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UNDER BIG GODS' EYES. THE IMPACT OF RELIGIOUS BELIEFS ON ALTRUISTIC PUNISHMENT DURING COVID-19 PANDEMICY

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Under Big Gods' Eyes. The Impact of Religious Beliefs on Altruistic Punishment During COVID-19 Pandemic

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Abstract

We investigate whether and how the "Big Gods hypothesis" influences individuals' punitive behaviors in response to non-compliance with COVID-19 norms. Prior studies have demonstrated that religious priming enhances prosocial behavior, with religious primes encouraging individuals to punish unfair behavior for maintaining their reputation with a supernatural agent. Our study uses original survey data from the USA to examine how the intensity of religious life correlates with increased punishment of norm violators. Our findings show that individuals who spend more time on religious practices, particularly when compared to atheists or agnostics, believe it is right to punish those who break COVID-related rules and are more likely to punish the transgressors. Additionally, we observe that believers in faiths like Islam and Catholicism exhibit stronger tendencies toward punitive actions than non-believers, though these effects weaken when moderated by other factors.

Keywords and phrases: Religious beliefs; COVID-19; Prosocial Behavior; Altruistic Punishment.
JEL Codes: C83, D91; I12; Z12.

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> *"Historically and temporarily, cultures differ in their conceptions of whether, and to what degree, Gods know or care about human affairs, and importantly, if they do care, what particular domains of human activities they care about. As we shall see, one idea—Big, powerful, interventionist Gods—culturally spread at the expense of rival ideas because these Gods could take on supernatural monitoring duties, allowing societies to expand their cooperative reach"* (Norenzayan, 2013, p. 19).

1 Introduction

How do religious beliefs interact with secular motivations to shape individual and collective economic behavior? That is the main question at the center of the growing field of the economics of religion. Early work by Azzi and Ehrenberg (1975) and Iannaccone (1990, 1992) applied rational choice theory and considered religious participation as an investment in "religious capital" and costly rituals as mechanisms to deter free-riding and strengthen group cohesion. Barro and McCleary (2003) demonstrated how religiosity influences economic growth by promoting trust and work ethic, noting a non-linear relationship where moderate religiosity is optimal. Also, Seabright (2010, 2024) highlighted religion's role in fostering altruism and trust through moral narratives, which are crucial for economic cooperation. These findings, as well as many others that followed these seminal contributions, have established the importance of religion in understanding economic attitudes and institutions.

In this line, one of the most recent and influential ideas is the interaction between people's behavior and their belief in the so-called "Big Gods" (Norenzayan, 2013; Voigt, 2024). Big Gods are supernatural entities believed to have created or governed all reality, intervened in human affairs, and enforced or supported human morality. These entities are characterized, in fact, by their central concern with human morality, broad moral jurisdiction, and significant powers, such as retribution in the afterlife (Fitouchi et al., 2022b). The concept of Big Gods encompasses beliefs in powerful, moralizing deities that play a crucial role in shaping social norms, fostering cooperation, and influencing human behavior not only within religious contexts. Indeed, Big Gods demand adherence to their moral codes, which people commit through costly rituals and displays of loyality, facilitating the rise of cooperation in large groups of anonymous strangers threatened them with punishment in the afterlife. The "Big Gods hypothesis", by recurring to the idea of a moralizing and omniscient god, explains how large and anonymous societies promoted cooperation through the fear of divine punishment by mitigating the free-rider problem.

This study aims to measure the impact of beliefs in an omniscient moralizing god and people's behavior considering the scenario of COVID-19 when efforts to contain the virus and its

deadly consequences necessitates the rapid emergence of new forms of voluntary cooperation. More specifically, we are interested in exploring whether believers in major religions differ from others in their attitude towards the punishment of free riders. The Big Gods hypothesis may, in fact, suggest that religious individuals may prefer to leave the responsibility of punishment to God rather than intervene directly, or conversely, that they tend to punish non-compliant behavior more to maintain their moral standing with a supernatural agent.

Our data show that respondents with a strong religious faith, that is who devote a significant amount of time to religious activities believe that punishing rule-breakers is appropriate. In addition, we show that those who profess to be Catholic or Muslim and who devote more time to prayer or participation in religious rituals tend to actively punish non-compliance with rules of social distance more than atheists and agnostics do.

The remaining of the paper is structured as follows. Section two is dedicated to the theoretical and empirical background. Section three presents the questionnaire details, the handling of responses and variables, and the hypotheses to be tested. Section four presents the socio-demographic results and the econometric analysis. Finally, the discussion and conclusions close the paper.

