# Behavioral Based SocioEconomic Policies: New Dataset on Behavioural Regional Parameters

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**Abstract**

This study develops a novel regional behavioural dataset for Greece by combining survey-based measures, web-scraped text corpora, and machine learning techniques. We analyse films, commercial music, folk music, and regional newspapers to construct preference indicators related to religion, family orientation, gender norms, politics, environment, trust, risk-taking, patience, individualism and collectivism, as well as views on immigrants. We link cultural content to writers' and creators' regions of origin and validate our indicators using the World Values Survey (WVS), Global Preferences Survey (GPS), and a newly conducted nationwide behavioural survey. Using principal component analysis, we construct composite regional indices and interpret spatial patterns across all NUTS3 regions. We conclude with implications for labour markets, youth unemployment, education, migration, and regional economic policy. Also, we provide a research article that we used the data from our survey entitled " Nudges and the Malleability of Identity: Evidence from Religiosity" so as the reader to better understand the methods and the data of WP1.

# 1 Introduction

Understanding behavioural heterogeneity across regions is fundamental for designing modern socio-economic policies. Traditional surveys such as the World Values Survey (WVS) and the Global Preferences Survey (GPS) provide valuable insights, yet they remain costly, infrequent, and limited in granularity. Most importantly, they often capture static snapshots rather than evolving cultural dynamics.

This project addresses these limitations by developing the first comprehensive behavioural dataset for all Greek regions using three complementary methodologies: (i) large-scale text analysis of cultural and media content, (ii) a newly fielded behavioural survey including aspirations and status concerns, and (iii) validation with international survey benchmarks. We analyse 1480 movies, 109,989 commercial songs, 2034 local songs, and over 157,000 newspaper articles, generating dynamic regional indicators that capture deep-rooted cultural patterns.

Our approach allows for measuring behavioural traits that are typically unobserved in administrative or economic data, including patience, trust, individualism, and gender biases. These behavioural traits matter for labour market participation, educational outcomes, migration decisions, entrepreneurship, and long-run productivity.

# 2 Deliverables Summary

In this part our main goal was to develop a unique dataset of behavioural variables at a regional level (NUTS level 3). In particular, our aim was to collect data on socio-economic preferences such as a) preferences for socioeconomic status, b) preferences for interpersonal trust for natives and immigrants (highly important issues related to social inclusion), c) rate of time preference (appropriate for any issue that has time dimension and time planning), d) risk taking, e) educational perceptions, f) preferences for gender equity, g) preferences for inequality. Our final objective was to create deep routed behavioural indexes for a non-exhaustive use in a set of other applications in social sciences.

Our method was the following:

a) Integrating all data sources through principal component analysis (PCA), we construct composite preference indices for each NUTS3 region, enabling a rich spatial understanding of cultural variation.

b) We have conducted our own survey data involving 1500 individuals (more than what we have promised to deliver) where most variables have been validated with experimental data of previous studies and our experiments (see WP2.1)

c) We designed a website that we have available for other researchers and free of use the regional regional preferences around Greek regions

d) As an example of how our data can be used we have written a research paper on the role of nudges to change religiosity identity.

e) We have produced a virtual reality game of financial literacy and patience as an innovative method that someone can experience and understand the outcomes of our paper.

f) Codes and Aggregated Data are provided in the website

The remainder of this article discusses the data, methodology and the composite indices. All maps can also be found on the dedicated website. Please note that in the website we upload only the aggregated data at NUTS3 level for GDPR reasons.

# 3 Data Sources

The project builds a multi-layered dataset from four domains of cultural expression: movies, newspapers (as a indication of local social media that cannot exist), commercial music, and local folk music. These sources collectively reflect the cultural, ideological, and emotional landscapes of Greek society.

## 3.1 Movies

We analyse 1480 films written by 1643 writers. Each writer is probabilistically assigned to regions based on surname distribution across prefectures. This allows us to infer regional behavioural tendencies embedded in film narratives.

## 3.2 Newspapers

The dataset includes 157,442 articles from 112 regional and national newspaper websites. Newspaper language reflects local concerns, cultural priorities, institutional trust, and political polarisation.

## 3.3 Commercial Songs

From 109,989 songs written by 4626 lyricists, we extract emotional and behavioural linguistic content. Songs strongly reflect social norms, relationships, religion, and collective identity.

### 3.4 Local Songs

We incorporate 2034 traditional songs that capture historical and deeply rooted cultural values specific to regions.

### 3.5 Survey Data

Survey data from the World Values Survey, the Global Preferences Survey and our Own Survey.

## 4 Text Analysis Methodology

We define the following behavioural and cultural concepts: religion, family, politics, environment, gender bias, individualism, collectivism, immigrants, trust, risk-taking, and patience. For each concept, we construct word lists using both LIWC (a validated psycholinguistic tool) and custom expansions via ChatGPT. We also perform topic modelling.

For every text (movie script, song lyric, or article), we compute the relative frequency of concept-associated words:

$$\text{Frequency}_{c,i} = \frac{\text{Count of concept words in document } i}{\text{Total words in document } i}$$

Regional indices are then calculated as weighted averages of the content associated with creators linked to each region.

## 5 Survey Measures (WVS and GPS)

To validate our text-based indices, we correlate them with two international surveys and our own behavioural survey.

### 5.1 World Values Survey (WVS)

WVS includes measures on:

- Religion (importance of religion, belief in God, religious faith for children, science vs. religion)
- Family importance
- Political interest

- Environmental attitudes
- Trust in strangers
- Gender norms (working mothers, leadership, education, executive capability)
- Independence and collectivism
- Attitudes toward immigrants

These variables are matched to regional distributions using survey sampling weights.

## 5.2 Global Preferences Survey (GPS)

GPS measures:

- Patience
- Risk-taking
- Trust
- Positive and negative reciprocity
- Altruism

GPS provides continuous behavioural indices which we compare to concept frequencies in text data.

## 5.3 Our own survey

We run a survey for 1543 individuals (543 more than the estimated number of this deliverable) that has been tested to be representative with data validated with experiments. Below we report the descriptive statics

Table 1: Descriptive Statistics of Numerical Variables

| | count | mean | std | min | 25 | 50 | 75 | max |
|---|---|---|---|---|---|---|---|---|
| age | 1543.000000 | 28.616000 | 12.407000 | 13.000000 | 20.000000 | 23.000000 | 33.000000 | 78.000000 |
| ImportanceGOD | 1407.000000 | 5.497000 | 3.540000 | 0.000000 | 2.000000 | 6.000000 | 9.000000 | 10.000000 |
| RegretDifficulty | 1407.000000 | 4.425000 | 2.322000 | 0.000000 | 3.000000 | 4.000000 | 6.000000 | 10.000000 |
| AbortionJustified | 1349.000000 | 7.058000 | 3.124000 | 0.000000 | 5.000000 | 8.000000 | 10.000000 | 10.000000 |
| PreMaritalSexJustified | 1354.000000 | 9.099000 | 2.220000 | 0.000000 | 10.000000 | 10.000000 | 10.000000 | 10.000000 |
| HomophiliJustified | 1331.000000 | 7.543000 | 3.360000 | 0.000000 | 5.000000 | 10.000000 | 10.000000 | 10.000000 |
| RevengeUnfair | 1352.000000 | 4.503000 | 2.787000 | 0.000000 | 2.000000 | 5.000000 | 7.000000 | 10.000000 |
| RevengeAction | 1110.000000 | 4.555000 | 2.462000 | 0.000000 | 3.000000 | 5.000000 | 6.000000 | 10.000000 |
| Immigrants | 1343.000000 | 4.739000 | 2.841000 | 0.000000 | 2.000000 | 5.000000 | 7.000000 | 10.000000 |
| Gender Bias | 1343.000000 | 5.109000 | 2.717000 | 0.000000 | 3.000000 | 5.000000 | 7.000000 | 10.000000 |
| RistTaking | 1343.000000 | 5.238000 | 3.671000 | 0.000000 | 2.000000 | 6.000000 | 8.500000 | 10.000000 |
| Comparisons | 1504.000000 | 5.175000 | 2.668000 | 0.000000 | 3.000000 | 5.000000 | 7.000000 | 10.000000 |
| Patience | 1508.000000 | 6.860000 | 2.173000 | 0.000000 | 5.000000 | 7.000000 | 8.000000 | 10.000000 |

In the article below we report more on the methogology of the survey and how it can be uses in social sciences.

# 6 Example of Regional Validation

This is section, we provide an example of how the dataset has been validated using our data from movie-based indicators and WVS responses.

## 6.1 Religion

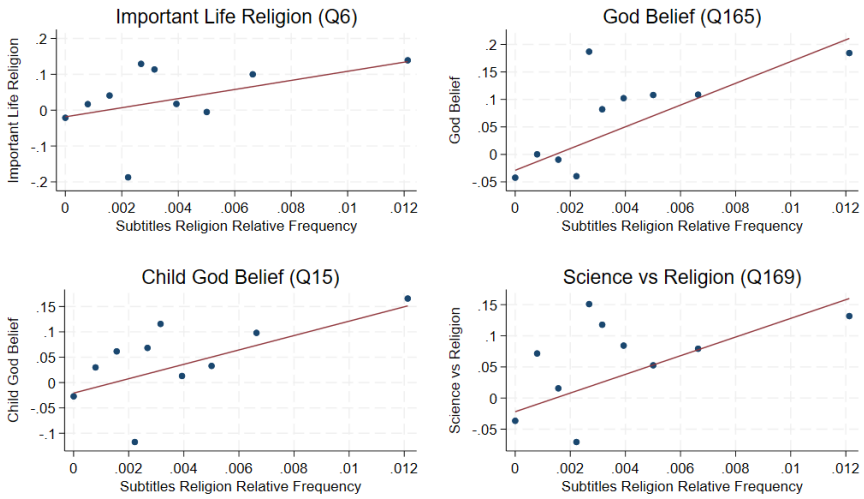


Figure 1: Correlation between Movie-Based Religion Index and WVS Religion Variables

A strong positive association emerges between religious content in movies written by regional authors and religion-related WVS responses. Regions with higher religious representations in films tend to exhibit higher belief in God, higher importance of religion, and stronger preferences for religious education in children.

## 6.2 Other WVS Dimensions

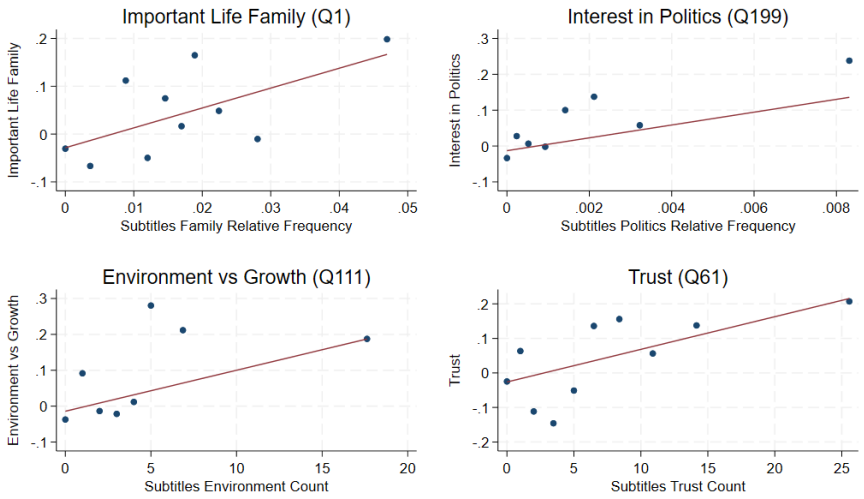


Figure 2: Correlations for Family, Political Interest, Environment, Trust

Family-related content in movies correlates positively with the importance of family in WVS. Political themes correlate with political interest, and linguistic content related to trust corresponds well with WVS trust measures.

## 6.3 Gender Bias

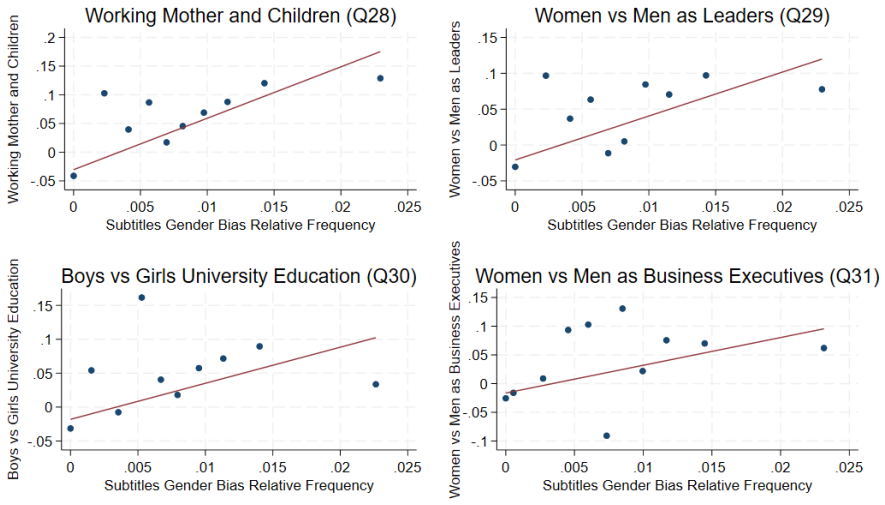


Figure 3: WVS Gender Bias Indicators and Movie-Based Measures

Higher gender bias linguistic markers in films are associated with more traditional gender attitudes in WVS responses.

## 6.4 Individualism and Collectivism

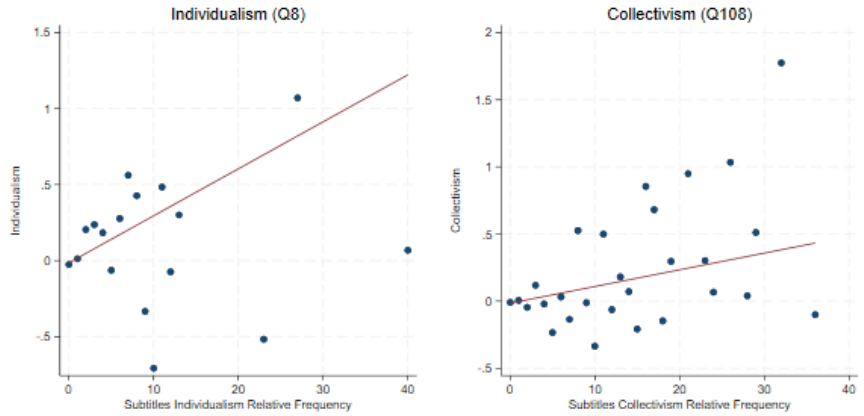


Figure 4: Individualism–Collectivism Patterns Across Regions

Movies from Northern and Western Greece display higher collectivist linguistic signals, consistent with WVS responses.

## 6.5 Immigrants

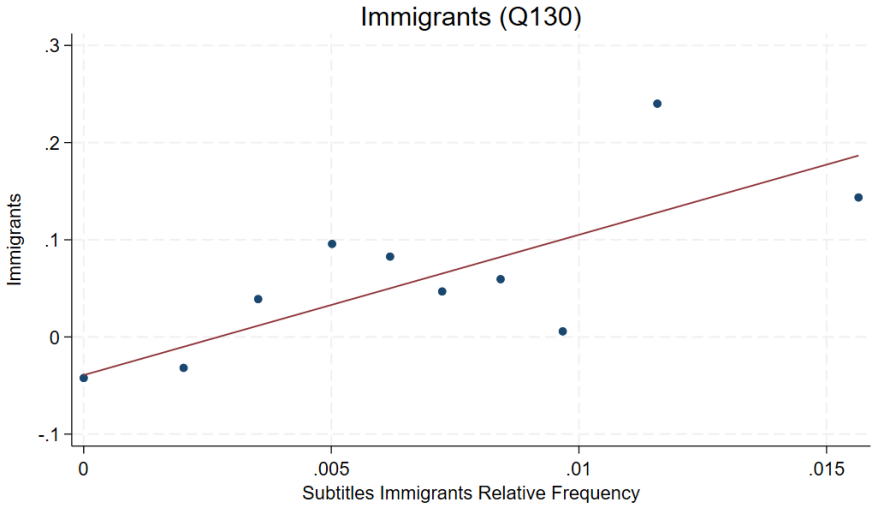


Figure 5: Attitudes Toward Immigrants in Movies vs. WVS

Regions where films portray immigrants with neutral or positive framing tend to score more positively on immigrant acceptance.

