 7.2 percentage points and the likelihood that Protestants do the same by 6.6 percentage points. We also find that primed subjects were 3.8 percentage points more likely than unprimed subjects to report themselves as Protestant and 4.1 percentage points less likely to report themselves as Catholic.

If we interpret these changes in self-reported religious affiliation to be a causal effect of the prime, then simply comparing, say, primed subjects who identify themselves as Catholic to unprimed subjects who identify themselves as Catholic can provide a misleading picture of how effective the prime is at making religious identity salient for Catholics. As we explain in Section III, we believe the changes in self-reported religious affiliation that we observe are more likely to be due to sampling variation than to a causal effect. Nonetheless, in order to calibrate the magnitude of the potential problem, here we assume (contrary to what we believe) that all of the changes represent a causal effect, and we calculate bounds on how effective the prime is at making religious identity a top-five identity for a “true” Catholic—someone who would report a Catholic affiliation in the absence of a prime.

We will assume that the prime causes some Catholics to report themselves as Protestants but not vice versa. In addition, we will assume that the prime does not cause

Christians to report themselves as non-Christians, and vice versa (i.e., we assume that the difference between the 45.7% frequency of Catholics plus Protestants in the treatment group and the 46.0% frequency in the control group is due to sampling noise). Thus, in our calculations, we will normalize subject counts in each experimental condition by the total number of Catholics and Protestants in the same experimental condition. In the treatment group, 33.7% of Christians—a term we will use hereafter to mean Catholics plus Protestants—report themselves to be Catholic, whereas 42.4% do in the control group, implying that 8.7% of Christians flip from reporting themselves as Catholic to reporting themselves as Protestant when primed.

We explore two extreme cases. In the first, we assume that every true Catholic who reports being a Protestant when primed also reports a religious identity as a top-five identity when primed. This assumption maximizes the calculated efficacy of the prime for Catholics and minimizes it for Protestants. We add the 11.2% of primed Christians who are self-reported Catholics and report a religious identity in their top five to the 8.7% of Christians who are flippers and assumed to report a religious identity in their top five to get a 19.9% estimate of Christians who are true Catholics who report a religious identity in their top five when primed. This is $19.9\% \div 42.4\% = 46.9\%$ of true Catholics. Comparing this 46.9% number to the 26.1% of Catholics in the control condition who report a religious identity in their top five yields an upper bound on the Catholic priming effect of $46.9\% - 26.1\% = 20.8\%$.

In the second case, we assume that no true Catholic who reports being a Protestant when primed reports a religious identity as a top-five identity when primed. This assumption minimizes the calculated efficacy of the prime for Catholics and maximizes it for Protestants. Then $11.2\% \div 42.4\% = 26.5\%$ of true Catholics report a religious identity in their top five when primed, which corresponds to a 0.4% Catholic priming effect.

We now calculate bounds on the Protestant priming effect. We know that 31.5% of primed Christians are self-reported Protestants who list a religious identity in their top five. But 8.7% of primed Christians are true Catholics who self-report as Protestants when primed. In the first case, we assume that all of these flippers list a religious identity in their top five when primed, so $31.5\% - 8.7\% = 22.9\%$ of primed Christians are true

Protestants who list a religious identity in their top five, which corresponds to $22.9\% \div 57.6\% = 39.7\%$ of true Protestants. Comparing to the 41.0% of Protestants in the control group who list a religious identity in their top five, we calculate a lower bound on the Protestant priming effect of $39.7\% - 41.0\% = -1.3\%$. If, on the other hand, none of the flippers list a religious identity in their top five when primed, then 31.5% of primed Christians are true Protestants who list a religious identity in their top five. This corresponds to $31.5\% \div 57.6\% = 54.8\%$ of true Protestants, which yields an upper bound on the Protestant priming effect of $54.8\% - 41.0\% = 13.8\%$.

In summary, even under the most pessimistic assumptions, the priming effect for Protestants and Catholics is either positive or only slightly negative. The upper bound on the Catholic priming effect is considerably larger than the upper bound on the Protestant priming effect, perhaps indicating that the prime is more effective on Catholics.

To provide further descriptive evidence on the apparent effect of priming on reported religious affiliation, we examine whether the prime causes any demographic group to be especially more or less likely to report themselves as Protestant or Catholic. It does not appear to. The first column of Online Appendix Table 2 shows OLS regression coefficients where the dependent variable is a dummy for reporting oneself as Protestant. The explanatory variables are a religious-unscramble treatment dummy, a dummy for full-time-student status, age, log income (using the midpoints of the income range chosen by the subject and \$200,000 for those who chose “above \$200,000”; students were asked to report parental income), and treatment interactions with the demographics. None of the interactions are significant, and the p -value on the null hypothesis that all the interactions are jointly zero is 0.265. The second column shows the same regression for reporting oneself Catholic; the p -value on the null hypothesis that all the interactions are jointly zero is 0.308.