2 The "Big Gods Hypothesis".

The "Big Gods hypothesis", first advanced by Joseph Henrich (2009, 2010) and Ara Norenzayan (2013), addresses a central question in the study of our cultural evolution: how did large, anonymous societies overcome the challenges of free-riding and succeeded in maintaining high levels of social cohesion and cooperation? In small-scale societies, cooperation is typically enforced through direct interpersonal monitoring, kinship bonds, and reputation management within closely knit groups. But as human societies expand beyond this scale, new mechanisms are required to maintain cooperative norms among strangers. Norenzayan and Henrich argue that beliefs in omniscient, morally concerned deities, referred to as "Big Gods", played a pivotal role by providing a form of supernatural monitoring and sanctioning that extended surveillance and repression beyond human limitations. According to their theory, these beliefs reduced the likelihood of norm violations by instilling the fear of divine punishment and encouraging pro-social behavior, including altruistic punishment, even in contexts where human enforcement mechanisms were limited or absent. The hypothesis is built on three main pillars. The first refers to the belief in some form of "supernatural surveillance", according to which an omniscient deity who monitors human behavior reduces the temptation to free-ride or break the group's rules. This heavenly monitoring is supposed to enforce moral norms, even in the absence of human witnesses, since people who believe a moralizing god is watching them are more likely to follow social norms and punish violations. Norenzayan et al. (2014) show that this fear creates a psychological deterrent against selfish or antisocial behavior. The belief in such a "supernatural surveillance" enabled cooperation to scale from small groups to large, anonymous societies by effectively extending the range of social monitoring beyond direct human observation. Henrich (2009) argues that societies with such beliefs outcompeted others because they were better at maintaining internal harmony

and collective action. The second pillar of the "Big Gods" hypothesis is "altruistic punishment", that is, the willingness to punish norm violators even at personal cost. The implementation of altruistic punishment is critical for the enforcement of social norms in large groups. The hypothesis suggests that religious beliefs amplify this behavior. The third pillar refers to "reputation management". Believing in an omniscient god who observes and judges all actions also ties into human concerns about reputation. This dynamic motivates individuals to behave pro-socially, even when the immediate benefits of cooperation or punishment are unclear.

There is convergent evidence that supports the "Big Gods hypothesis". From a historical viewpoint, societies that worshipped moralizing gods appear to have had greater social complexity and were more likely to expand territorially. For example, Watts et al. (2015) found that the spread of belief in moralizing gods correlated with the emergence of larger, politically centralized states. Many experimental studies support the hypothesis or one or more of its pillars (see Hoffman 2013 for an initial review). To address the problem of causality inherent to the observed correlation between religious beliefs and pro-sociality, many studies use ad hoc priming techniques (Shariff and Norenzayan 2007; Lane, 2020) or take advantage of naturally occurring religious primes, such as days of observance, as in Malhotra (2010), religious festivals, as in Akay et al. (2015) or the call to prayer used in Duhaime (2015). In recent years, numerous studies using these methods have found positive causal effects of religion on pro-sociality. Purzycki et al. (2016), for example, using extensive ethnographic interviews and two variants of the random allocation game with members of eight small-scale societies, found that the higher participants rated their moralistic gods as punitive and knowledgeable about human thoughts and actions, the fairer their choices in the two games. Shariff and Norenzayan (2007) conducted an experiment with a simple Dictator Game and found that when participants were primed with thoughts of a punitive god, they were more likely to implement fair distributions. Finally, Henrich et al. (2010) collected data from 15 diverse societies, ranging from small-scale hunter-gatherers to large, industrialized populations. Economic games, including the Dictator Game, the Ultimatum Game, and the Third-Party Punishment Game, were used to measure fairness and willingness to punish unfair behavior. They find that belief in moralizing gods was strongly associated with both increased fairness and a greater willingness to punish unfair behavior.

Many of these studies isolate the effect of different elements of religiosity on behavior. That disentangling exercise is of fundamental importance as the same person may behave pro-socially when in the place of worship and selfishly when elsewhere or on particular days or when reminded of certain aspects of their religious creed and no other. As highlighted by Ruffle and Sosis (2007), for example, who designed a field experiment to compare the behavior of individuals from religious and secular Israeli kibbutzim, one of the variables that better predict the participants' degree of cooperative behavior is the amount of time spent attending collective religious rituals.

While the "Big Gods hypothesis" has substantial empirical support, it has also faced criticism and challenges. Historical records show, for example, that not all cooperative societies have relied on moralizing gods. Many early religions centered on non-moralizing deities or spiritual forces that were not concerned with human morality. How these societies were able to sustain

cooperation remains an open question. A second set of criticism relates to the interaction between religious beliefs and secular norms. Critics argue that secular mechanisms, such as state laws, enforcement institutions, and social contracts, can achieve similar levels of cooperation without reliance on supernatural beliefs. Baumard and Boyer (2013) suggest that moral behavior can emerge from natural cognitive mechanisms and cultural evolution without the need for religious frameworks. In modern societies, in fact, the role of "Big Gods" has diminished as secular institutions (laws, police, surveillance technologies) have replaced religious mechanisms for enforcing cooperation. Norenzayan (2013) argues that secular substitutes can enforce cooperative norms in highly secular societies, though the transition is not without challenges.

As we have seen, one of the implications of the "Big Gods hypothesis" related to the fostering of social cooperation, refers to the willingness of believers to punish free riders. The implementation of a system of decentralized punishment benefits society, but as a sort of public good, it also imposes direct costs on the punishers themselves. It is, therefore, not surprising that individuals, as it is the case in many other forms of voluntary contribution mechanisms, may be tempted to punish less when others are also able to punish than when they are solely responsible for punishment. The belief that supernatural deities can identify and punish norm transgressors may have the same discouraging effect. This prediction may seem somewhat counterintuitive. As we have seen, in fact, religious beliefs are generally positively associated with both prosocial behavior and punishment (Unnever et al., 2005 and Grasmick et al. 1991), including altruistic punishment. However, the evidence on the link between believing in a "Big God" and altruistic punishment is scarce and mixed. Laurin et al. (2012), for example, find that, although religiosity generally predicts higher levels of punishment, the specific belief in powerful, intervening Gods reduces altruistic punishment as measured in the public-good game.