### 6.6 GPS Correlations

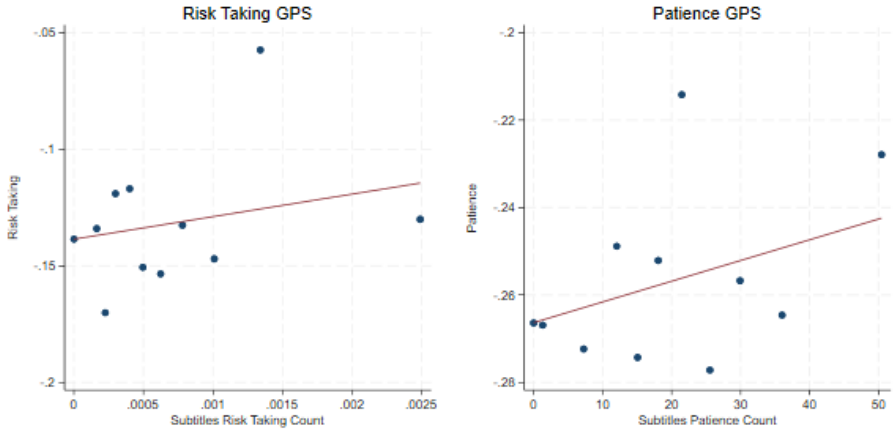


Figure 6: GPS Correlations (Patience, Trust, Risk-Taking)

Patience and risk-taking show particularly strong correlations with corresponding linguistic content.

## 7 Composite PCA Index

Composite indices for each concept are created using PCA:

$$\text{Index} = w_1 \cdot \text{Movies} + w_2 \cdot \text{Commercial Songs} + w_3 \cdot \text{Newspapers} + w_3 \cdot \text{Stories}$$

where $w_i$ are loadings from the first principal component.

Below we provide example of maps with some interpretations for each behavioural dimension. The user of the socioeoconomicslab.com website will be able to see other variables of the dataset.

## 7.1 Religion and Family

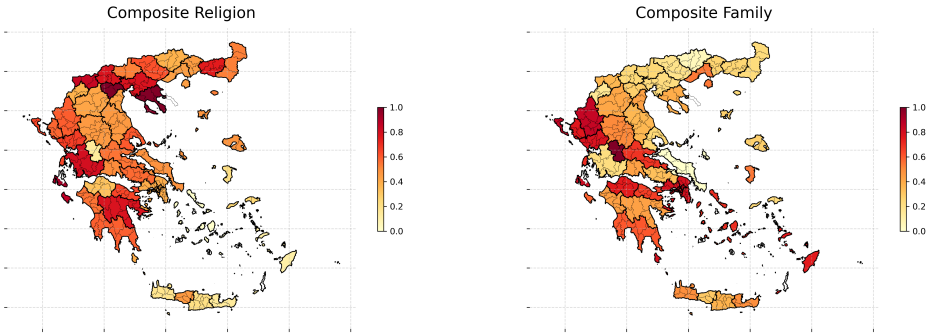


Figure 7: Composite Religion and Family Indices

Religious values are strongest in Epirus, the Peloponnese, and select Aegean regions. Family orientation is uniformly high but peaks in Crete and the Ionian Islands, reflecting traditional kinship structures.

## 7.2 Politics and Immigrants

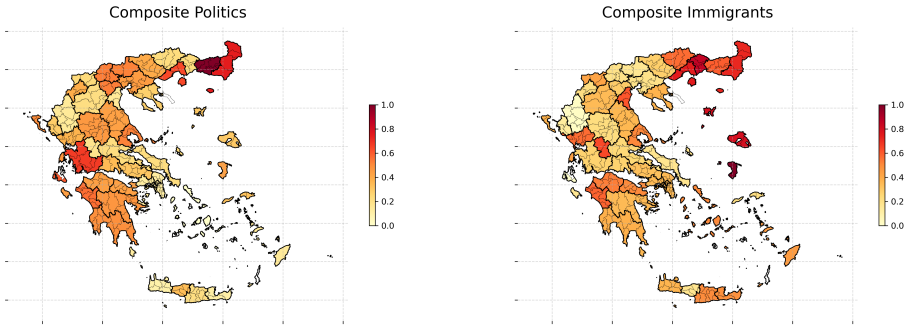


Figure 8: Political Interest and Attitudes Toward Immigrants

Political interest is highest in Attica and Central Macedonia. Acceptance of immigrants is higher in urban areas, coastal regions with tourism exposure, and parts of Crete.

## 7.3 Environment and Gender Bias

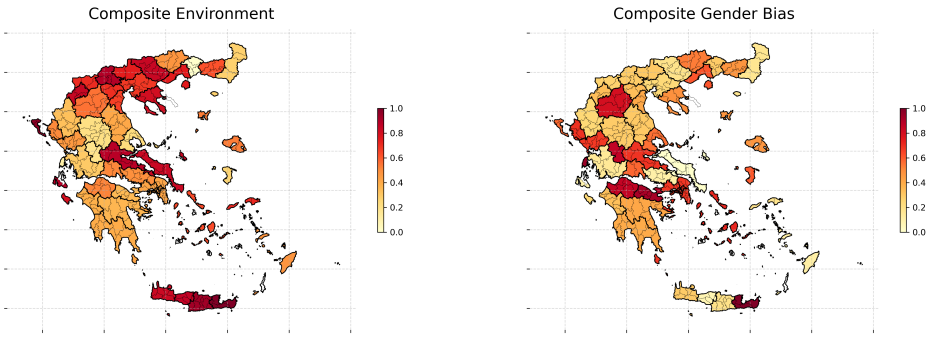


Figure 9: Environmental Preferences and Gender Bias

Environmentally sensitive regions include the Northern Aegean and the Ionian islands. Gender bias remains stronger in rural mainland areas, particularly in Western Macedonia and Thessaly.

## 7.4 Individualism and Collectivism

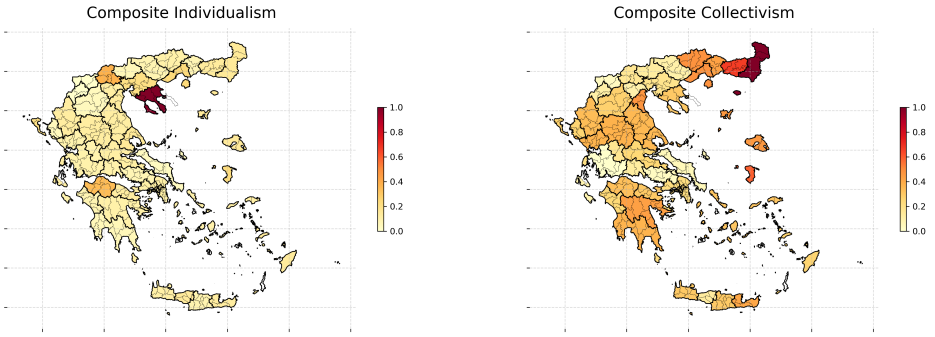


Figure 10: Individualism and Collectivism Across Regions

Attica appears the most individualistic, while collectivism peaks in Epirus, Western Macedonia, and rural Peloponnese.

## 7.5 Risk-Taking and Patience

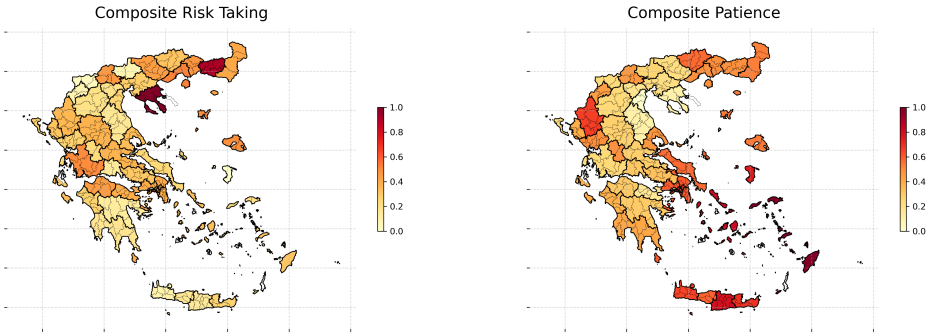


Figure 11: Risk-Taking and Patience Patterns

Patience is high in Crete and the Northern Aegean, with relatively lower values in Western Greece. Risk-taking is highest in major urban centres.

## 7.6 Trust

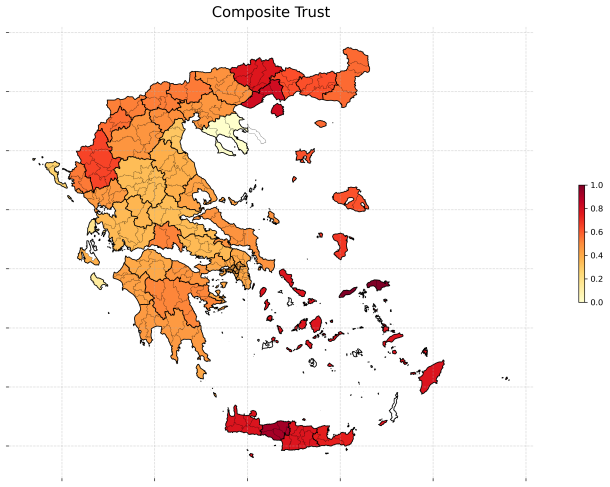


Figure 12: Composite Trust Index

Trust is highest in islands (Cyclades, Dodecanese) and lowest in inland mountainous areas.

# 8 Policy Implications

Our findings provide novel insights into how behavioural traits shape regional socio-economic outcomes.

## 8.1 Labour Markets and Youth Unemployment

Regions with higher patience and trust exhibit:

- greater long-term labour force attachment
- reduced NEET rates
- more stable employment trajectories

Policies should focus on:

- career guidance programmes tailored to local behavioural traits
- regional skill-building aligned with risk-taking and aspiration levels
- targeted interventions in low-trust regions

## 8.2 Education and Aspirations

Family-oriented and collectivist regions may benefit from:

- school-based aspiration-raising interventions
- mentoring and role model programmes

## 8.3 Migration

Regions with high risk tolerance see higher outward migration. Thus:

- local economic development should channel risk-taking into entrepreneurship
- targeted return-migration incentives may reduce brain drain

## 8.4 Gender Inequality

Regions with higher gender bias require:

- tailored gender equality programmes
- female entrepreneurship and STEM initiatives

## 8.5 Environmental Policy

Environmentally-conscious regions show readiness for green policies. Policymakers should prioritise:

- renewable energy programmes
- circular economy initiatives

To sum up, this study offers a novel, dynamic, and regionally disaggregated picture of behavioural traits across Greece by combining large-scale text analytics, international survey validation, and a unique behavioural survey. The resulting dataset reveals substantial heterogeneity across Greek regions in religion, gender norms, trust, risk-taking, patience, environmental preferences, and attitudes toward immigrants.

The integration of multiple cultural sources—movies, commercial songs, local folk music, and newspapers—provides a powerful tool for understanding how deeply rooted behaviours influence labour markets, education, migration, and regional development. The composite indices and maps offer policymakers a new evidence base for designing tailored and effective behavioural-based socio-economic policies.

The agreegated data are in the website socioeconomicslab.com

Its follows a research article that we wrote and we used the data from our survey entitled " Nudges and the Malleability of Identity: Evidence from Religiosity". This way we provide the reader a ways to understand the methods and the data this working package.

# Nudges and the Malleability of Identity: Evidence from Religiosity*

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Tommaso Sartori

October 2025

**Abstract**

Nudges are widely used to shape choices, yet their capacity to move deeply rooted aspects of identity such as religiosity remains largely unknown. We present evidence from a survey-based pre-registered randomized experiment in which we test whether brief prosocial messages—framed in either religious or scientific language—can shift religiosity. Participants were randomly assigned to one of three arms: a religious nudge drawing on biblical teachings, a scientific nudge grounded in psychological research, or a no-message control. Despite conveying the same prosocial content, only the scientific framing

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reduced self-reported religiosity relative to control; the religious framing had no detectable effect. Heterogeneity analyses show that the reduction under the scientific frame is concentrated among respondents with very high baseline religiosity, with near-zero effects for others. Complementary data from the World Values Survey, the epigraphic corpus, and the clergy registry support the validity of our religiosity measure. These findings provide causal evidence of the malleability of identity in response to subtle, low-cost interventions and the asymmetric power of scientific versus religious narratives in influencing belief systems.

**Keywords:** nudges, malleability of identity, religiosity, belief formation, secular vs. religious messages, prosocial behavior

**JEL Codes:** Z12, D83, C93

**Significance Statement**

Religious commitment is often treated as fixed. We show that it can shift at the margin depending on how prosocial ideas are framed. In a pre-registered randomized trial, participants read short prosocial messages identical in content but attributed either to science or to religion. Only the scientific framing reduced self-reported religiosity; the religious framing left beliefs unchanged. The effect was concentrated among highly religious respondents, revealing an asymmetric form of narrative persuasion in which scientific authority moves identity-relevant beliefs while parallel religious cues do not. These findings provide rare causal evidence that even core aspects of identity can be influenced by low-cost, context-specific interventions. They contribute to debates on attitude change and science communication, which highlights the ethical responsibility involved in messaging around sacred values.

# Introduction

Religiosity—an individual's degree of religious belief, practice, and identification—constitutes a fundamental dimension of human identity, shaping moral values, social norms, political attitudes, and economic behaviors worldwide (Iannaccone, 1998; McCleary & Barro, 2006; Putnam & Campbell, 2010; Stark & Finke, 2000). Rooted deeply in culture, tradition, and personal experience, religious identity is often considered stable over time and resistant to transient influences (Akerlof & Kranton, 2000; Bénabou & Tirole, 2011; Voas & Crockett, 2005). Yet religiosity is only one example of a broader class of deeply rooted identities, alongside nationalism, political ideology, and partisanship, that are thought to anchor individuals' worldviews and guide behavior. Understanding whether such identities are malleable—and how they may shift in response to subtle contextual cues—remains a critical question in the social and behavioral sciences.

In economics, religiosity has been linked to a variety of outcomes, including labor supply, consumption patterns, and social capital formation (Arruñada, 2010; Becker & Woessmann, 2009; Gruber, 2005; Guiso, Sapienza, & Zingales, 2006). Because many studies rely on observational data, identifying causal relationships or short-term identity dynamics is often difficult (Bentzen, 2019; Guiso, Sapienza, & Zingales, 2006; McCleary & Barro, 2006; Norris & Inglehart, 2011; Voas, 2009). This gap is especially important given the growing recognition in behavioral economics that identity plays a central role in shaping preferences and choices (Bursztyn & Jensen, 2015; Chen & Li, 2009; Cinnirella, Della Lena, Manzoni, & Panebianco, 2025; DellaVigna, 2009; Falk & Szech, 2013). If even the most durable aspects of identity can be influenced

by external framings or nudges, then their downstream consequences for economic and social behavior may be more context-dependent than previously assumed.

Behavioral economics and policy design increasingly employ nudges—small, low-cost, non-coercive interventions designed to steer individual choices without restricting freedom (Thaler & Sunstein, 2008). Nudges have been widely applied in domains such as health (Chapman, Li, Colby, & Yoon, 2010; Hollands, Marteau, & Michie, 2013; Milkman, Beshears, Choi, Laibson, & Madrian, 2011), savings (Beshears, Choi, Laibson, & Madrian, 2013; Chetty, Friedman, Leth-Petersen, Nielsen, & Olsen, 2014; Thaler & Benartzi, 2004), and environmental behaviors (Allcott, 2011; Allcott & Rogers, 2014; Ferraro & Price, 2013; Yoeli, Hoffman, Rand, & Nowak, 2013), self-control problems such as procrastination (Ariely & Wertenbroch, 2002; Kaur, Kremer, & Mullainathan, 2015; O'Donoghue & Rabin, 1999), and have recently been tested at scale through randomized trials using crowdsourced or institutional design approaches (DellaVigna & Linos, 2022; Paley & van de Ven, 2023). Yet their potential to shape deeply rooted belief systems remains largely unexplored. Existing research on religiosity and identity has relied predominantly on correlational evidence, leaving unanswered whether subtle interventions can causally shift self-perceptions of identity and belief. Addressing this question offers insights not only for the economics of religion but also for the broader literature on identity malleability.