We also test whether the priming effect varies by student status, age, and log household income (log parental income for full-time students). Online Appendix Table 3 shows coefficients from regressing a dummy for whether religion appears as a top-five identity on a religion-salient treatment dummy, demographics, and demographic interactions with the treatment dummy. We find that higher-income individuals are more likely than lower-income individuals to mention religion when unprimed, but there is a

negative income \times treatment interaction effect that is significant at the 1 percent level, indicating that the prime increases religion mentions more for lower-income individuals. Interactions with age and student status are insignificant.

D. Does the religious prime disproportionately crowd out certain identity categories?

Because subjects in Section III's validation experiment mention religious identities more frequently when primed, and only five identities could be listed, it is necessarily true that primed subjects listed non-religious identities less frequently. Is there any identity that is disproportionately likely to be displaced? Of the 26 non-religious identity categories we examined, we find that only identities in one category—age—garnered significantly fewer mentions under the prime (12.2 percent in the control group versus 8.5 percent in the primed group, $p = 0.010$), which is about what one would expect by chance. The apparent age effect is concentrated exclusively among agnostics and atheists ($p = 0.002$); for Catholics, Protestants, and Jews, the point estimate of the effect is not always negative and the p -value is 0.195 or above.

E. Does the religious prime cause people to move away from their category norm?

It is conceivable that making religious identity salient could cause somebody who rejects the norms of the religious identity to move even further away from that category's norms. To test the prevalence of such an effect in Section III's validation experiment, we asked subjects on the screen following the elicitation of top-five identities (and before the demographics screens): "Groups often have norms about how people who belong to them *should* behave. Are there any groups you belong to whose norms you reject? (These may or may not be among the five groups you listed on the last page.)" Subjects could click buttons labeled, "No, I don't belong to any groups whose norms I reject," or "Yes, I do belong to some groups whose norms I reject." Those who chose the latter option were asked to list the rejected groups.

In our data, only 4.7 percent of subjects from our four main religious classifications said that they rejected the norms of *any* identity category they belonged to (religious or non-religious), suggesting that negative priming effects, if they occur at all, are rare. Interpreting the listing of a rejected identity as signifying that the subject puts negative weight on that identity's norms and that the rejected identity is salient, we

construct an alternative dependent variable for testing the net effectiveness of the priming instrument at increasing the strength of affiliation with religious identity: the fraction of people who mentioned a religious identity in their top five minus the fraction of people who mentioned a religious identity as a rejected identity. Adopting this alternative dependent variable does not change the conclusion that the prime successfully increases the perceived importance of religious identity: the p -value of the treatment effect is 0.043 for the entire sample and 0.025 for Catholics and Protestants combined.

F. Other priming validation experiments we ran

In keeping with best practices of scientific disclosure, we discuss here other experiments we ran in order to test the efficacy of the priming instrument which are not reported in the main text.

In Spring 2008, we recruited 91 students at the University of Michigan in student dining halls. Forty-seven percent of subjects in the religion-salient condition listed a religious identity in their top five, compared to only 25 percent of subjects in the control condition ($p = 0.031$). However, we did not collect these subjects' religious affiliations. In response to referee reports, we ran a follow-up experiment that collected religious affiliations.

In Fall 2012, we recruited 1,301 Cornell University students who were walking by tables manned by research assistants. Although the priming effect's point estimate in this sample is in the expected direction, the effect is not significant (17.9 percent mentioned a religious identity in the control group versus 19.9 percent in the primed group, $p = 0.359$). We subsequently ran—and report in the main text—the Yale/Mechanical Turk experiment because we believe that the data from this Cornell experiment are of low quality: for a stretch in the middle of the experiment, only control sentence unscrambles were distributed by mistake (which could introduce bias if certain types of students were more likely to pass by our tables at that time); the research assistants told us that it was impossible to prevent subjects from talking to each other in the chaotic environment where the subjects completed the task; and some top-five identity lists that were submitted close in time to each other were nearly identical, indicating that cross-subject contamination may have been substantial. The overall frequency of mentioning religion is

much lower in the Cornell sample than in the Yale/Mechanical Turk sample, perhaps because the Cornell experimental instructions gave “male/female” and “college student” as examples of identities, which probably explains why in that sample, 80 percent of subjects listed gender and student among their top five identities. We did not provide example identities in the Yale/Mechanical Turk experiment.