Taking advantage of the unique situation provided by the COVID-19 pandemic and focusing on a representative sample of the US population, we focus on the impact that religious beliefs may exert on people's attitudes toward two crucial elements: on the one hand, the willingness to comply with those rules and, on the other, the tendency to actively punish those who transgress them. More specifically, we investigate whether believing in a "Big God" may induce people to think of centralized supernatural punishment as a substitute for the secular decentralized altruistic punishment of free-riders or as a complement. We test, in fact, whether people who identify themselves as believers in Big Gods religions and spend time in religious activities such as rituals and prayers are more willing to engage in forms of altruistic punishment that strengthen the efficacy of legal rules or, on the contrary, they tend to leave, in force of their beliefs, the burden of punishing the non-compliers, to the deity.

During the COVID-19 pandemic, we had to address numerous challenges, many of which required different large-scale forms of cooperation. Several state governments imposed new behavioral rules to prevent or at least slow the spread of the virus, ranging from personal hygiene prescriptions to physical distancing measures. The role of trust and pro-sociality in promoting these forms of social cooperation (Min, 2020; Romano et al., 2021; Abel and

Brown, 2022; Haller et al., 2022) and of behavioral economics insights in helping to implement impactful policy measures has raised significant interest among social scientists (Dai, et al. 2021; Byrne-Davis et al., 2022;Van Lange, 2022; Ruggeri et al. 2023).

3 Survey and Hypotheses

The socio-economic questionnaire was administered between March and April 2020 to a representative sample of 1,212 U.S. citizens. The data collection period is particularly important because between March and early April that year, several US states, cities, and counties, imposed home quarantines (or closures) on their populations to contain the spread of the virus.

After data cleaning, the sample was reduced to 1200 observations (six pairs of observations were identified as having identical IP values, resulting in their being excluded from the analysis). Subjects answered 42 questions ranging from socio-demographic questions to religious beliefs and practices, from agreement with quarantine and other anti-pandemic measures to direct behaviors to punish the transgressors (see appendix C for the questionnaire).

To optimize the responses, the dataset was subject to some adjustments. We classified as missing: two non-binary subjects (for gender variable) as too few to provide reliable estimates; two subjects who responded to marital status as secular; those who do not know/do not practice any spiritual activity in their religion (or if they are atheists); those who answered, "prefer not to say" (for several questions).

Concerning religious beliefs, we classified as "Other Christians" those who answered to be "Jehovah's Witnesses", "Orthodox", "born-again", "Apostolic", "Unitarian", "Seventh-day Adventist", or "Christian" without any other specification and as "Protestant" those who stated to be "Baptist", "Lutheran", "Mormon", "Pentecostal", "Methodist", "Evangelical", and "Non-denominational Christians".

As for the questions related to the same topic and with the same Likert scale (e.g., trust, rule-following, attitude, time spent in prayer), we first checked that they were correlated with each other by using Cronbach's alpha (which was always found to be high and above 0.79). Subsequently, we aggregated and divided by the number of these variables, obtaining an index representing the mean value.

We aim to test two general hypotheses related to the impact of religiosity on altruistic punishment. In particular, we use both a self-reported measure of the strength of belief and the amount of time spent on religious activities such as worship, participation in rituals, and praying, to identify both religious attitudes and behaviors and investigate the correlations between those measures and, on the one hand, the agreement with the necessity to punish transgressors and, on the other, with the implementation of actual forms of punishment.

4 Results

4.1 The Sample

The descriptive statistics on demographics by religious beliefs are summarized in Table 1. Most of the sample (79.65%) were born in the United States of America. Regionally, 37.17% live in the South, 23.42% in the West, 21.67% in the Midwest, and 17.75% in the Northeast. Regarding religious beliefs, 34.08% identify as Catholic, 28% as Protestant, 11.17% as Agnostic, 7.50% as Atheist, 4.50% as Muslim, and 2.42% as Jewish (Q10). Additionally, 8.17% are other Christians, and 4.17% belong to other religions.

The demographic characteristics of individuals vary across religious beliefs. Gender (Q2) distribution also differs, with an overall male representation of 48%, but men are overrepresented among Muslims (83%) and Jews (66%). The average age (Q3) is 41, with Protestants the oldest (46.05 years) and Muslims the youngest (34.46 years). Educational attainment (Q8) varies, with Catholics having the highest percentage of individuals with graduate education (65%) and Agnostics the lowest (48%). Employment rates are highest among Catholics and Muslims (both 65%) and lowest among Atheists (49%). Marital status also shows variation, with Catholics having the highest percentage of married individuals (63%) and Agnostics the lowest (39%).

Psychological, Behavioral, and Attitudinal Characteristics are summarized in Table 2.