This study bridges these strands of the literature by experimentally testing whether brief prosocial nudges framed either in religious or scientific language (compared with a control that was not exposed to a nudge) can shift self-reported religiosity. Specifically, we investigate whether messages invoking biblical teachings attributed to Jesus Christ versus sci-

entific insights into human social connectedness differentially influence religious self-concept. Both messages convey a common theme—emphasizing the importance of caring for others—but frame it through distinct linguistic and cultural lenses. We conduct a large-scale online randomized controlled trial that randomly exposes participants to different framings (nudges). This design isolates the causal effect of framing on self-reported religiosity, providing evidence that a deeply rooted identity can be malleable (Bénabou & Tirole, 2011; Carpenter, Conklin, & Schmidt, 2017).

We utilize original data collected through a survey-based online experiment conducted via the Qualtrics platform. The survey was disseminated to participants from June 2024 until September 2025, targeting adult participants in Greece. Qualtrics is a widely used online platform for social science experiments that allows for rapid recruitment and implementation of randomized interventions with demographic screening and quality controls (Coppock, 2019; Gillespie-Smith, Goodall, et al., 2025; Gu, Miller, et al., 2020; Mullinix, Leeper, Druckman, & Freese, 2015). As an incentive, participants who completed the survey entered into a lottery to win one of several video projectors. After providing informed consent, each participant proceeded through the online survey, viewing one question per screen with no option to return to previous items, thereby reducing the potential for anchoring or revision bias. The survey was administered individually, and participants completed it independently in one sitting. At the beginning of the survey, participants were presented with a brief debriefing message outlining the study's goals and ethical assurances. We collected a range of demographic characteristics—including age, gender, educational attainment, political affiliation, and baseline religiosity—which allow for stratified analysis and robustness checks across relevant subgroups.

We find that exposure to the scientific message significantly lowers self-reported religiosity relative to the control group, whereas there was no detectable effect for the religious message. This suggests that even identities often seen as deeply rooted—such as religiosity—are contextually malleable, and that direction hinges on framing. Scientific messages, by emphasizing psychological and social foundations of well-being, may prompt individuals to distance themselves from religious explanations, while religious framings simply reaffirm existing commitments. This asymmetry aligns with research in identity economics, in which salient contexts and frames reshape self-conception, but updates are larger when the new frame credibly competes with prior beliefs (Akerlof & Kranton, 2000).

The implications extend beyond religion. Religiosity is linked to charitable giving, saving, trust, and political preferences, meaning that even subtle shifts in self-concept can affect downstream economic and social behaviors. More broadly, if brief framings can alter identification in this domain, they may also influence other seemingly durable identities such as nationalism, ideology, or partisanship. Everyday communication—through public campaigns, education, or social media—may therefore carry unintended effects on how individuals see themselves and act. Recognizing this sensitivity to framing is essential for designing prosocial interventions that are both effective and ethically sound.

This study makes three contributions. First, while most prior work relies on observational correlations between religiosity and behavior (Guiso, Sapienza, & Zingales, 2006; Iannaccone, 1998; McCleary & Barro, 2006), we provide causal evidence that religious self-identification can shift in response to external cues. Second, by directly testing the malleability of religiosity, we demonstrate that even core identities regarded as stable

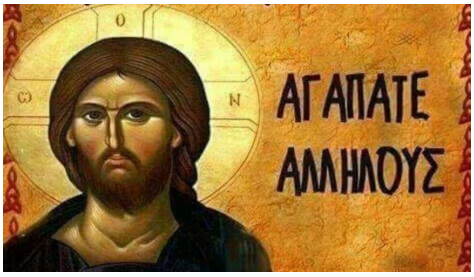
over time are open to influence. Third, we uncover asymmetric framing effects: scientific messages reduce religiosity, while religious messages do not, suggesting that people are more responsive to challenges than affirmations of their beliefs (Bénabou & Tirole, 2011; Falk & Szech, 2013). In doing so, we expand the scope of nudges beyond decision-making to identity itself (Benjamin, Choi, & Strickland, 2010; DellaVigna, 2009), offering novel evidence for the sociology and psychology of religion, and highlighting the role of subtle communication in shaping deeply held identities.

## Current Study

We conducted a pre-registered randomized online survey experiment to test the malleability of individuals' perceptions of their own religiosity. Adult participants were recruited via an online platform and randomly assigned to one of three conditions: (i) a religious nudge emphasizing the centrality of Christ in life; (ii) a scientific nudge summarizing peer-reviewed research on the importance of human connection; or (iii) a control group receiving no message. Each message was presented as a short text embedded within an online survey hosted on Qualtrics, with randomization implemented automatically by the platform. Immediately afterward, participants reported their religiosity on a standardized self-assessment scale from 0 ("not at all religious") to 10 ("very religious") and their desire for a praying frequency. This design allows us to causally identify whether brief, message-based framings can alter self-reported religiosity in the short term. The nudges participants were exposed to appear below in Figure 1.

Figure 1: Religious and Scientific Randomized Treatments

**Religious Message**




**Jesus Christ taught us to:**

- Love one another (John 13:35)
- Love your enemies (Luke 6:27–28)

**Scientific Message**

"Research from the University of California concludes that people can increase their happiness through simple positive activities, such as expressing gratitude or interacting with other people (Lyubomirsky & Layous, 2013)."

The religious message drew on Biblical verses emphasizing love and compassion (John 13:35; Luke 6:27–28), while the scientific message cited psychological research (Lyubomirsky & Layous, 2013) reporting that simple positive activities—such as expressing gratitude or engaging with others—promote well-being. Both interventions emphasized the same core theme: prosocial behavior and human connection as foundations of a meaningful life. The distinction lies in the framing: the religious nudge appealed to spiritual authority and moral obligation, while the scientific nudge appealed to empirical evidence and psychological findings. The

control group received no message. These brief interventions were designed as prosocial nudges, encouraging participants to reflect on human relationships and the value of caring for others. While both highlighted gratitude, compassion, and social engagement as pathways to well-being, they differed fundamentally in source–Christian scripture versus psychological science. This contrast allows us to test whether the credibility and cultural resonance of a message's origin can shape how individuals reassess their own religiosity.

We collected responses from participants affiliated with a random sample of universities across Greece, which agreed to disseminate our survey through their official platforms. Our study was approved by the Institutional Review Board (IRB) at Athens University of Economics and Business, with informed consent obtained from all participants. As we would expect, the majority of participants are originally from Attiki, the most densely populated area of Greece.[1]

We collected demographic information on age, gender, education, and religiosity background to verify covariate balance and assess heterogeneity in treatment effects. The experiment was pre-registered, with analyses conducted according to a pre-specified plan. Immediately after exposure to a randomly assigned message, participants completed survey items measuring their own religiosity. All participants provided informed consent, and the study received approval from the appropriate institutional review board. Further details regarding the sample, recruitment, and measurement instruments are available in the Materials and Methods section.

[1]We show in Figure A1 the share of our respondents by region of origin.

# Results

**Sample and Balance:** The analytic sample comprises 1,136 adults (54% women; mean age = 28.4). Table 1 reports respondent demographics. Most respondents have a high school education or below (52%), followed by a Bachelor's degree (27%), a Master's degree (17%), and a PhD (4%). The majority are single (70%), while 23% are married. In terms of religion, 75% identify as Christian (Orthodox) and 20% as non-religious. Additionally, 78% share a grandparent's first name, and 29% completed the survey during the Christmas or Easter months. Randomization produced a near-even split across arms (34% religious nudge, 33% scientific nudge, 33% control).[2]

Baseline covariates are balanced across treatment arms, consistent with random assignment implemented by the computer. Table 2 shows a compact summary of the balance checks across the 20 covariates. We also report the regression-based balance tests for each baseline variable in Table A3. These balancing tests suggest that the allocation of participants across conditions was determined entirely by randomization.

**Baseline Effects on Religiosity Outcomes and Placebo:**

Experimental evidence on whether ideologically framed messages can shift deeply rooted identities is scarce. Our randomized controlled design identifies the causal effect of framing on religiosity. To test whether brief prosocial nudges—framed to carry the same content and vary only in terms of the scientific versus religious source—affect religiosity, we regress each outcome on treatment indicators for the scientific and religious arms, using the control arm as the omitted category. We consider

[2]For completeness, in Appendix A we present descriptive statistics of the main outcomes in Table A1, and similarly in Table A2 means and standard errors for each treatment category.

the following outcomes: (i) Importance of God, a 0–10 scale (0 = not at all important; 10 = very important), and (ii) Desire to pray often, a binary variable equal to 1 if respondents report wanting to pray once or several times per day and 0 otherwise.[3] Because the different nudges are randomly assigned across participants, covariates are not necessary for identification; when included for precision, results are unchanged. Heteroskedasticity-robust standard errors are reported.

Table A4 reports the results. We control for baseline religiosity in all specifications, i.e. participants' response to the baseline question about how important God is in their lives (0–10 scale, as mentioned before). In specifications (2), (4), and (6), we include a comprehensive set of individual-level covariates, including gender, age, education, marital status, family income, and religion. We report results using both the raw 0–10 Importance of God score in columns 1-2 and its standardized (z-score) version in columns 3-4 (mean = 0, SD = 1 in the full sample). Findings are qualitatively unchanged across scales. We find that participants exposed to the scientific nudge condition report significantly lower levels of religiosity compared with those in the control group ($P < 0.05$). In contrast, the religious nudge does not produce a statistically significant difference in participants' reported religiosity relative to the control. Robustness checks using alternative estimation methods—specifically, a logit model for the binary outcome (Table A5)—yield the same qualitative conclusions.[4]

The economic magnitude of this baseline effect is nontrivial. The scientific message lowers the 0–10 religiosity scale by 0.167 points, a 1.67%

[3]The exact survey items can be found in Appendix B. Outcome (i) is adapted from the World Values Survey. We estimate a linear model for continuous outcomes and a linear probability model for the binary outcomes.

[4]The results become even starker when we limit our sample to those who report believing in God, as shown in Table A6.

decline relative to the full response range, and corresponds to about 4.5% of a standard deviation when using the z-scored religiosity outcome. Although modest in absolute terms, this shift follows from a single, low-cost, non-invasive nudge exposure, indicating that brief scientific framing can measurably move religiosity.[5]

Panel A of Figure 2 provides the visual representation of the baseline results: scientific framings seem to reduce religious self-concept, whereas religious nudges do not appear to reinforce or elevate it. Panel B shows the results from placebo regressions, in which we re-estimate our baseline regression on placebo outcomes (Table A7). These are survey items (positioned after treatments within the randomization blocks, see Appendix B) that should not be affected by the brief prosocial nudge (e.g., stable political ideology and fixed behaviors such as prior vaccination status). Estimated coefficients are small and statistically indistinguishable from zero, which suggests that treatment effects in Panel A are confined to religiosity rather than reflecting generalized response shifts.

The asymmetry—scientific frames reduce religiosity, whereas religious frames do not increase it—may reflect (i) a ceiling effect, with many individuals already near the upper bound of religiosity, and (ii) differences in credibility and novelty, since in some societies (e.g., Greece) religious messages are familiar and thus weakly informative, whereas scientific messages draw on a domain associated with rationality and authority. Making that perspective salient can diminish the salience of religious identity and reduce religiosity.

Scientific framing may reduce reported religiosity by activating an alternative moral frame. When prosocial behavior is attributed to science

[5]Because religiosity is measured immediately after nudge exposure, our estimates capture a short-run shift in identity salience. We cannot infer persistence without follow-up measurement.

rather than religion, participants may reallocate moral authority, treating science and religion as substitutes. Because scientific messages carry high credibility in contemporary settings, they make a secular framework more salient and can create tension for some—this may suggest that morality and human connection need not to rely on religion. This explains why scientific nudges may reduce the salience of religious identity at the moment of self-assessment.

We then examine whether the content of the nudge affects participants' perceptions. Both nudges rely on prosocial nudges that highlight the importance of caring for others. We hypothesize that participants' response to the survey item "What is your attitude toward immigrants in our country?" may capture a direct impact on perceptions of support for immigrants. The binary outcome we use takes the value of 1 if a participant reports that they have a positive or very positive attitude towards immigrants. In Figure A2, we show the treatment effects of the scientific and religious nudges on participants' perceptions toward immigrants. We find an improvement in attitudes toward immigrants for both treatments. However, it is statistically significant and twice in magnitude for the scientific nudge. We also report the estimates in columns (1) and (2) of Table A8. We find no treatment effects on revenge, non-robust effects on supernatural beliefs, civil rights, and religious openness, as shown in Tables A8 and A9. However, exposure to the religious nudge decreases the likelihood of respondents expressing support for abortion by 0.10 standard deviations (significant at the 10% level), consistent with the expectation that religious framing reinforces traditional moral norms.

**Heterogeneous Effects:** In Figure 3, we split respondents at the median of the baseline religiosity item ("How important is God in your

life?") and re-run our specification separately for those above and below the median baseline religiosity. In Panel A, we show that among those above the median, the scientific nudge lowers the importance of God value and the probability of them wanting to pray often. In Table A10 we show that the scientific nudge reduces the importance of God by about 0.17 and the desire to pray often by about 12 percentage points ($\hat{\beta}$ = -0.121, SE=0.047). The religious nudge leaves the desire to pray often unchanged. Panel B of Figure 3 shows that the difference between scientific and religious nudges is statistically significant—at the 10% level—for both religiosity variables (two-sided test, p = 0.073 for the importance of God and p = 0.004 for the desire to pray often). Among those below the median, both nudges yield effects near zero and statistically indistinguishable from one another. Taken together, the impact is concentrated among individuals with high baseline religiosity. A credible scientific framing may provide an alternative, non-religious justification for prosociality, reducing the marginal value of affirming high religiosity. For completeness, Tables A11, A12, and Figure A3 and Figure A4 in Appendix A show limited systematic heterogeneity across demographic splits and naming/seasonality proxies, with most subgroup estimates being modest and overlapping zero.

# Validation

We compute region-level means by respondents' region of origin (51 prefectures) and merge these with WVS region means. We then compare control-group means from our survey to the WVS benchmarks (Figure A5). The age-standardized measures are positively correlated across regions between our survey and the WVS, indicating convergent validity

and supporting external generalizability. We present the spatial variation of the importance of God (at the region-level) based on our respondent's region of origin in Figure A6.

To assess the external validity of our findings, we compare the distribution of religiosity values in our sample to those observed in a widely used dataset in the social sciences: the World Values Survey (WVS) (Haerpfer, Inglehart, Moreno, Welzel, Kizilova, Díez-Medrano, Lagos, Norris, Ponarin, & Puranen, 2022). We use the wave fielded in 2017 for Greece (the most recent available for Greece that records religiosity) and post-stratify WVS observations to match our sample's age distribution. Both surveys use the identical item, "How important is God in your life?" on a 0–10 scale (0 = not at all important; 10 = very important). We harmonize regional units and compute region-level means by respondents' region of origin (51 prefectures), then merge these with the WVS region means. We compare control-group means from our survey to the WVS benchmarks (Figure A5). The age-standardized measures are positively correlated across regions between our survey and the WVS, which indicates convergent validity and supports external generalizability.