Recall that the Yale/Mechanical Turk experiment found evidence that could be interpreted as the prime causing shifts in reported religious affiliations. In Summer 2013, we ran another prime validation experiment on 1,788 subjects recruited on Mechanical Turk in order to see if the prime would shift religious affiliations in this new sample. There was no significant difference in the distribution of religious affiliations between the treatment and control groups ($p = 0.391$), but we view this as having little evidentiary value because there was also no significant difference between the treatment and control groups in the frequency with which a religious identity was listed in the top five (28.1% of treated vs. 28.0% of control, $p = 0.963$). This null result is actually consistent with what we show in Panel B of Online Appendix Table 1: there is also no significant priming effect ($p = 0.845$) among the MTurk subjects in our main priming validation sample. All of the priming effect comes from the Yale eLab subjects ($p = 0.009$).

We do not know why we find no effect among MTurk subjects, but we suspect it may be due to their being too distracted or rushed while doing the priming task. Ipeirotis (2010) and Chandler et al. (2014) document that MTurk workers often complete large volumes of tasks while multitasking. In contrast, there are typically only one or two studies available for Yale eLab subjects to participate in on any given day. Many eLab subjects were recruited from the Yale student body and other northeastern college campuses (in addition to Google AdWord online advertisements), and they join the subject pool knowing that they will be participating in Yale scientific studies.¹ Therefore, they are likely to be a more conscientious subject pool that engaged with our experiment more seriously. We also note that the overrepresentation of college students in the eLab pool makes it more comparable to the Cornell student sample in our main experiment.

¹ Unfortunately, no statistics are available on what fraction of eLab subjects are Yale students.

Online Appendix Table 1. Prime Validation Experiment Results

Panel A: Combined sample (% mentioning a religious identity in their top 5)					
	Protestant	Catholic	Jewish	Agnostic/Atheist	All
Religion-salient	47.6%	33.3%	58.7%	11.1%	29.9%
Control	41.0%	26.1%	67.4%	10.0%	25.1%
<i>p</i> -value of difference	0.135	0.164	0.396	0.669	0.023
<i>N</i>	510	314	89	570	1,798
Panel B: Yale eLab sample (% mentioning a religious identity in their top 5)					
	Protestant	Catholic	Jewish	Agnostic/Atheist	All
Religion-salient	48.4%	36.1%	61.1%	8.7%	31.2
Control	40.0%	27.8%	64.1%	3.6%	24.4
<i>p</i> -value of difference	0.114	0.186	0.788	0.056	0.009
<i>N</i>	351	223	75	318	1,192
Panel C: MTurk sample (% mentioning a religious identity in their top 5)					
	Protestant	Catholic	Jewish	Agnostic/Atheist	All
Religion-salient	45.9%	26.8%	50.0%	14.2%	27.5
Control	43.2%	22.0%	100.0%	18.2%	26.7
<i>p</i> -value of difference	0.733	0.595	0.078	0.391	0.845
<i>N</i>	159	91	14	252	606

Online Appendix Table 2. Priming Effect Interactions with Demographics on Whether Participants Report Themselves to be Protestant or Catholic

	Report Protestant	Report Catholic
Treatment	-0.037 (0.267)	-0.166 (0.229)
Full-time student	-0.087* (0.040)	0.046 (0.034)
Age	0.003* (0.001)	0.004** (0.001)
log(Income)	0.018 (0.017)	0.007 (0.015)
Full-time student × Treatment	0.022 (0.056)	-0.045 (0.048)
Age × Treatment	0.003 (0.002)	-0.003 (0.002)
log(Income) × Treatment	-0.005 (0.024)	0.021 (0.021)
Constant	-0.015 (0.187)	-0.026 (0.160)

* Significant at 5% level. ** Significant at 1% level

Online Appendix Table 3. Priming Effect Interactions with Demographics on Whether Religious Identity Is Listed As a Top-Five Identity

Treatment	0.620* (0.268)
Full-time student	-0.039 (0.040)
Age	0.001 (0.001)
log(Income)	0.037* (0.170)
Full-time student × Treatment	0.030 (0.057)
Age × Treatment	0.003 (0.002)
log(Income) × Treatment	-0.065** (0.024)
Constant	-0.156 (0.188)

* Significant at the 5% level. ** Significant at the 1% level.

References

Chandler, Jesse, Pam Mueller, and Gabriele Paolacci, 2014. "Nonnaivete among Amazon Mechanical Turk workers: Consequences and solutions for behavioral researchers." *Behavioral Research Methods* 46: 112-130.

Iperotis, Panos, 2010. "Demographics of Mechanical Turk." New York University working paper.