- Political Orientation (Q12). The political orientation (-1=Republican; 0=Independent; 1=Democrat) varies across religious beliefs. On average, 35% identify as Republicans, 26% as Independents, and 39% as Democrats. Protestants and Catholics lean Republican (48% and 41%), while Agnostics, Jews, and those of Other Religions lean Democrats (50%, 52%, and 48%). Atheists and Muslims also lean towards Democrats but to a lesser extent. A significant difference exists in political orientation also between believers and non-believers, with believers being more Republican and non-believers (t-test, $p < 0.001$).

Table 1. Mean Demographics Statistics by Religious Beliefs.

Religious Beliefs	Age	Male	Graduate	Employed	Married	N	Percentage
Atheist	38.34	.53	.59	.49	.42	90	7.50
Agnostic	40.28	.40	.48	.51	.39	134	11.17
Catholic	38.80	.56	.64	.65	.63	409	34.08
Protestant	46.05	.36	.52	.52	.55	324	28.00
Muslim	34.46	.83	.63	.65	.61	54	4.50
Jew	43.04	.66	.62	.62	.48	29	2.42
Other Christians	39.18	.35	.37	.41	.43	99	8.17
Other religion	40.40	.49	.51	.51	.43	61	4.17
Average	40.93	.48	.56	.56	.54		

- Institutional Trust (Q13). Considering the average of the individual levels of trust in different institutions (excluding from the original question the dimension of church and people), we see that Muslims score higher than the overall mean (6.98 vs. 6.19), while Agnostics exhibit a lower level (4.37). As for every single institution, Muslims, Catholics, and Protestants report a trust value in the President higher than 6 (out of 10), while agnostics reported the lowest value (3.05). Also, Muslims report higher trust in Congress, the federal and regional governments, and political parties, while slightly higher is that of Catholics for local government. In general, agnostics have the lowest level of trust for all dimensions described previously. Catholics, Protestants, and Muslims also have the highest trust in law enforcement, health service, and the military, with values almost always above 7 (out of 10). In contrast, agnostics have on average, the lowest level, followed by atheists (always below 6).
- Interpersonal Trust (Q14). Regarding trust in people (from 0 to 1), Muslims have the highest values (0.38), followed by agnostics (0.27) and Jews (0.24) for an overall average of 0.24. Considering trust as an average of all these dimensions, the difference between believers and not is statistically significant, also considering all the religions categories using a Dunn test with Bonferroni correction for multiple comparisons (t-test, $p < 0.001$). The same goes for differences with agnostics.
- Attention to Rules (Q23). Catholics pay higher attention to COVID-19 rules[1] than the overall mean (8.47 vs. 8.18), while Protestants exhibit a slightly lower level (8.23 vs. 8.18). Regarding the difference in averages of compliance between religions, only Catholics and other Christians have a statistically significant difference between atheists (t-test, $p < 0.01$) and agnostics ($p < 0.001$) using a Dunn test for multiple comparisons corrected for Bonferroni.
- Time Dedicated to Religion (Q29). The time dedicated to religion is an average based on three dimensions: personal prayer frequency, communal ritual frequency, and community prayer frequency. The average differs among religious beliefs: Muslims and Catholics spend significantly more time dedicated to religion than the overall mean (6.98 and 6.13 vs. 5.43), while Jews spend significantly less time (3.70 vs. 5.43). This should not be surprising as the Islamic religion requires a much more rigid and communal daily ritual than Catholics and Jews.

The result of convergent validity (CV) test, which confirm the construct model and item's efficacy and reliability, are shown in

Table 2. Three indices are examined in the test: Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). Cronbach's alpha and CR reflect reliability and internal consistency. According to Leontitsis and Pagge (2007), Cronbach's alpha value should be greater than 0.5, and the CR value should be at least 0.7 (Afthanorhan, 2013). AVE

[1] This is an average value of the answers to the question: "On a scale of 1 to 10, how carefully do you respect the rules of social distancing and health prevention?" Categories are: "Staying indoors"; "Washing my hands frequently"; "Disinfecting all surfaces"; "Respecting a social distance of at least 1 meter"; "Wearing protection".

represents the entire latent variable explanatory power for all measured variables. 0.5 is the AVE cut-off value (Afthanorhan, 2013). All constructs satisfy the CV requirements.

Table 2. Average Differences by Religious Belief.

Religious Beliefs	Pol. Orientation	Institutional Trust	Interpersonal Trust	Attention to rules	Time for religion
Atheist	0.22	5.16	0.24	7.54	-
Agnostic	0.40	4.51	0.27	7.65	2.86
Catholic	-0.03	6.79	0.24	8.47	6.13
Protestant	-0.13	6.26	0.23	8.23	5.35
Muslim	0.08	7.00	0.38	8.11	6.98
Jew	0.33	5.47	0.26	7.69	3.70
Other Christians	-0.08	5.48	0.25	8.01	5.18
Other religions	0.45	5.34	0.19	8.66	4.93
Total	0.04	6.08	0.24	8.18	5.43
Cronbach's Alpha	//	0.925	//	0.909	0.843
Composite Reliability	//	0.911	//	0.781	0.852
AVE	//	0.510	//	0.540	0.664

Note: Political orientation and Interpersonal Trust don't have any value for the Reliability and Validity Metrics because they are single questions.