We assess internal validity using a name-based proxy for religiosity, by adapting recent approaches that exploit the cultural transmission of given names within families (Andersen & Bentzen, 2023; Knudsen, 2024). The idea is that religious first names proxy deeply rooted family preferences. We find that first names are intergenerationally transmitted in our setting (78% of our participants have the same first name as their grandparents in our survey, Table 1). We classify first names as religious versus secular (predominantly Ancient Greek). Figure A7 presents a word cloud of respondents' first names, with larger names occurring more frequently in the sample. A first name is coded as religious if it appears on the offi-

cial registry of the Greek Orthodox saints[6], allowing canonical variants. Because many Greek names have a "name day" without a canonized saint, name-day status alone is not considered evidence of sanctity. For names without a saint match, we consult the Lexicon of Greek Personal Names (LGPN)—a comprehensive corpus of Greek personal names from inscriptions, papyri, coins, and literary sources—to determine earliest attestation. Names predominantly attested prior to the 1st century CE are coded as secular (ancient); names whose earliest attestation is in Christian sources or usage are coded as religious; modern non-Christian names are coded as secular (Assael, Sommerschield, Shillingford, Bordbar, Pavlopoulos, Chatzipanagiotou, Androutsopoulos, Prag, & de Freitas, 2022). Names of non-Greek origin are, by definition, non-Christian Orthodox in this coding rule and are assigned a value of zero.

Figure A8 shows the mean differences in the importance of God in life values (Panel A) and the mean differences in the share of participants with a desire to pray often (Panel B) for participants with secular vs. religious first names in our sample. Participants with religious first names report higher levels of religiosity ($p < 0.005$ in Panel A and $p < 0.002$ in Panel B) relative to those with secular first names.

We conduct another validation exercise to assess the validity of our first-name religiosity measure. We digitized the Orthodox Church's official directory (Diptycho), which lists the names of the universe of priests in Greece (N=8,311).[7] Using the rule described above, we classified first names of priests as religious or secular. As shown in Figure A9, 60% of priests have a religious first name. This pattern provides additional valid-

[6]The official website of the Greek Orthodox church can be found here: https://ecclesiagreece.gr/.

[7]We excluded entries in which the first name appeared only as an unclear abbreviation, which makes the classification between Christian and secular ambiguous.

ity for the measure: in a population with demonstrably high religiosity (ordained clergy), religious names are disproportionately common; our classification recovers precisely this monotonic relationship, which indicates that our religiosity distinction based on the first name is informative about underlying religiosity.

## Discussion

We provide causal evidence that a core identity—religiosity—moves at the margin in response to brief framings. Messages with identical prosocial content reduce self-reported religiosity only when attributed to scientific authority; parallel religious attributions leave religiosity unchanged. The asymmetry is concentrated among highly religious respondents and does not spill over to placebo outcomes, which indicates a targeted rather than a generalized response. Validation exercises using first-name religiosity, priests' names, and WVS benchmarks support measurement credibility.

Why might scientific attribution lower religiosity? A scientific frame can briefly redirect attention to a secular perspective, which moves perceived moral authority away from religious self-identification. In a relative religious context, religious cues are familiar and weakly informative, whereas scientific cues carry novelty and credibility—sufficient to nudge a subset of respondents off the top of the scale. The largest shifts appear among those with very high baseline religiosity, consistent with greater scope for down-adjustment at the top of the scale.

The broader implication is that identity-relevant beliefs can be shifted by low-cost narratives that circulate in everyday institutions—schools, universities, health campaigns, and digital platforms. As communication environments increasingly highlight scientific language (e.g., well-

being, prosociality, social connection), these cues may subtly reshape self-perceptions of religiosity—sometimes as a by-product, not a policy goal. This warrants ethical caution: interventions designed to promote civic or health outcomes should consider unintended identity effects, especially in pluralistic or interfaith contexts.

Our estimates are local to a specific sample from Greece; external validity to older cohorts, rural communities, or non-Christian settings remains to be established. Two priorities follow: First, replicate across populations and religious traditions. Second, test persistence and behavioral consequences with follow-ups and field settings (e.g., charitable giving or volunteering). Finally, future work should isolate mechanisms—credibility, novelty, perceived source authority, or threat to sacred values—using factorial designs that vary source and content orthogonally.

Taken together, the results suggest that identities often treated as fixed are context-sensitive and that the language used to commend prosociality can nudge not only choices but self-conceptions.

# Materials and Methods

## Empirical Specification

Our identification strategy relies on a preregistered randomized controlled trial (RCT) designed to causally estimate how brief prosocial nudges—framed in either religious or scientific language—affect individual religiosity. A total of 1,136 participants were randomly assigned to one of three experiemental conditions: (i) a *religious framing* group, (ii) a *scientific framing* group, or (iii) a *control* group that received no message. Both treatment groups viewed a short prosocial message paired

with an image thematically consistent with the respective framing.

Random assignment ensures that, in expectation, both observed and unobserved characteristics are balanced across groups. This design allows us to attribute post-treatment differences in religiosity to the framing of the message rather than to preexisting traits.

Religiosity was measured immediately after exposure to the pro-social nudges assessing belief strength and religious self-identification. Our main estimating equation is:

$$Y_i = \alpha + \beta_1 \cdot \textit{Religious}_i + \beta_2 \cdot \textit{Scientific}_i + \mathbf{X}_i'\gamma + \varepsilon_i \tag{1}$$

where $Y_i$ denotes the religiosity score for individual $i$; $\text{Religious}_i$ and $\text{Scientific}_i$ are binary indicators for treatment assignment; and $\mathbf{X}_i$ is a vector of prespecified covariates (age, gender, education, marital status, and baseline religiosity) included to improve precision. Robust standard errors are used throughout.

The coefficients $\beta_1$ and $\beta_2$ identify the average treatment effects (ATEs) of the religious and scientific framings relative to the control group. This specification provides a transparent and internally valid framework to test whether subtle differences in prosocial framing can shift a deeply rooted dimension of identity—religiosity—in a controlled environment.

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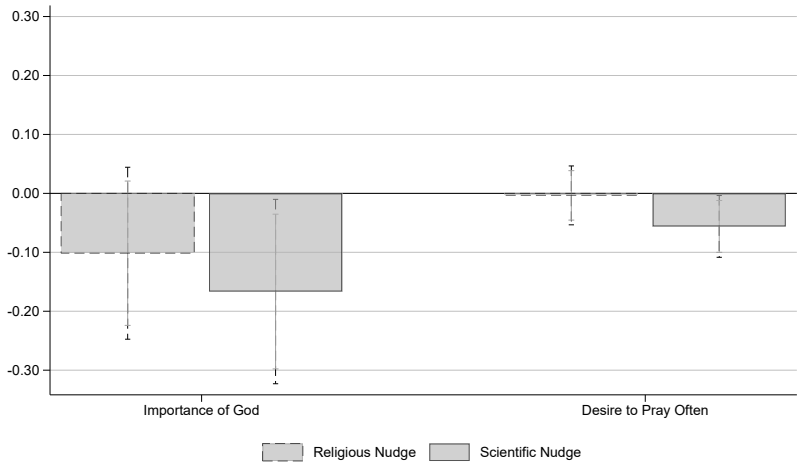
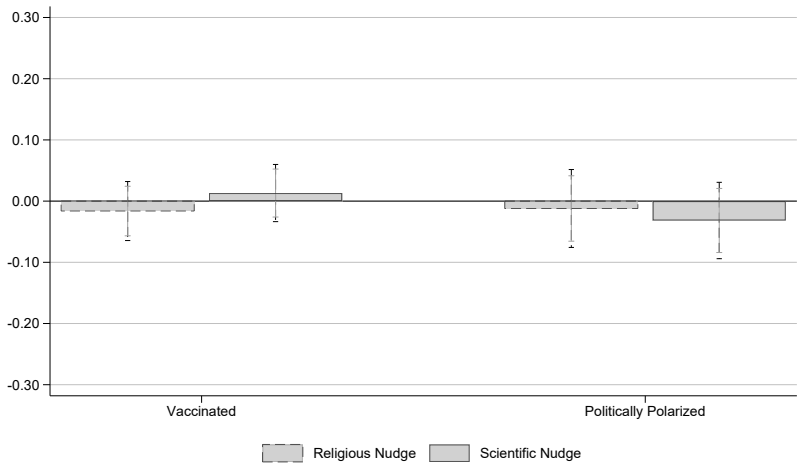
Figure 2: Treatment and Placebo Effects for Importance of God and Desire to Pray Often

Panel A: Treatment Effects



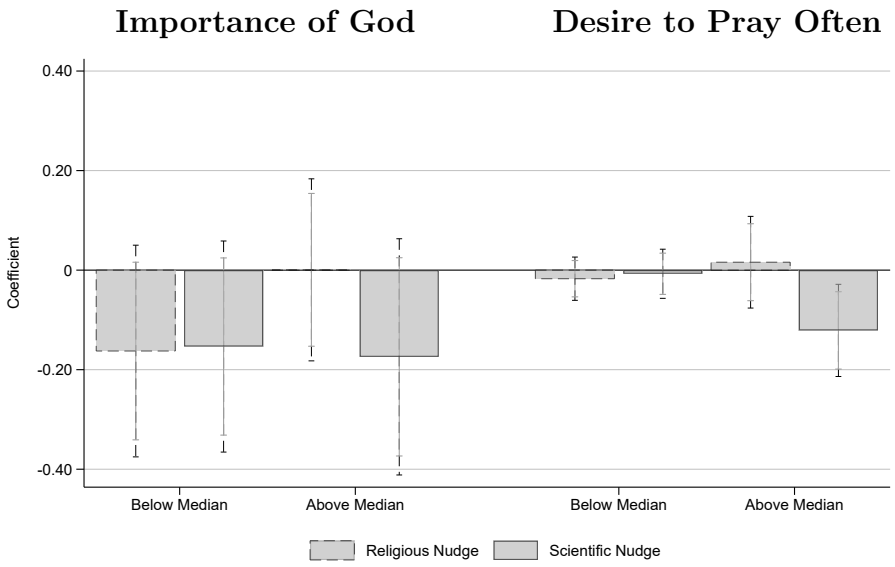

Panel B: Placebo Effects



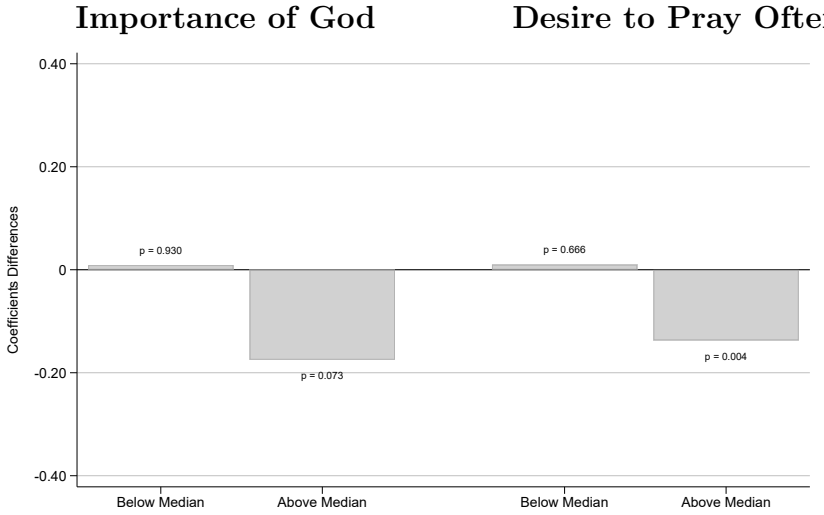

Notes: Panel A reports estimated treatment effects of religious and scientific nudges on two measures of religiosity: the self-reported importance of God and the desire to pray frequently (more than once per week). Bars plot coefficients from OLS regressions with robust standard errors, controlling for baseline religiosity and demographic covariates. These include respondent age (years) and indicators for respondent gender (male/female/other), education (high school/BSc/MSc/PhD), relationship status (single/married or long-term relationship/other), family income (above/below median), and religion (no religion/orthodox/other). The omitted category is the control group. Panel B presents the estimated effects from placebo regressions. Placebo outcomes are COVID-19 vaccination status and political polarization. They are unrelated to religiosity and we test whether treatment effects spill over to domains outside religious identity. Error bars denote 90% (solid gray line) and 95% (dashed black line) confidence intervals with robust standard errors. All estimates are based on the full analytic sample of 1,136 participants.

Figure 3: Heterogeneity by Baseline Religiosity

Panel A: Treatment Effects




Panel B: Net Differences Between Scientific and Religious Nudge




Notes: Panel A reports estimated heterogeneous treatment effects of religious and scientific nudges on two measures of religiosity: the self-reported importance of God and the desire to pray frequently (more than once per week). We present estimates separately for participants declaring the importance of God measured before the treatment below or above the median. Bars plot coefficients from OLS regressions with robust standard errors, controlling for baseline religiosity and demographic covariates. These include respondent age (years) and indicators for respondent gender (male/female/other), education (high school/BSc/MSc/PhD), relationship status (single/married or long-term relationship/other), family income (above/below median), and religion (no religion/orthodox/other). The omitted category is the control group. Panel B presents the difference between coefficients for scientific and religious nudges—based on estimates in Panel A. P-values refer to the p-value of the t-test of the difference between the two coefficients. Error bars denote 90% (solid gray line) and 95% (dashed black line) confidence intervals with robust standard errors. All estimates are based on the full analytic sample of 1,136 participants.

Table 1: Participant Demographic Characteristics

| | Mean | SD | Min | Max | N |
|---|---|---|---|---|---|
| Age (years) | 28.44 | 12.14 | 18 | 78 | 1,136 |
| Survey Completion (min) | 8.93 | 5.29 | 2 | 56 | 1,136 |
| | **Percentage** | | **Frequency** | | **N** |
| Gender | | | | | 1,136 |
| Female | 54 | | 609 | | |
| Male | 46 | | 517 | | |
| Undisclosed/Other | 1 | | 10 | | |
| Education | | | | | 1,136 |
| High School Diploma/Other | 52 | | 591 | | |
| BSc | 27 | | 310 | | |
| MSc | 17 | | 189 | | |
| PhD | 4 | | 46 | | |
| Family Income Above 20,000 | | | | | 1,136 |
| Yes | 37 | | 415 | | |
| Marital Status | | | | | 1,136 |
| Single | 70 | | 794 | | |
| Married/Long-Term Relationship | 23 | | 265 | | |
| Divorced/Separated/Widow/No Answer | 7 | | 77 | | |
| Religion | | | | | 1,136 |
| No Religion | 20 | | 226 | | |
| Orthodox | 75 | | 854 | | |
| Other | 5 | | 56 | | |
| Has a Religious First Name | | | | | 1,122 |
| Yes | 71 | | 793 | | |
| Has a Grandparent Name | | | | | 1,136 |
| Yes | 78 | | 889 | | |
| Response during a Religious Holiday | | | | | 1,136 |
| Yes | 29 | | 335 | | |
| Treatment | | | | | 1,136 |
| Religious Nudge | 34 | | 382 | | |
| Scientific Nudge | 33 | | 376 | | |

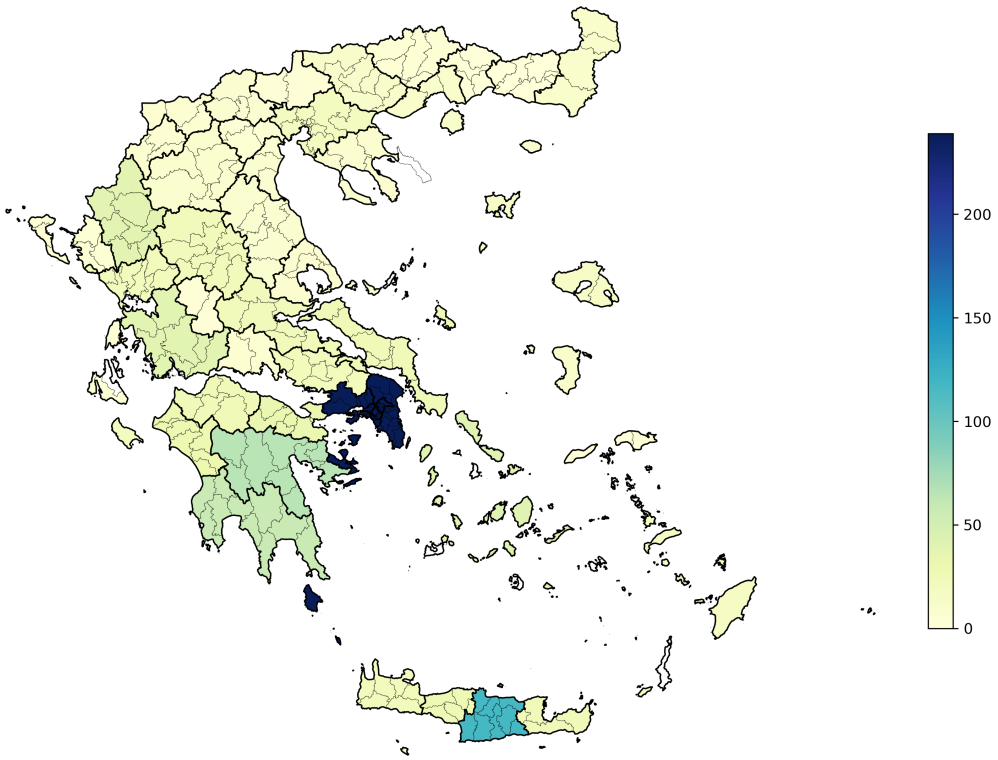
Table 2: Summary of Balancing Exercises

| | Religious Nudge | Scientific Nudge | Control Group | Total |
|---|---|---|---|---|
| Number of Performed Tests | 20 | 20 | 20 | 60 |
| # Significant at 1% Level | 0 | 0 | 3 | 3 |
| # Significant at 5% Level | 1 | 0 | 4 | 5 |
| # Significant at 10% Level | 2 | 4 | 5 | 11 |
| Share Significant at 1% Level | 0.00 | 0.00 | 0.15 | 0.05 |
| Share Significant at 5% Level | 0.05 | 0.00 | 0.20 | 0.08 |
| Share Significant at 10% Level | 0.10 | 0.20 | 0.25 | 0.18 |

Notes: The table summarizes the number (#) and share of statistically significant results across 20 balancing exercises for each treatment group. The observed proportion of significant coefficients at the 1%, 5%, and 10% level is close to what would be expected by chance, which indicates successful randomization.

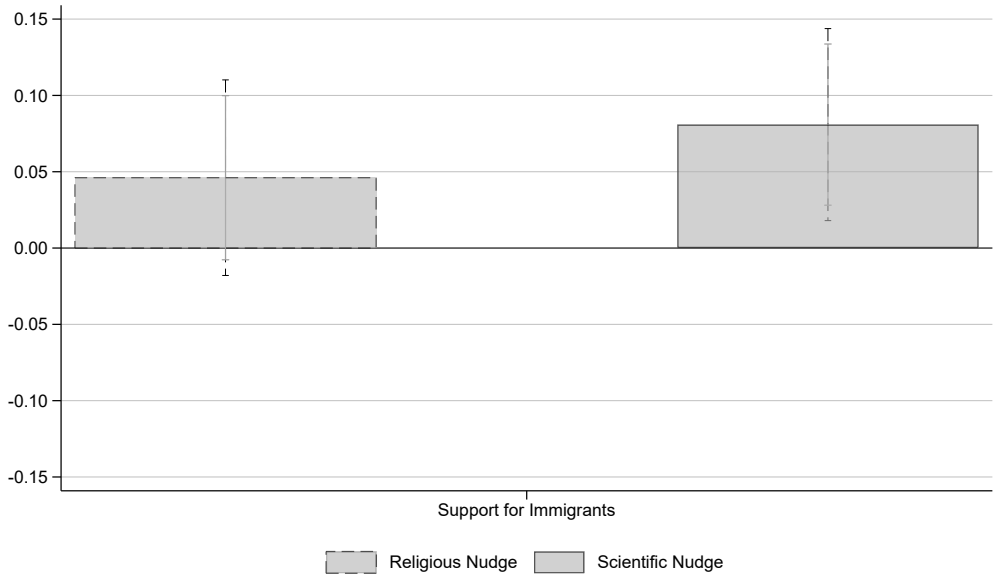
# A Appendix A

Figure A1: Respondent Spatial Density




Notes: The map shows the density of survey respondents across regions.

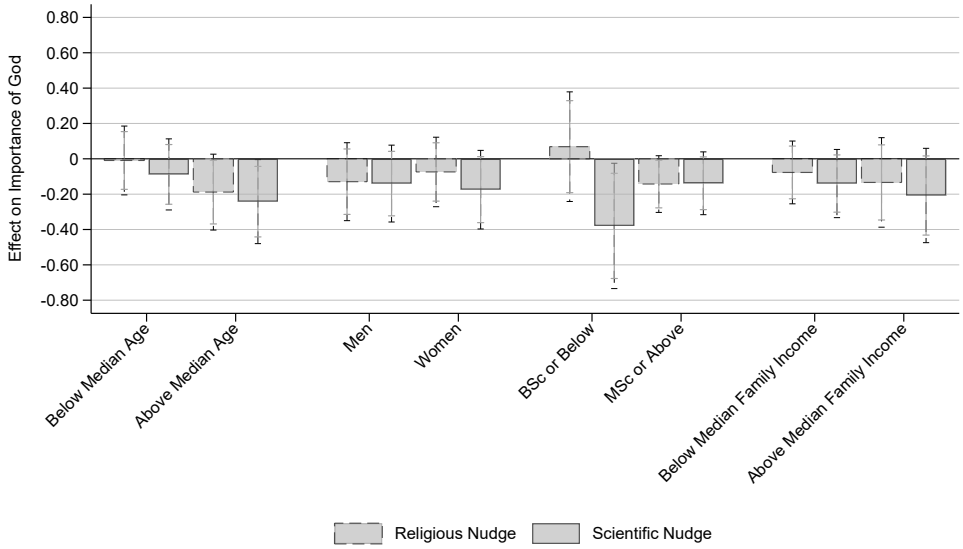
Figure A2: Treatment Effect on Support for Immigrants



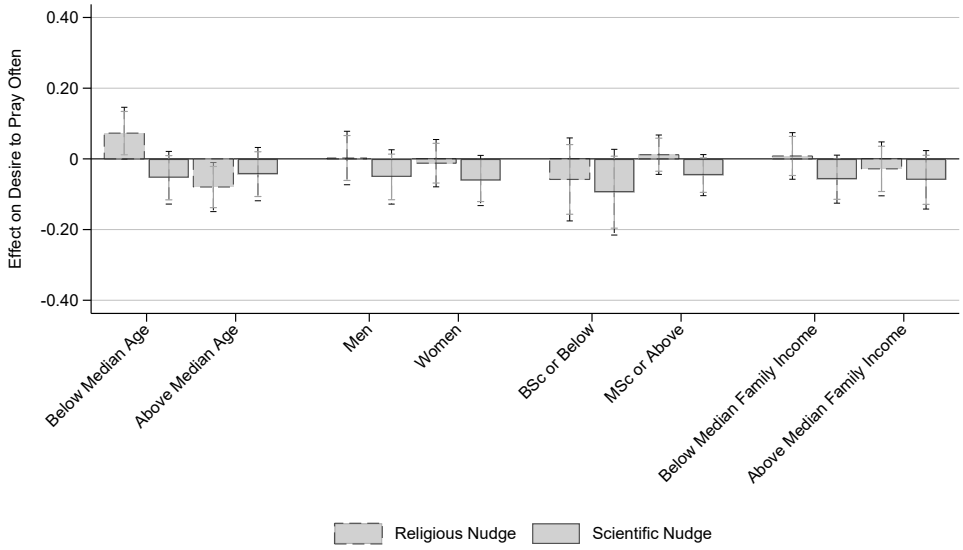

Notes: We report the estimated treatment effects of religious and scientific nudges on support for immigrants (binary). Bars plot coefficients from OLS regressions with robust standard errors, controlling for baseline religiosity and demographic covariates. These include respondent age (years) and indicators for respondent gender (male/female/other), education (high school/BSc/MSc/PhD), relationship status (single/married or long-term relationship/other), family income (above/below median), and religion (no religion/orthodox/other). The omitted category is the control group. Error bars denote 90% (solid gray line) and 95% (dashed black line) confidence intervals with robust standard errors. All estimates are based on the full analytic sample of 1,136 participants.

Figure A3: Heterogeneity by Demographic Characteristics

Panel A: Effect on the Importance of God



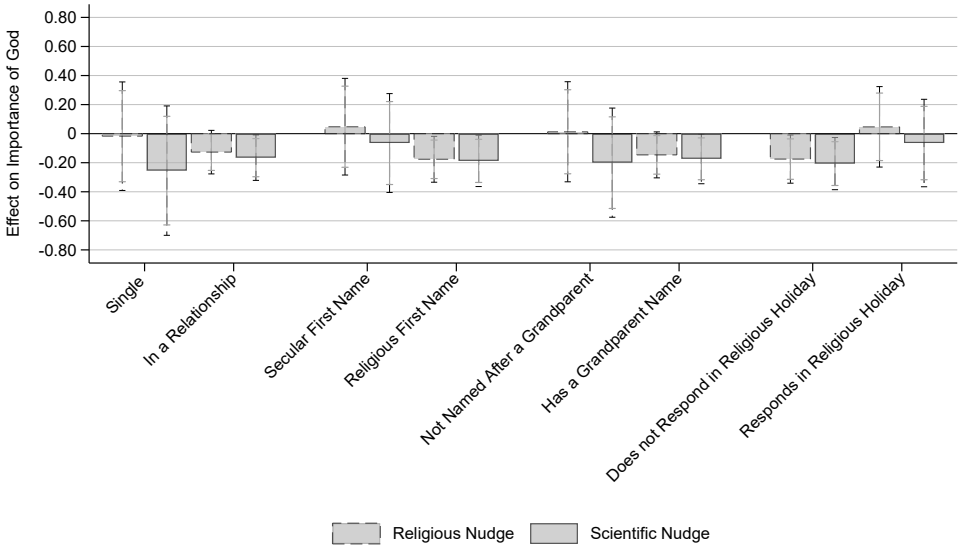

Panel B: Effect on the Desire to Pray Often



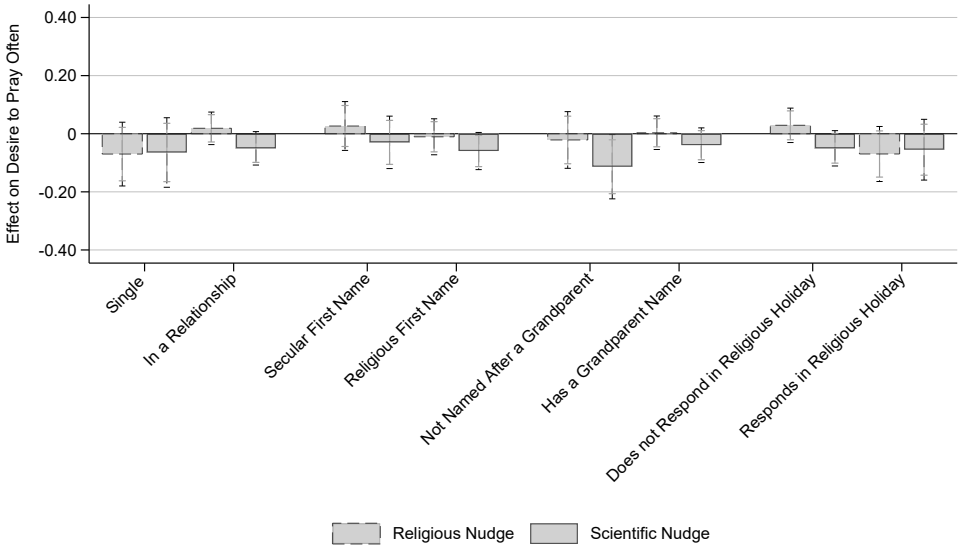

Notes: Panels A and B report estimated heterogeneous treatment effects of religious and scientific nudges on the self-reported importance of God and the desire to pray frequently (more than once per week), respectively. Heterogeneity variables are age (below/above median), gender (male/female), education (below/above BSc), and family income (below/above 20,000 euros). Bars plot coefficients from OLS regressions with robust standard errors, controlling for baseline religiosity and demographic covariates. These include respondent age (years) and indicators for respondent gender (male/female/other), education (high school/BSc/MSc/PhD), relationship status (single/married or long-term relationship/other), family income (above/below median), and religion (no religion/orthodox/other). The omitted category is the control group. Error bars denote 90% (solid gray line) and 95% (dashed black line) confidence intervals with robust standard errors. All estimates are based on the full analytic sample of 1,136 participants.

Heterogeneity by Demographic Characteristics (continuing)

Panel A: Effect on the Importance of God

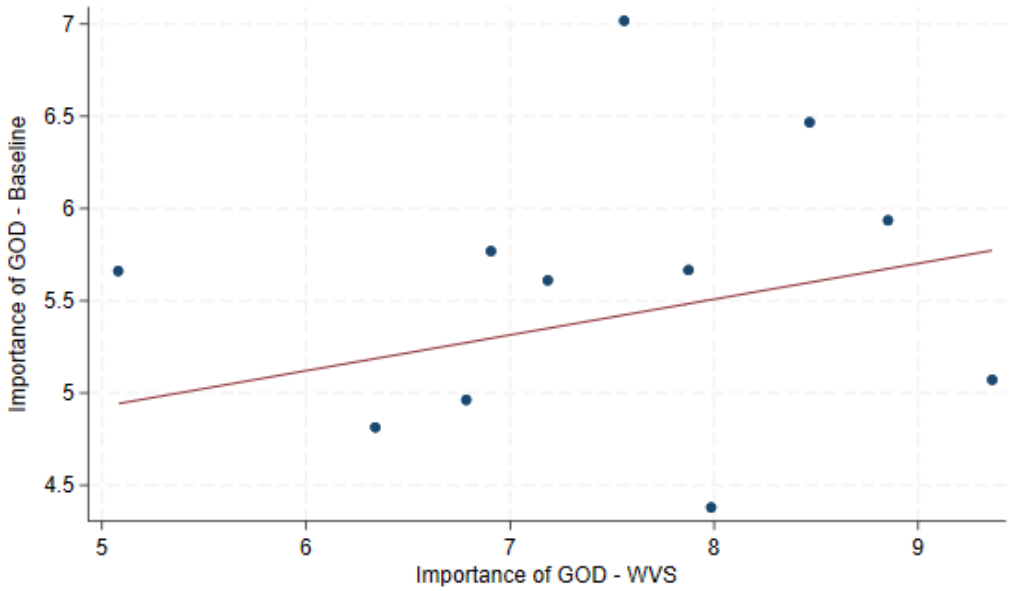



Panel B: Effect on the Desire to Pray Often



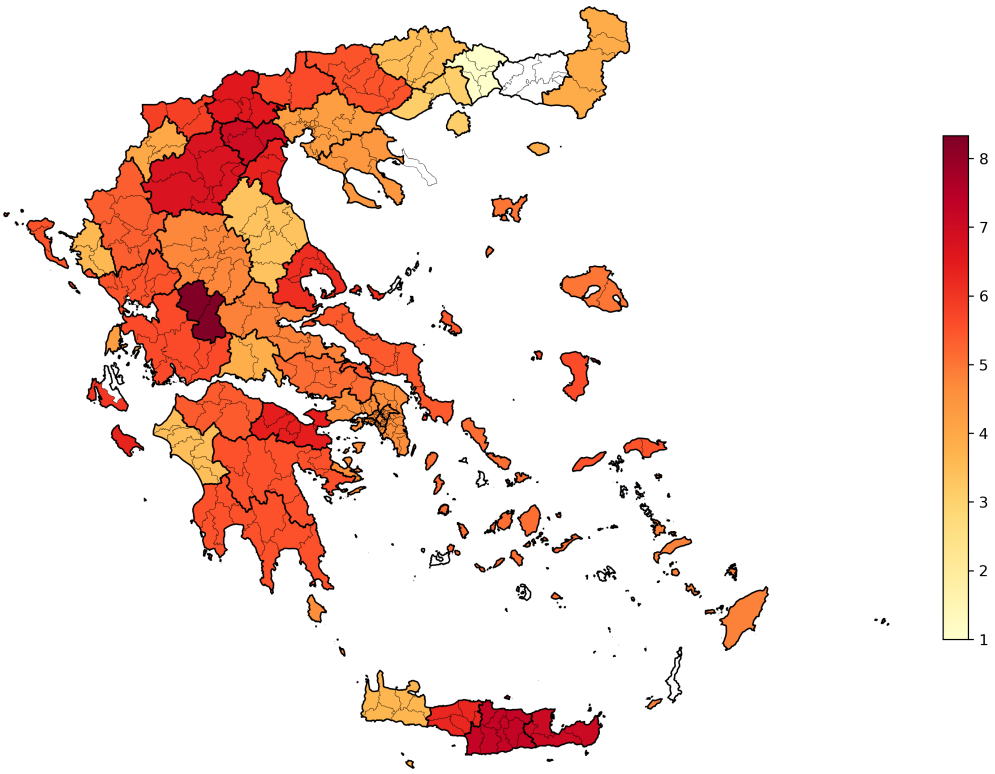

Notes: Panel A and Panel B report estimated heterogeneous treatment effects of religious and scientific nudges on the self-reported importance of God and the desire to pray frequently (more than once per week), respectively. Heterogeneity variables are marital status (single/in a relationship), whether the participant has a religious first name (no/yes), whether the participant has their grandparent's name (no/yes), and whether the participant responded during the month of a religious holiday (no/yes). Bars plot coefficients from OLS regressions with robust standard errors, controlling for baseline religiosity and demographic covariates. These include respondent age (years) and indicators for respondent gender (male/female/other), education (high school/BSc/MSc/PhD), relationship status (single/married or long-term relationship/other), family income (above/below median), and religion (no religion/orthodox/other). The omitted category is the control group. Error bars denote 90% (solid gray line) and 95% (dashed black line) confidence intervals with robust standard errors. All estimates are based on the full analytic sample of 1,136 participants.