Summarizing, the data suggests that religious individuals (especially Muslims, Catholics, and Protestants) tend to report higher institutional trust, greater adherence to rules, and more time spent on religion compared to non-religious groups like Atheists and Agnostics. Political orientation varies significantly, with religious groups tending towards conservatism and non-religious groups leaning liberal.

4.2 COVID-19-Related Behaviors and Outcomes

Table 3 reports the respondents' attitudes, by religious belief, towards the appropriateness (Q21), usefulness (Q22) of the measures implemented by the authorities, the desired frequency of control (Q20), and whether they have experienced the diseases (Q38). Muslims and Catholics individuals exhibit the firmest belief in proper quarantine.

Table 3. Average Differences Across Social Distancing measures and COVID-19 infections by Religious Belief.

Religious Beliefs	Proper Quarantine	Usefulness Quarantine	Frequency of Controls	Contracted COVID-19	Other's Compliance
Atheist	7.10	2.70	5.57	1.35	56.94
Agnostic	6.53	2.83	5.27	1.13	60.17
Catholic	7.97	2.81	6.69	1.31	67.27
Protestant	7.26	2.65	5.89	1.17	62.25
Muslim	7.96	2.60	7.50	1.66	71.46
Jew	7.36	2.82	5.74	1.43	58.89
Other Christians	6.79	2.64	5.69	1.17	57.54
Other religion	7.17	2.66	6.25	1.24	59.62
Total	7.40	2.73	6.14	1.26	63.17

At the same time, Agnostics have the lowest. The perception of the utility of the quarantine is consistent across groups, with minor variations. Muslims show the highest appreciation for the control measures. Differences in the rate of COVID-19 contraction are negligible.

When subjects were asked what proportion of the population in their country, they believe is complying with the quarantine rules suggested by local authorities (Q27), the average was 63.17%, with the lowest value for atheists (56.94%), who tend, in line with previous results, to trust less. The opposite is true for Muslims, with 71.46% of respondents stating to comply with the new rules. All the results described so far are summarized in Table 3 (see Appendix B for further details).

Now, we consider the willingness to yell or scold someone for not respecting the rules, and notable patterns emerge (Table 4). The question was: "Have you ever yelled at or scolded someone who, in your opinion, was not respecting the rules of social isolation?" (Q25).

Muslims and Catholics show higher rates of intervention. In comparison, Atheists and Agnostics exhibit lower rates. Jews tend to intervene occasionally or not at all. It is interesting to note the pattern of the "I notified the competent authorities" behavior, with Muslims and Jews reporting that they never did so, while Catholics did it on 7.63% of the occasions. Muslims are the ones who have stepped in the most (only 16.98% say they have witnessed someone breach the law but chose not to intervene, and 11.32% say they have never reprimanded or yelled at someone). We observe a significant difference in altruistic punishment (i.e., "Yelling to") between Catholics compared to agnostics ($p < 0.05$) and Muslims compared to atheists and agnostics ($p < 0.001$), even considering a Dunn test adjusted for Bonferroni. Other religious faiths show no significant differences with atheist and agnostic groups. If we consider the variable as a dummy with value 1 if the subject has ever yelled at someone and value 0 if she has never yelled at someone or notified the authorities (dropping the dimension "no because I have never seen anyone"), then a clear difference arises between all those who declare to believe and the non-believers and agnostics (dummy variable

of subjects' reported some extent of religious beliefs) is statistically significant (Dunn Test, $p < 0.01$).

Table 4. Instances of Yelled at or Scolded Someone by Religious Beliefs.

Religious Beliefs	Once	Few times	Often	I did not intervene	I notified the competent authorities	No
Atheist	6.82	17.05	3.41	25.00	4.55	43.18
Agnostic	7.32	11.38	3.25	20.33	3.25	54.47
Catholic	12.21	18.83	7.12	14.76	7.63	39.44
Protestant	7.24	16.12	4.93	20.07	1.97	49.67
Muslim	20.75	32.08	18.87	11.32	0.00	16.98
Jew	0.00	25.93	3.70	18.52	0.00	51.85
Other Christians	6.45	15.05	2.15	19.35	0.00	56.99
Other religion	1.72	20.69	5.17	22.41	1.72	48.28
Total	9.04	17.73	5.79	18.26	3.95	45.22

On the other hand, the question on the right to punish dimension was: "Do you think it is right to penalize, even severely, those who do not respect the rules of social isolation?" (Q24).

As shown in Table 5, Muslims display the lowest percentage in the "No" category (9.43), followed by Catholics (19.39). Using a Dunn test adjusted for Bonferroni, we observe that the differences are statistically significant for Catholics compared to agnostics ($p < 0.05$) and for Muslims compared to agnostics ($p < 0.001$). Other religious faiths show no statistically significant differences with atheist and agnostic groups.

Table 5. Opinions in percentage on the Right to Penalize by Religious Beliefs.