Figure A5: Correlation between the Religiosity Measure in our Survey and the World Values Survey




Notes: The figure shows the correlation between participants' responses to "How important is God in your life?" in our survey and in the World Values Survey (WVS). Both items are identically worded and use a 0–10 scale (0 = not at all important; 10 = very important). Higher values indicate greater perceived importance of God.

Figure A6: Spatial Variation of the Importance of God Based on our Survey



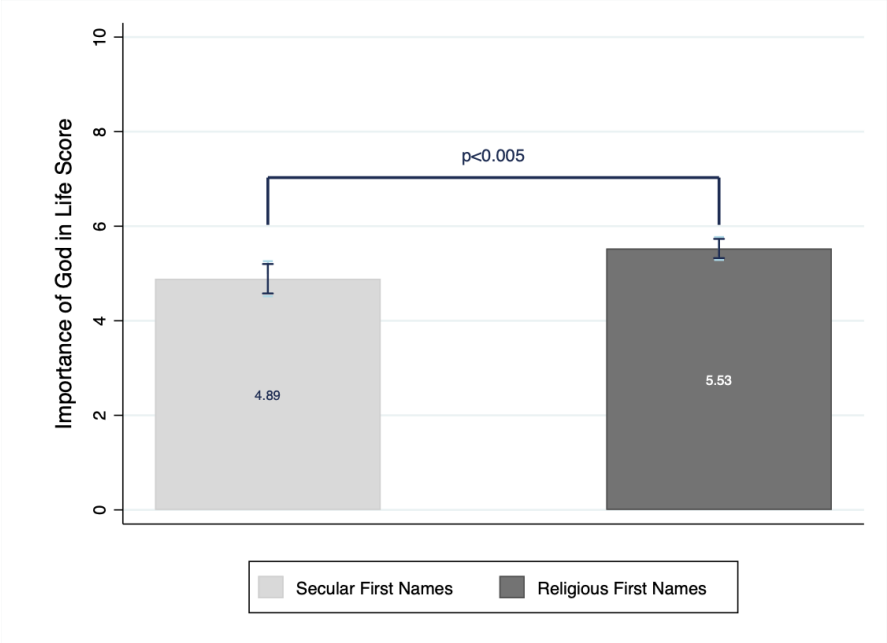

Notes: The map shows the average spatial values of the Importance of God in our survey across regions. Survey items use a 0–10 scale (0 = not at all important; 10 = very important).

Figure A7: Word Cloud with First Names from our Survey

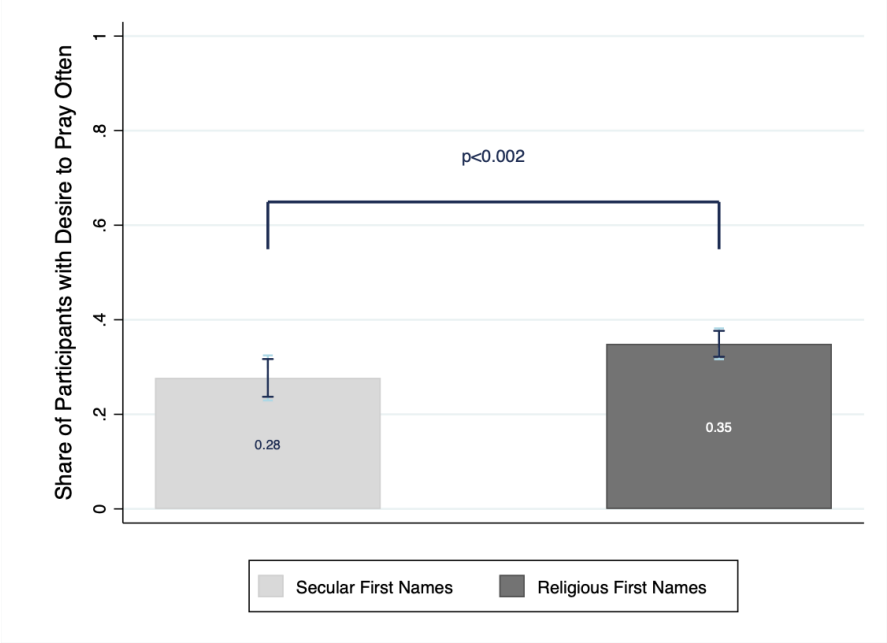

Notes: The figure displays a word cloud of first names from the survey. Name size is proportional to its frequency among respondents.

Survey Self-reported Religiosity and First-name–based Religiosity Based on Epigraphic Studies (LGPN)

Panel A: Importance of God in Life by First-name–based Religiosity

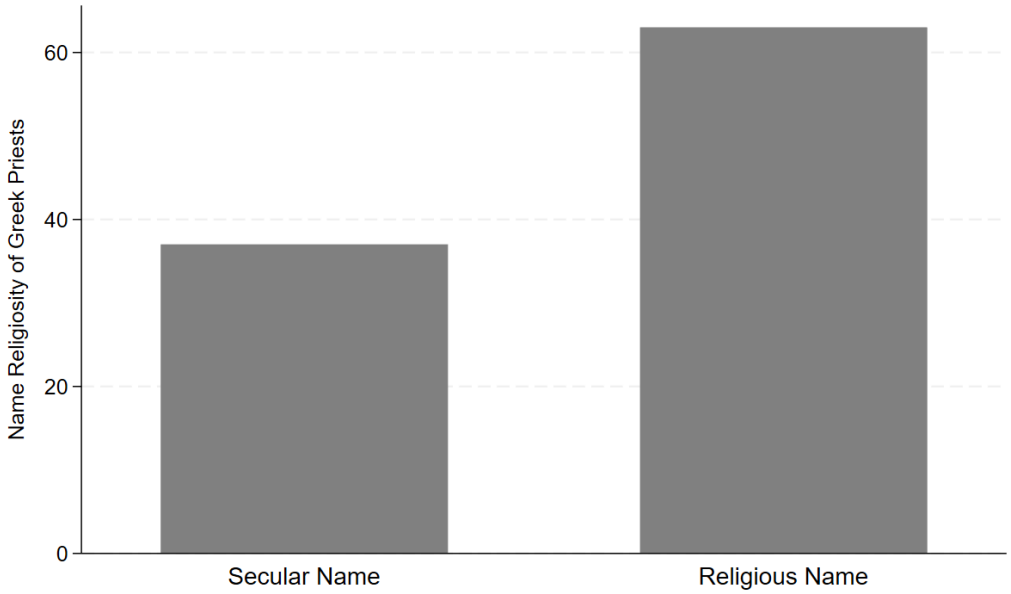



Panel B: Importance of God in Life by First-name–based Religiosity




Notes: The figure shows mean differences in the importance of God in life measured in the survey (Panel A) and mean differences in the desire to pray often (Panel B) for participants who have a secular first name and those with a religious first name. First names are classified as *religious* (canonically associated with an Orthodox saint; ecclesia.gr) or *secular* (no saint match; identified as Ancient Greek or modern non-Christian via the LGPN epigraphic corpus). Y-axis values are raw scores of the importance of God in life measure in the survey with a range of [0-10] (0 = not at all important; 10 = very important). P-values denote significance levels from two sample mean comparison tests.

Figure A9: Share of Priests with Religious and Secular First Names




Notes: The figure shows the share of priests who have a secular and a religious first name based on our first-name classification. Bars show the proportion of priests whose first names are classified as *religious* (canonically associated with an Orthodox saint; ecclesia.gr) or *secular* (no saint match; identified as Ancient Greek or modern non-Christian via the LGPN epigraphic corpus). First-name religiosity is determined based on epigraphic studies from the Lexicon of Greek Personal Names (LGPN). We use the universe of priests in Greece—a dataset we digitized from the official book of the Christian Orthodox Church.

Table A1: Descriptives of Participant Religiosity

| | Mean | SD | Min | Max | N |
|---|---|---|---|---|---|
| Main Outcomes and Placebo Variables | | | | | |
| Importance of God | 5.06 | 3.68 | 0 | 10 | 1,136 |
| Desire to Pray Often | 0.32 | 0.47 | 0 | 1 | 1,136 |
| Politically Polarized | 0.27 | 0.45 | 0 | 1 | 1,136 |
| Vaccinated for COVID-19 | 0.86 | 0.35 | 0 | 1 | 1,136 |
| Willingness to | | | | | |
| Take Revenge | 4.47 | 2.76 | 0 | 10 | 1,136 |
| Punish if YOU Affected | 4.76 | 2.81 | 0 | 10 | 1,136 |
| Punish if OTHER Affected | 5.13 | 2.67 | 0 | 10 | 1,136 |
| Religious Beliefs | | | | | |
| God | 0.69 | 0.46 | 0 | 1 | 1,136 |
| Afterlife | 0.48 | 0.50 | 0 | 1 | 1,136 |
| Hell | 0.30 | 0.46 | 0 | 1 | 1,136 |
| Paradise | 0.41 | 0.49 | 0 | 1 | 1,136 |
| Attitudes towards | | | | | |
| Immigrants | 2.70 | 0.95 | 1 | 5 | 1,136 |
| Homosexuals | 2.32 | 1.35 | 1 | 5 | 1,136 |
| Acceptance of | | | | | |
| Abortion | 7.18 | 3.07 | 0 | 10 | 1,129 |
| Homosexuality | 7.74 | 3.25 | 0 | 10 | 1,117 |
| Premarital Sex | 9.19 | 2.11 | 0 | 10 | 1,131 |
| Religion vs Science | 1.79 | 0.72 | 1 | 4 | 1,126 |
| Religious Openness | 1.68 | 0.76 | 1 | 4 | 1,124 |

Notes: The table presents descriptive statistics for measures of religiosity, moral attitudes, and prosocial preferences. Variables are measured on 0–10 or 1–5 Likert scales unless otherwise noted. "Religion vs. Science" and "Religious Openness" capture attitudes toward religious versus scientific worldviews and openness to other religions. "Religious Beliefs" include binary indicators for belief in God, afterlife, hell, and paradise. The bottom panel shows treatment allocation, and church attendance.

Table A2: Descriptives of Religiosity Measures by Treatment Status

| Outcome | Treatment Type | | |
|---|---|---|---|
| | Religious Nudge | Scientific Nudge | Control |
| Main Outcomes and Placebo Variables | | | |
| Importance of God | 4.92 | 5.24 | 5.02 |
| | (3.65) | (3.63) | (3.77) |
| Desire to Pray Often | 0.32 | 0.31 | 0.34 |
| | (0.47) | (0.46) | (0.47) |
| Politically Polarized | 0.27 | 0.25 | 0.30 |
| | (0.45) | (0.43) | (0.46) |
| Vaccinated for COVID-19 | 0.84 | 0.86 | 0.87 |
| | (0.37) | (0.34) | (0.34) |
| Willingness to | | | |
| Take Revenge | 4.49 | 4.53 | 4.39 |
| | (2.77) | (2.78) | (2.73) |
| Punish if YOU Affected | 4.76 | 4.68 | 4.85 |
| | (2.82) | (2.77) | (2.85) |
| Punish if OTHER Affected | 5.02 | 5.08 | 5.28 |
| | (2.70) | (2.60) | (2.72) |
| Religious Beliefs | | | |
| God | 0.67 | 0.71 | 0.69 |
| | (0.47) | (0.45) | (0.46) |
| Afterlife | 0.50 | 0.48 | 0.47 |
| | (0.50) | (0.50) | (0.50) |
| Hell | 0.31 | 0.30 | 0.29 |
| | (0.46) | (0.46) | (0.46) |
| Paradise | 0.42 | 0.42 | 0.40 |
| | (0.49) | (0.49) | (0.49) |
| Acceptance of | | | |
| Abortion | 7.02 | 7.15 | 7.38 |
| | (3.15) | (3.00) | (3.06) |
| Homosexuality | 7.91 | 7.54 | 7.76 |
| | (3.24) | (3.25) | (3.27) |
| Premarital Sex | 9.14 | 9.22 | 9.20 |
| | (2.16) | (2.09) | (2.09) |
| Attitudes toward | | | |
| Immigrants | 2.73 | 2.66 | 2.72 |
| | (0.95) | (0.89) | (1.00) |
| Homosexuals | 2.26 | 2.36 | 2.32 |
| | (1.34) | (1.34) | (1.39) |
| Religion vs. Science | 1.75 | 1.82 | 1.79 |
| | (0.69) | (0.71) | (0.75) |
| Religious Openness | 1.62 | 1.73 | 1.70 |
| | (0.72) | (0.77) | (0.80) |
| Observations | 382 | 376 | 378 |

Table A3: Balance Checks of Covariates

| | (1) Religious Nudge | (2) Scientific Nudge | (3) Control Group | N |
|---|---|---|---|---|
| Survey Completion (min) | 0.004 | 0.000 | -0.003 | 1,136 |
| | (0.003) | (0.003) | (0.003) | |
| Importance of God (baseline) | -0.004 | 0.007* | -0.003 | 1,136 |
| | (0.004) | (0.004) | (0.004) | |
| Above Median Age (years) | -0.059** | -0.052* | 0.110*** | 1,136 |
| | (0.028) | (0.028) | (0.028) | |
| Sex: Female | -0.031 | 0.009 | 0.023 | 1,136 |
| | (0.028) | (0.028) | (0.028) | |
| Education: Diploma | 0.026 | 0.047* | -0.073*** | 1,136 |
| | (0.028) | (0.028) | (0.028) | |
| Education: BSc | -0.006 | -0.047 | 0.053* | 1,136 |
| | (0.031) | (0.031) | (0.032) | |
| Education: MSc | -0.023 | -0.023 | 0.045 | 1,136 |
| | (0.037) | (0.037) | (0.038) | |
| Education: PhD | -0.056 | 0.018 | 0.038 | 1,136 |
| | (0.068) | (0.072) | (0.073) | |
| Marital Status: Single | 0.059* | 0.009 | -0.068** | 1,136 |
| | (0.030) | (0.030) | (0.031) | |
| Marital Status: In Relationship | -0.040 | -0.048 | 0.088*** | 1,136 |
| | (0.033) | (0.032) | (0.034) | |
| Marital Status: Divorced/Separated | -0.082 | 0.105* | -0.023 | 1,136 |
| | (0.052) | (0.058) | (0.055) | |
| Religion: None | -0.006 | -0.049 | 0.054 | 1,136 |
| | (0.035) | (0.034) | (0.036) | |
| Religion: Orthodox | 0.018 | 0.035 | -0.053 | 1,136 |
| | (0.032) | (0.032) | (0.033) | |
| Religion: Other | -0.053 | 0.028 | 0.026 | 1,136 |
| | (0.062) | (0.066) | (0.066) | |
| Family Income Above 20,000 | -0.010 | -0.020 | 0.030 | 1,136 |
| | (0.029) | (0.029) | (0.029) | |
| Political Beliefs: Left/Center-Left | -0.007 | -0.026 | 0.033 | 1,136 |
| | (0.029) | (0.029) | (0.029) | |
| Political Beliefs: Center | 0.013 | -0.023 | 0.010 | 1,136 |
| | (0.040) | (0.039) | (0.040) | |
| Political Beliefs: Right/Center-Right | -0.023 | 0.037 | -0.014 | 1,136 |
| | (0.033) | (0.033) | (0.033) | |
| Political Beliefs: Not Interested | 0.021 | 0.009 | -0.030 | 1,136 |
| | (0.032) | (0.032) | (0.032) | |
| Response during Religious Holiday | 0.014 | -0.046 | 0.032 | 1,136 |
| | (0.031) | (0.030) | (0.031) | |

Notes: The table shows the relationship between each treatment arm and the reported observable characteristic. Coefficients are estimated from regressions of each covariate on treatment indicators. Robust standard errors are shown in

Table A4: Treatment Effects on Religiosity Outcomes

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Importance of God | | | | Desire to Pray Often | |
| | Raw | | Standardized | | | |
| Religious Nudge | -0.082 | -0.105 | -0.022 | -0.029 | -0.020 | -0.009 |
| | (0.073) | (0.074) | (0.020) | (0.020) | (0.026) | (0.025) |
| Scientific Nudge | -0.157** | -0.168** | -0.043** | -0.045** | -0.064** | -0.058** |
| | (0.080) | (0.080) | (0.022) | (0.022) | (0.027) | (0.027) |
| Mean | 5.02 | 5.02 | -0.01 | -0.01 | 0.34 | 0.34 |
| SD | 3.77 | 3.77 | 1.02 | 1.02 | 0.47 | 0.47 |
| Individuals | 1,136 | 1,136 | 1,136 | 1,136 | 1,136 | 1,136 |
| Baseline Religiosity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Controls | | ✓ | | ✓ | | ✓ |

Notes: The table presents OLS estimates of religious and scientific nudges on the importance of God and the desire to pray often. Dependent variables are post-treatment measures of the importance of God (raw: 0–10 scale and standardized: mean =0 and SD = 1) and desire to pray often (binary indicator, = 1 if participants pray once or more than once a week, and 0 otherwise). The omitted category is the control group, which received no nudge. "Baseline Religiosity" is the baseline raw importance of God (measured at the beginning of the survey and before the treatment was administered) and is included in all specifications. "Controls" include respondent age (years) and indicators for respondent gender (male/female/other), education (high school/BSc/MSc/PhD), relationship status (single/married or long-term relationship/other), family income (above/below median), and religion (no religion/orthodox/other). Robust standard errors are reported. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

Table A5: Effect of the Treatment on Praying Frequency, Logit Model

| | (1) | (2) |
|---|---|---|
| | Desire to Pray Often | |
| Religious Nudge | -0.007 | -0.006 |
| | (0.025) | (0.024) |
| Scientific Nudge | -0.053** | -0.057** |
| | (0.025) | (0.026) |
| Mean | 0.34 | 0.34 |
| SD | 0.47 | 0.47 |
| Individuals | 1,136 | 1,136 |
| Baseline Religiosity | ✓ | ✓ |
| Controls | | ✓ |

Notes: The table presents average marginal effects from logit models of the religious and scientific nudges on the desire to pray often (binary). The omitted category is the control group. "Baseline Religiosity" is the baseline raw importance of God (measured at the beginning of the survey and before the treatment was administered) and is included in all specifications. "Controls" include respondent age (years) and indicators for respondent gender (male/female/other), education (high school/BSc/MSc/PhD), relationship status (single/married or long-term relationship/other), family income (above/below median), and religion (no religion/orthodox/other). Robust standard errors are reported. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

Table A6: Effect of the Treatment on the Importance of God and Praying Frequency—Only for Respondents Who Believe in God

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Importance of God | | | | Desire to Pray Often | |
| | Raw | | Standardized | | | |
| Religious Nudge | -0.087 | -0.111 | -0.024 | -0.030 | -0.014 | -0.006 |
| | (0.095) | (0.096) | (0.026) | (0.026) | (0.036) | (0.036) |
| Scientific Nudge | -0.224** | -0.251** | -0.061** | -0.068** | -0.077** | -0.070* |
| | (0.101) | (0.104) | (0.028) | (0.028) | (0.036) | (0.036) |
| Mean | 6.98 | 6.98 | 0.52 | 0.52 | 0.48 | 0.48 |
| SD | 2.73 | 2.73 | 0.74 | 0.74 | 0.50 | 0.50 |
| Individuals | 786 | 786 | 786 | 786 | 786 | 786 |
| Baseline Religiosity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Controls | | ✓ | | ✓ | | ✓ |

Notes: The table presents OLS estimates of treatment effects on religiosity and attitudes only for respondents who state that they believe in God. Dependent variables are post-treatment measures of importance of God (0–10 scale) and desire to pray often (binary). The omitted category is the control group. "Baseline Religiosity" is the baseline raw importance of God (measured at the beginning of the survey and before the treatment was administered) and is included in all specifications. "Controls" include respondent age (years) and indicators for respondent gender (male/female/other), education (high school/BSc/MSc/PhD), relationship status (single/married or long-term relationship/other), family income (above/below median), and religion (no religion/orthodox/other). Robust standard errors are reported. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

Table A7: Placebo Check: Effect of Treatments on Probability of Being Vaccinated and Political Ideology

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | Vaccination | | Politically Polarized | |
| Religious Nudge | -0.036 | -0.020 | -0.024 | -0.011 |
| | (0.025) | (0.024) | (0.032) | (0.032) |
| Scientific Nudge | 0.001 | 0.011 | -0.041 | -0.031 |
| | (0.024) | (0.024) | (0.032) | (0.032) |
| Mean | 0.88 | 0.88 | 0.29 | 0.29 |
| SD | 0.33 | 0.33 | 0.45 | 0.45 |
| Individuals | 1,136 | 1,136 | 1,136 | 1,136 |
| Baseline Religiosity | ✓ | ✓ | ✓ | ✓ |
| Controls | | ✓ | | ✓ |

Notes: The table presents OLS estimates of the religious and scientific nudges on participant preferences for vaccination and a binary indicator for being politically polarized. Dependent variables are post-treatment binary variables for whether the respondent is vaccinated against COVID-19 (takes the value of 1 if the participant is vaccinated and 0 otherwise) and whether the respondent is politically polarized (takes the value of 1 if the participant is politically polarized and 0 otherwise). The omitted category is the control group. "Baseline Religiosity" is the importance of God measured before the treatment was administered and is included in all specifications. "Controls" include respondent age (years) and indicators for respondent gender (male/female/other), education (high school/BSc/MSc/PhD), relationship status (single/married or long-term relationship/other), family income (above/below median), and religion (no religion/orthodox/other). Robust standard errors are reported. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

Table A8: Effect of the Treatment on Support for Immigrants, Willingness to Take Revenge, and Religious Beliefs

Panel A: Effect on Support for Immigrants and Willingness to Take Revenge

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Support for | | Willingness to | | | | | |
| | Immigrants | | Take Revenge | | Punish (Self) | | Punish (Others) | |
| Religious Nudge | 0.029 | 0.046 | 0.100 | -0.045 | -0.093 | -0.213 | -0.261 | -0.274 |
| | (0.033) | (0.033) | (0.199) | (0.196) | (0.206) | (0.205) | (0.197) | (0.198) |
| Scientific Nudge | 0.070** | 0.081** | 0.155 | 0.073 | -0.154 | -0.242 | -0.180 | -0.206 |
| | (0.033) | (0.032) | (0.201) | (0.199) | (0.205) | (0.203) | (0.193) | (0.195) |
| Mean | 0.35 | 0.35 | 4.39 | 4.39 | 4.85 | 4.85 | 5.28 | 5.28 |
| SD | 0.48 | 0.48 | 2.73 | 2.73 | 2.85 | 2.85 | 2.72 | 2.72 |
| Individuals | 1,136 | 1,136 | 1,136 | 1,136 | 1,136 | 1,136 | 1,136 | 1,136 |

Panel B: Effect on Supernatural Beliefs

| | Belief in the Existence of | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | God | | Afterlife | | Hell | | Paradise | |
| Religious Nudge | -0.021 | -0.038* | 0.033 | 0.022 | 0.019 | 0.010 | 0.026 | 0.011 |
| | (0.021) | (0.020) | (0.032) | (0.032) | (0.028) | (0.028) | (0.027) | (0.027) |
| Scientific Nudge | -0.018 | -0.029 | -0.008 | -0.009 | -0.023 | -0.025 | -0.009 | -0.016 |
| | (0.022) | (0.020) | (0.033) | (0.033) | (0.029) | (0.029) | (0.028) | (0.028) |
| Mean | 0.69 | 0.69 | 0.47 | 0.47 | 0.29 | 0.29 | 0.40 | 0.40 |
| SD | 0.46 | 0.46 | 0.50 | 0.50 | 0.46 | 0.46 | 0.49 | 0.49 |
| Individuals | 1,136 | 1,136 | 1,136 | 1,136 | 1,136 | 1,136 | 1,136 | 1,136 |
| Baseline Religiosity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Controls | | ✓ | | ✓ | | ✓ | | ✓ |

Notes: This table presents OLS estimates of treatment effects on attitudes. Dependent variables are post-treatment measures of support for immigrants (binary, takes value one if attitudes towards immigrants are positive or very positive), willingness to take revenge (0-10), willingness to punish someone as a consequence of damage to yourself (0-10), willingness to punish someone as a consequence of damage to someone else (0-10), and whether the respondent believes in God (binary), the afterlife (binary), hell (binary), and paradise (binary). The omitted category is the control group. "Baseline Religiosity" is the baseline raw importance of God (measured at the beginning of the survey and before the treatment was administered) and is included in all specifications. "Controls" include respondent age (years) and indicators for respondent gender (male/female/other), education (high school/BSc/MSc/PhD), relationship status (single/married or long-term relationship/other), family income (above/below median), and religion (no religion/orthodox/other). Robust

Table A9: Treatment Effect on Attitudes Toward Civil Rights and Religious Openness

Panel A: Effect on Support for Homosexual Marriage, Abortion, and Premarital Sex

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Support for | | | | | |
| | Same Sex Marriage | | Abortion | | Premarital Sex | |
| Religious Nudge | 0.166 | 0.132 | -0.361* | -0.331* | -0.058 | -0.097 |
| | (0.213) | (0.199) | (0.206) | (0.200) | (0.146) | (0.145) |
| Scientific Nudge | -0.063 | -0.083 | -0.079 | -0.029 | 0.092 | 0.065 |
| | (0.214) | (0.198) | (0.201) | (0.193) | (0.147) | (0.148) |
| Mean | 7.76 | 7.76 | 7.38 | 7.38 | 9.20 | 9.20 |
| SD | 3.27 | 3.27 | 3.06 | 3.06 | 2.09 | 2.09 |
| Individuals | 1,117 | 1,117 | 1,129 | 1,129 | 1,131 | 1,131 |

Panel B: Effect on Support for Homosexuals, Religion over Science, and Religious Openness

| | Support for | | Religious Dogmatism | | | |
|---|---|---|---|---|---|---|
| | Homosexuals | | vs Science | | vs Other Religions | |
| Religious Nudge | 0.006 | 0.010 | -0.029 | -0.020 | -0.070 | -0.037 |
| | (0.032) | (0.030) | (0.047) | (0.048) | (0.052) | (0.050) |
| Scientific Nudge | 0.001 | 0.006 | 0.003 | 0.005 | 0.004 | 0.020 |
| | (0.032) | (0.031) | (0.049) | (0.049) | (0.054) | (0.051) |
| Mean | 0.61 | 0.61 | 1.79 | 1.79 | 1.70 | 1.70 |
| SD | 0.49 | 0.49 | 0.75 | 0.75 | 0.80 | 0.80 |
| Individuals | 1,136 | 1,136 | 1,126 | 1,126 | 1,124 | 1,124 |
| Baseline Religiosity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Controls | | ✓ | | ✓ | | ✓ |

Notes: This table presents OLS estimates of treatment effects on attitudes. Dependent variables are post-treatment measures of how justified are same sex marriage (0-10), abortion (0-10), premarital sex (0-10), support for homosexuals (binary, takes value 1 if attitudes toward homosexuals are positive or very positive), and how much they agree with the statements "When Religion and Science are in conflict, I trust religion" and "I think my religion is the only acceptable religion" (1-4, from strongly disagree to strongly agree). The omitted category is the control group. "Baseline Religiosity" is the baseline raw importance of God (measured at the beginning of the survey and before

Table A10: Heterogeneity by Baseline Religiosity

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | Importance of God | | Desire to Pray Often | |
| | Below Median | Above Median | Below Median | Above Median |
| Religious Nudge | -0.158 | 0.001 | -0.021 | 0.016 |
| | (0.106) | (0.093) | (0.022) | (0.047) |
| Scientific Nudge | -0.151 | -0.174 | -0.009 | -0.121** |
| | (0.108) | (0.121) | (0.025) | (0.047) |
| Mean | 2.18 | 8.54 | 0.07 | 0.67 |
| SD | 2.38 | 1.55 | 0.26 | 0.47 |
| Individuals | 629 | 507 | 629 | 507 |
| Baseline Religiosity | ✓ | ✓ | ✓ | ✓ |
| Controls | ✓ | ✓ | ✓ | ✓ |

Notes: This table presents OLS estimates of treatment effects on religiosity and attitudes. Dependent variables are post-treatment measures of the importance of God (0–10 scale), and desire to pray often (binary). The heterogeneity variable is whether the importance of God, which was measured before the treatment was administered is below or above the median. The omitted category is the control group. "Baseline Religiosity" is the baseline raw importance of God (measured at the beginning of the survey and before the treatment was administered) and is included in all specifications. "Controls" include respondent age (years) and indicators for respondent gender (male/female/other), education (high school/BSc/MSc/PhD), relationship status (single/married or long-term relationship/other), family income (above/below median), and religion (no religion/orthodox/other). Robust standard errors are reported. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels

Table A11: Heterogeneity by Demographic Characteristics

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Median Age | | Gender | | BSc Education | | Income Above 20,000 | |
| | Below | Above | Male | Female | Below | Above | Below | Above |
| **Panel A: Importance of God** | | | | | | | | |
| Religious Nudge | -0.009 | -0.188* | -0.077 | -0.134 | -0.130 | -0.074 | 0.069 | -0.143* |
| | (0.099) | (0.110) | (0.091) | (0.129) | (0.113) | (0.100) | (0.158) | (0.082) |
| Scientific Nudge | -0.088 | -0.242** | -0.140 | -0.208 | -0.140 | -0.175 | -0.380** | -0.138 |
| | (0.103) | (0.121) | (0.098) | (0.136) | (0.111) | (0.113) | (0.181) | (0.091) |
| Mean | 4.91 | 5.11 | 5.25 | 4.66 | 5.04 | 5.12 | 4.83 | 5.08 |
| SD | 3.51 | 3.96 | 3.68 | 3.90 | 3.71 | 3.80 | 3.86 | 3.75 |
| Individuals | 573 | 553 | 717 | 409 | 517 | 609 | 233 | 893 |
| **Panel B: Desire to Pray Often** | | | | | | | | |
| Religious Nudge | 0.073* | -0.080** | 0.008 | -0.028 | 0.002 | -0.012 | -0.058 | 0.012 |
| | (0.037) | (0.035) | (0.034) | (0.039) | (0.039) | (0.034) | (0.060) | (0.028) |
| Scientific Nudge | -0.053 | -0.043 | -0.057* | -0.059 | -0.051 | -0.061* | -0.094 | -0.046 |
| | (0.038) | (0.038) | (0.035) | (0.042) | (0.039) | (0.036) | (0.062) | (0.030) |
| Mean | 0.28 | 0.39 | 0.35 | 0.33 | 0.29 | 0.38 | 0.38 | 0.33 |
| SD | 0.45 | 0.49 | 0.48 | 0.47 | 0.46 | 0.49 | 0.49 | 0.47 |
| Individuals | 573 | 553 | 717 | 409 | 517 | 609 | 233 | 893 |
| Baseline Religiosity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Notes: This table presents OLS estimates of treatment effects on religiosity and attitudes. Dependent variables are post-treatment measures of the importance of God (0–10 scale) (Panel A) and desire to pray often (binary) (Panel B). Heterogeneity variables are age (below/above median), gender (male/female), education (below/above BSc), and family income (below/above 20,000 euros). The omitted category is the control group. "Baseline Religiosity" is the baseline raw importance of God (measured at the beginning of the survey and before the treatment was administered) and is included in all specifications. "Controls" include respondent age (years) and indicators for respondent gender (male/female/other), education (high school/BSc/MSc/PhD), relationship status (single/married or long-term relationship/other), family income (above/below median), and religion (no religion/orthodox/other). Robust standard errors are reported. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