Religious Beliefs	No	Others lives	Own lives	My life
Atheist	26.74	52.33	9.30	11.63
Agnostic	32.28	50.39	9.45	7.87
Catholic	19.39	53.57	16.58	10.46
Protestant	31.46	50.99	8.61	8.94
Muslim	9.43	60.38	22.64	7.55
Jew	28.57	57.14	3.57	10.71
Other Christians	28.87	52.58	11.34	7.22
Other religion	27.27	45.45	18.18	9.09
Average	25.53	52.37	12.72	9.39

As for the reasons for intervention, Muslims are the ones who most consider it right to punish those who do not respect the rules because they endanger the lives of others (60.39 versus the average of 52.37) or their own (22.64 versus the average of 12.72). While the fact that those who do not obey the rules endanger the lives of the respondents is a more important factor for atheists (11.63 against the average of 0.09), Jews (10.71) and Catholics (10.46).

If we consider a dummy variable (1 if the subject thinks it is right to punish and 0 if she thinks it is not right to punish), then the difference between those who believe and those who do not believe appears to be statistically significant ($p < 0.05$).

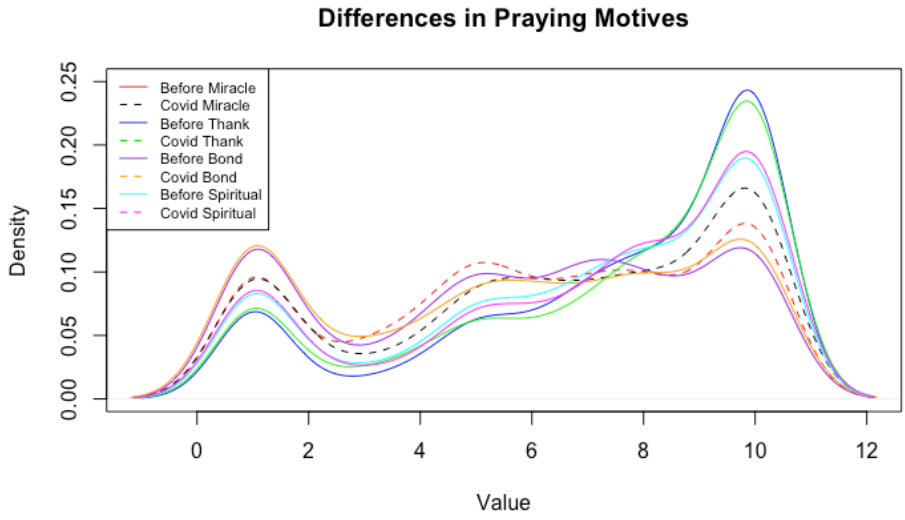
4.3 Praying motives

Looking at Table , we notice how the reasons why respondents pray did not change much from before to during COVID-19. On average, giving thanks to God (Q35-36) remains the main reason, followed by spiritual reasons, asking for grace or miracles (Q35-36), and finally, creating a bond with others (Q35-36). The distribution during COVID-19 remains unchanged, confirmed by the density plot in Figure 1.

Table 6. Self-reported praying motives before and during COVID-19 by Religions.

	Before COVID-19				**During COVID-19**			
	Miracle	Thank	Bond	Spiritual	Miracle	Than	Bond	Spiritual
Atheist	.	.	.	.	.	.	.	.
Agnostic	3.46	3.93	3.31	3.63	3.46	3.86	3.16	3.52
Catholic	6.61	7.75	6.45	7.15	7.03	7.61	6.50	7.32
Protestant	6.36	7.97	5.72	7.44	6.75	7.90	5.88	7.43
Muslim	7.34	8.34	8.02	7.70	7.66	8.11	7.02	7.66
Jew	3.59	5.31	3.46	4.56	4.23	5.23	3.96	4.75
Other Chr.	6.43	8.10	5.86	7.26	6.85	8.18	5.74	7.55
Other Rel.	5.23	6.56	5.44	6.37	5.09	6.07	5.18	5.73
Average	6.08	7.35	5.79	6.80	6.40	7.23	5.78	6.85

Figure 1. Density Plot



We can interpret praying to receive grace or miracles as an indication of a punitive conception of religion. Praying to thank God may also reveal that gratitude affects perceptions of justice and punishment. While trying to create a bond with others, it might indicate how socially bonded participants feel and whether this affects their propensity to punish others for maintaining social norms. Finally, praying for spirituality is related to a more introspective approach (Laurin et al., 2012; McKay et al., 2011).

Our analysis indicates that praying to receive grace or miracles and to thank God are two dimensions of particular significance. As we said we interpret praying for grace or miracles as suggesting a desire for divine assistance and intervention, which may be related to a tendency to delegate the enforcement of the rules to the supernatural being. This may be reflected, in turn, in a reduced inclination to decentralized altruistic punishment. On the other hand, praying to thank God may be interpreted as a sign of a positive and benevolent attitude toward others. In this case may be less inclined to punish because the focus is on generosity and the blessings received.

Our data show that praying to ask for miracles and praying to thank God are significantly related to thinking it is right to punish free riders and having scolded some rule-breakers (

Table).