Table A12: Heterogeneity by Demographic Characteristics (continuing)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Marital Status | | Religious Name | | Grandparent Name | | Response in Festivity | |
| | Relationship | Single | No | Yes | No | Yes | No | Yes |
| **Panel A: Importance of God** | | | | | | | | |
| Religious Nudge | -0.018 | -0.127* | 0.048 | -0.177** | 0.013 | -0.146* | -0.175** | 0.047 |
| | (0.191) | (0.076) | (0.170) | (0.080) | (0.176) | (0.081) | (0.085) | (0.141) |
| Scientific Nudge | -0.254 | -0.165** | -0.065 | -0.187** | -0.200 | -0.173** | -0.206** | -0.065 |
| | (0.227) | (0.080) | (0.174) | (0.090) | (0.192) | (0.088) | (0.092) | (0.154) |
| Mean | 6.09 | 4.61 | 4.40 | 5.23 | 4.76 | 5.10 | 4.62 | 5.91 |
| SD | 3.77 | 3.70 | 3.73 | 3.77 | 3.86 | 3.75 | 3.76 | 3.65 |
| Individuals | 265 | 861 | 325 | 787 | 245 | 881 | 792 | 334 |
| **Panel B: Desire to Pray Often** | | | | | | | | |
| Religious Nudge | -0.070 | 0.019 | 0.027 | -0.011 | -0.021 | 0.003 | 0.029 | -0.070 |
| | (0.056) | (0.029) | (0.043) | (0.032) | (0.050) | (0.029) | (0.030) | (0.048) |
| Scientific Nudge | -0.065 | -0.050* | -0.030 | -0.060* | -0.114** | -0.040 | -0.050 | -0.055 |
| | (0.061) | (0.029) | (0.046) | (0.033) | (0.056) | (0.030) | (0.031) | (0.053) |
| Mean | 0.44 | 0.30 | 0.25 | 0.37 | 0.33 | 0.34 | 0.30 | 0.43 |
| SD | 0.50 | 0.46 | 0.44 | 0.48 | 0.47 | 0.48 | 0.46 | 0.50 |
| Individuals | 265 | 861 | 325 | 787 | 245 | 881 | 792 | 334 |
| Baseline Religiosity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Notes: This table presents OLS estimates of treatment effects on religiosity and attitudes. Dependent variables are post-treatment measures of the importance of God (0–10 scale) (Panel A) and desire to pray often (binary) (Panel B). Heterogeneity variables are marital status (single/in a relationship), whether the participant has a religious first name (no/yes), whether the participant has their grandparents name (no/yes), and whether the participant responded during the month of a religious holiday (no/yes). The omitted category is the control group. "Baseline Religiosity" is the baseline raw importance of God (measured at the beginning of the survey and before the treatment was administered) and is included in all specifications. "Controls" include respondent age (years) and indicators for respondent gender (male/female/other), education (high school/BSc/MSc/PhD), relationship status (single/married or long-term relationship/other), family income (above/below median), and religion (no religion/orthodox/other). Robust standard errors are reported. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

# B Appendix: Survey Structure and Questionnaire (English Translation)

Researchers Dr. Rigissa Megalokonomou and Dr. Evangelos Dioikitopoulos invite you to participate in a study on measuring human preferences and needs. This study is conducted to better understand individuals' economic and social choices, with the aim of developing policies that will reduce income and social inequality, social exclusion, and discrimination observed among different regions of Greece. For every completed participation, you will enter a draw for several video projectors.

You have been invited to take part in this study because we believe you can contribute to the understanding of human behavior. In this study, you will be asked to complete an online questionnaire. The first section will cover some demographic questions. The second part will ask about your preferences and beliefs regarding various social issues, such as religiosity.

No question is mandatory, although answering would help in conducting the research. You may skip any question you do not feel comfortable answering, and the questionnaire will be fully anonymized, making it impossible to identify you.

Your participation is entirely voluntary. You may refuse to participate without providing any reason. Even if you agree to participate, you may withdraw at any time without any consequences. In that case, you may request that your data and information be deleted, and your request will be honored immediately. Personal data may be deleted at any time. In summary, participants are free at any point until the end of the program to decline participation or withdraw consent without negative consequences and without needing to justify their decision. In such cases, their personal data will be destroyed.

Participation will not take more than 10–15 minutes. The study has received approval from the Ethics Committee of the Athens University of Economics and Business, approval code **ΕΥΔ-5/06102023**.

Your participation does not involve any cost or burden apart from the time spent. Refusal or withdrawal of consent will not have any adverse consequences for you.

If you have any questions about the questionnaire, or if you want your personal data or information you have provided to be deleted, you may contact the researchers at:

- rigissa.megalokonomou@monash.edu
- edioik@aueb.gr

If you agree to participate in this study, please select:

☐ **Agree**

☐ **Disagree**

**Block 1: Baseline Respondent Characteristics**

1. What is your gender?
    - Man
    - Woman
    - Non-binary
    - Prefer not to say
2. What is your year of birth?
   *(Dropdown selection: e.g., 1985)*
3. This means you are _____ years old (write your age in two digits).
4. What is your marital status (you should give one answer)?
    - Single
    - Married
    - Cohabiting
    - Divorced
    - Separated
    - Widowed
    - Prefer not to say

5. What is the highest education level you have attained?
    - Some primary school grades
    - Primary school certificate
    - 3-year middle-school certificate
    - Secondary school certificate (high-school diploma)
    - Institute of Vocational Training (IEK)
    - Diploma from Technological Educational Institute (TEI)
    - Studies for at least 1 year at university, but no degree
    - University degree
    - Master's degree
    - PhD
    - Prefer not to say
6. What is your city of residence (e.g., Kallithea, Attica)? _____
7. What is your father's prefecture of origin? *(Dropdown selection)* _____
8. What is your mother's prefecture of origin? *(Dropdown selection)* _____
9. What is your city/town of origin (e.g., Piraeus, Attica)? _____
10. What is your annual net household income (approximately)?
    - €0–9,999
    - €10,000–19,999
    - €20,000–29,999
    - €30,000–39,999

- €40,000–49,999
- €50,000–59,999
- €60,000–69,999
- €70,000+
- Don't know

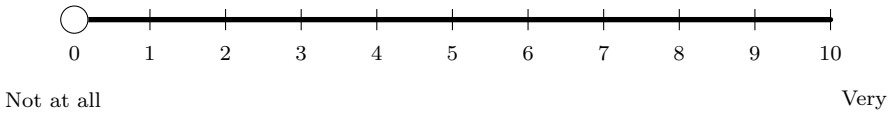
11. What is your formal first name (for example, report Eleni instead of Lena, i.e., avoid nicknames)? _____

12. Is your first name the same as your grandfather's or grandmother's?
    - Yes
    - No

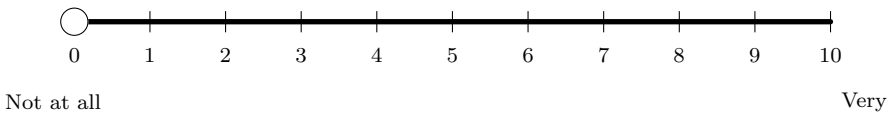
13. If *No*, what was your grandparent's first name? _____

14. Do you belong to a religion? If yes, which?
    - None
    - Roman Catholic
    - Protestant
    - Orthodox
    - Jewish
    - Muslim
    - Hindu
    - Buddhist
    - Prefer not to answer

15. How important is God in your life? (use the slider below, where 0 means 'not at all important' and 10 means 'very important').




16. It is difficult for me to forgive others for their mistakes. (use the slider below, where 0 means 'not at all difficult' and 10 means 'very difficult').

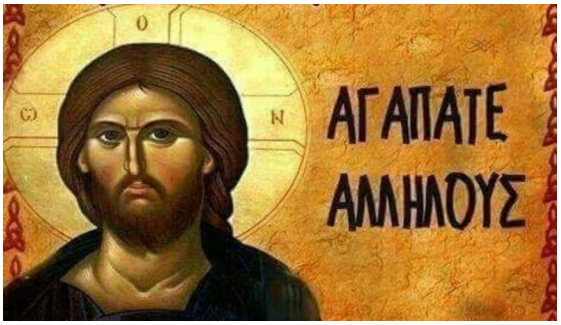


**Block 2: Randomization Blocks**

(In each treatment block, participants receive a random treatment in which only the questions related to the allocated treatment are displayed. A participant receives only one treatment: the religious nudge [Treatment 1], the scientific nudge [Treatment 2], or no nudge [Treatment 3].)

Below is a photo we found online that we use for research purposes. The following questions relate to your social and religious beliefs.

[**Beginning of Treatment 1 — Religious Nudge**]




**Jesus Christ taught us to:**

- Love one another (John 13:35)
- Love your enemies (Luke 6:27–28)

[**End of Treatment 1**]

[**Beginning of Treatment 2 — Scientific Nudge**]

"Research from the University of California concludes that people can increase their happiness through simple positive activities, such as expressing gratitude or interacting with other people (Lyubomirsky & Layous, 2013)."

**[End of Treatment 2]**

**[Beginning of Treatment 3 — No Nudge]**

**[End of Treatment 3]**

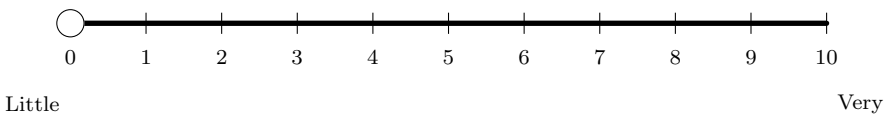
[The following questions appear to all participants.]

17. Ideally, how often would you like to pray?*(Single choice)*

    - Never/almost never

- Rarely
- Once a year
- Only on special religious holidays
- Only when attending religious services
- Several times a week
- Once a day
- Several times a day

18. How important is God in your life?




## B.1 More Religiosity Questions

19. Which of the following, if any, do you believe in? *(Select Yes or No for each option.)*

| | **Yes** ☐ | **No** ☐ |
|---|---|---|
| God | ☐ | ☐ |
| Afterlife | ☐ | ☐ |
| Hell | ☐ | ☐ |
| Heaven | ☐ | ☐ |

20. Please tell us whether you strongly agree, agree, disagree, or strongly disagree with the following statements (choose the one that best represents you):

| | **Strongly agree** | **Agree** | **Disagree** | **Strongly disagree** |
|---|---|---|---|---|
| Whenever science and religion conflict, religion is always right. | ☐ | ☐ | ☐ | ☐ |
| The only acceptable religion is my religion. | ☐ | ☐ | ☐ | ☐ |

21. Apart from weddings and funerals, how often do you attend church nowadays?

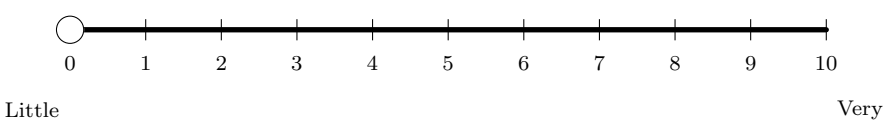
- Never/almost never
- Rarely
- Once a year
- Only on special religious holidays
- Once a month
- Once a week
- More than once a week

22. For each of the following actions, indicate whether you think it is never justified, always justified, or somewhere in between.

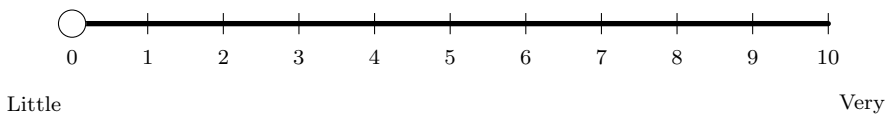
*(0 = never justified, 10 = always justified)*

Abortion

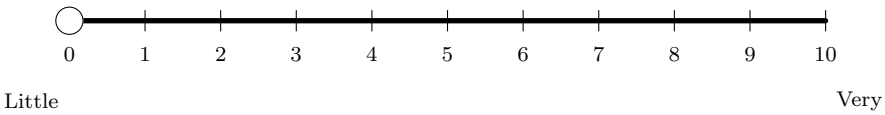

Premarital Sex



Homosexuality




23. It is difficult for me to forgive others for their mistakes.




24. Were you vaccinated against COVID–19?

    - Yes
    - No

25. Which political ideology best represents you?

    - Left
    - Centre-left
    - Centre
    - Centre-right
    - Right
    - No ideology / not interested in politics

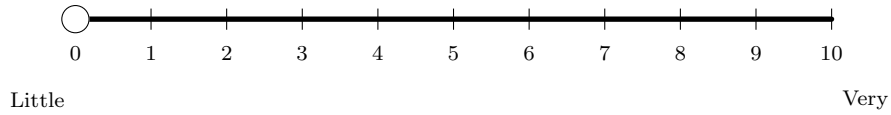
26. What is your attitude toward immigrants in our country? *Please select the response that best reflects your view:*

    - Very positive
    - Positive
    - Neutral
    - Negative
    - Very negative

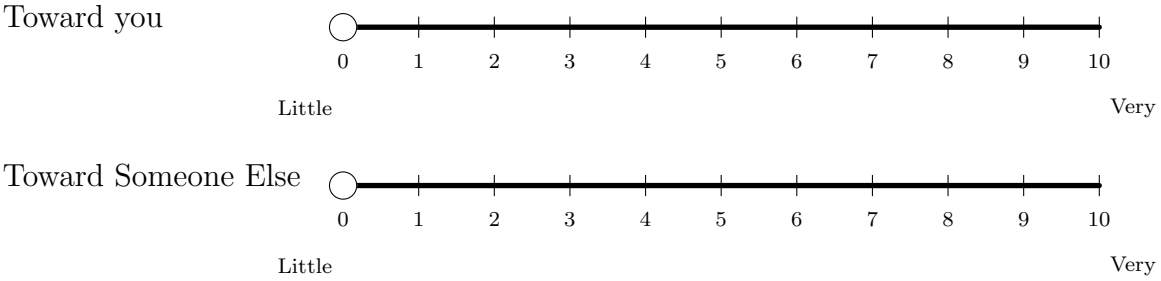
27. What is your position on legalizing same-sex marriage?

- Strongly support
- Somewhat support
- Neutral
- Somewhat oppose
- Strongly oppose

28. How willing are you to take revenge if you are treated very unfairly?

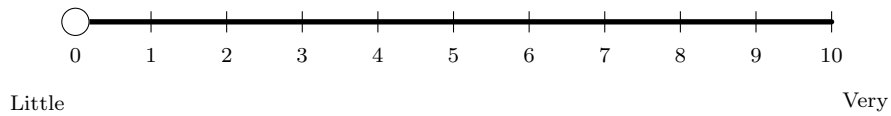



29. How willing are you to punish a person for unfair behavior?

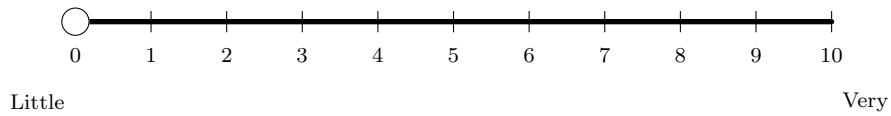



**Block 3: Preferences**

30. In your choices, how much do you compare yourself to others?




31. Compared with others, how willing are you to sacrifice today to benefit in the future?




**Block 4: Conclusion**

32. If you would like to enter the draw for several projectors and be included in similar studies (some with monetary payment), please provide your contact details below:

    - Mobile phone: _____