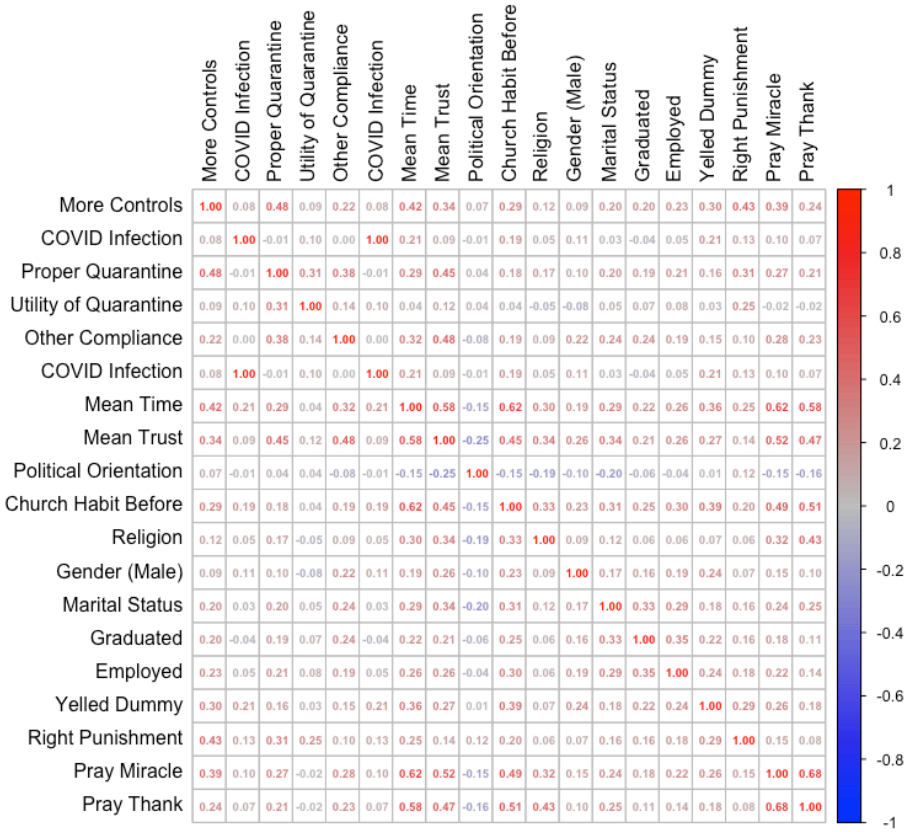
Table 7. Test results for praying motives.

	Yelled to	Right to Punish
Pray for miracle	Pr(T < t) = 0.0000	Pr(T < t) = 0.0000
Pray to thank	Pr(T < t) = 0.0000	Pr(T < t) = 0.0024

4.4 Econometric Analysis

Considering the degrees of correlation among all variables (Figure), we decided to focus the analysis only on those that are above (below) 0.40 (-0.40) and do not consider other trivial correlations (i.e., time spent in religious activities and prayer activities). Individuals who support stricter controls tend to favor punishing rule-breakers (0.43), and those who view quarantine as appropriate exhibit higher levels of institutional trust (0.45).

Figure 2. Correlogram.



Regular church attendance before the pandemic correlates with greater institutional trust (0.45), as well as praying for miracles (0.52) and thanking God (0.47). Yelling at someone for rule-breaking is associated with pre-pandemic church attendance (0.39), and trust is positively related to the belief that others comply with rules (0.48).

We test the following general form:

$$\Phi^{-1}\big(Pr(Y = 1 \mid X)\big) = \beta_0 + \beta_1 Church\ Frequency + \beta_2 Frequency\ of\ Controls + \beta_3 Right\ To\ Punish + \beta_4 Get\ Covid + \beta_5 Proper\ Quarantine + \beta_6 Utility\ Quarantine + \beta_7 Other's\ Compliance + \beta_8 Mean\ Trust + \beta_9 Political\ Orientation + \beta_{10} Male + \beta_{11} Graduate + \beta_{12} Employed + \beta_{13} Miracle + \beta_{14} Thank$$

Instead of using self-reported religious belief as the main independent variable, we focus on Church or Worship space attendance before the COVID-19 pandemic. They are, in fact, costly displays that, we think, may signal more reliably an individual's religious commitment.

Considering that these variables tend to be correlated, as highlighted above, the analysis of uncentered variance inflation factors (VIF) shows excellent results (see Table A.14) in the appendix), ruling out the possibility that the analysis is flawed by multicollinearity.

Looking at the marginal effects (Table 10), we see that spending more time on religious activities increases the likelihood of scolding someone by 33 percent, considering all control variables. These results are confirmed by the multinomial Logit model analysis and conditional marginal effects analysis on the "I did not intervene" choice (Table A.18 and A.19 in the appendix). In this case, the variable "Yelled to" is not binary but is left in the original categorical form reported above. We note that Muslims tend to intervene more (a few times or often) than others. At the same time, all religious beliefs have negative coefficient signs compared to atheists in the "I notified the competent authorities" dimension, in line with the literature showing that belief in strong, intervening Gods decreases altruistic punishment and support for state-sponsored punishment (Laurin et al., 2012).

To interpret these results in terms of the differences by religious beliefs, we analyze the results of the logit multinomial regression and, in particular, the marginal effects analysis (see appendix Tables A.18 and A.19) for an easier interpretation. We note that all the main religions (Catholic, Protestant, Muslim, Jew) have a negative coefficient for the category 'I have not intervened' compared to atheists. This suggests that religious people tend to intervene more to punish transgressors. However, the effect is statistically significant only for Catholics and Muslims. On the other hand, only agnostics have a positive and statistically significant coefficient, meaning they are less willing to intervene. When moderated by other variables, this effect becomes less pronounced, confirming the validity of the choice of time dedicated to religion as a proxy for the main analysis.

Table presents the regression estimates of the "Big Gods hypothesis" considering the dependent variable "Yelled to" as a measure of altruistic punishment, while Table 10 presents the regression estimates when considering the dependent variable "Right to Punish" as a measure of agreement to altruistic punishment. All models have robust standard errors for heteroskedasticity. The estimates from the econometric exercise led to the following results referred to participants' behavior (Results 1 and 3) and beliefs (Results 2 and 4):

Result 1. People who spend more time on religious activities tend to punish more.

We know from the non-parametric analysis that Muslims and Christians are those who punish more. From the inspection of the models reported in Table 9, however, it seems that the likelihood of having yelled is more fundamentally related to the intensity of individuals' religious commitment. In fact, the willingness to punish appears to be strongly correlated to the amount of time spent in religious activities. Since Muslims and Christians are those who, on average, spend more time in religious activities, that may help explain the result of the non-parametric test. Also, being in favor of a higher number of controls by public authorities is positively correlated with altruistic punishment. Those who have contracted the COVID-19 infection tend to be more willing to punish transgressors, especially males and those who trust the institutions more. Finally, having a degree and being employed has a positive effect on the decision to engage in altruistic punishment by yelling at someone for breaking the quarantine rules and, marginally on political liberalism.

Considering that these variables tend to be correlated, as highlighted above, the analysis of uncentered variance inflation factors (VIF) shows excellent results (see Table A.14) in the appendix), ruling out the possibility that the analysis is flawed by multicollinearity.

Looking at the marginal effects (Table 10), we see that spending more time on religious activities increases the likelihood of scolding someone by 33 percent, considering all control variables. These results are confirmed by the multinomial Logit model analysis and conditional marginal effects analysis on the "I did not intervene" choice (Table A.18 and A.19 in the appendix). In this case, the variable "Yelled to" is not binary but is left in the original categorical form reported above. We note that Muslims tend to intervene more (a few times or often) than others. At the same time, all religious beliefs have negative coefficient signs compared to atheists in the "I notified the competent authorities" dimension, in line with the literature showing that belief in strong, intervening Gods decreases altruistic punishment and support for state-sponsored punishment (Laurin et al., 2012).

To interpret these results in terms of the differences by religious beliefs, we analyze the results of the logit multinomial regression and, in particular, the marginal effects analysis (see appendix Tables A.18 and A.19) for an easier interpretation. We note that all the main religions (Catholic, Protestant, Muslim, Jew) have a negative coefficient for the category 'I have not intervened' compared to atheists. This suggests that religious people tend to intervene more to punish transgressors. However, the effect is statistically significant only for Catholics and Muslims. On the other hand, only agnostics have a positive and statistically significant coefficient, meaning they are less willing to intervene. When moderated by other variables, this effect becomes less pronounced, confirming the validity of the choice of time dedicated to religion as a proxy for the main analysis.

Table 8. Probit Regression for "Yelled to".

	(1) Yelled To	(2) Yelled To	(3) Yelled To	(4) Yelled To	(5) Yelled To
Time for Religion	.118***	.138***	.123***	.16***	.11***
	(.018)	(.019)	(.017)	(.021)	(.025)
Frequency of Controls	.1***				.095***
	(.021)				(.024)
COVID Infection	.252***				.258***
	(.069)				(.076)
Proper Quarantine	.014				-.013
	(.025)				(.029)
Utility of Quarantine	-.004				0
	(.063)				(.068)
Other Compliance	0				-.004
	(.003)				(.003)
Institutional Trust		.102***			.048
		(.027)			(.036)
Interpersonal Trust		.003			.034
		(.11)			(.116)
Political Orientation		.135*			.122*
		(.056)			(.061)
Gender (Male)			.407***		.459***
			(.096)		(.109)
Married			.002		.041
			(.105)		(.118)
Graduate			.301**		.29*
			(.104)		(.117)
Employed			.295**		.25*
			(.107)		(.119)
Pray for Miracle				.033	-.002
				(.022)	(.026)
Pray to Thank				-.036	-.017

				(.024)	(.027)
Constant	-2.101***	-1.803***	-1.641***	-1.2***	-2.404***
	(.255)	(.174)	(.134)	(.136)	(.291)
Observations	817	803	849	821	764
Pseudo R^2	.137	.121	.136	.096	.199

Notes: The estimates were obtained using a probit model, with the dependent variable being 'Yelled to'. Standard errors are reported in parentheses. Statistical significance levels are indicated as follows: *** p<.001, ** p<.01, * p<.05. For all five models, which differ based on the covariates included, robust standard errors were computed to account for potential heterogeneity in the data.

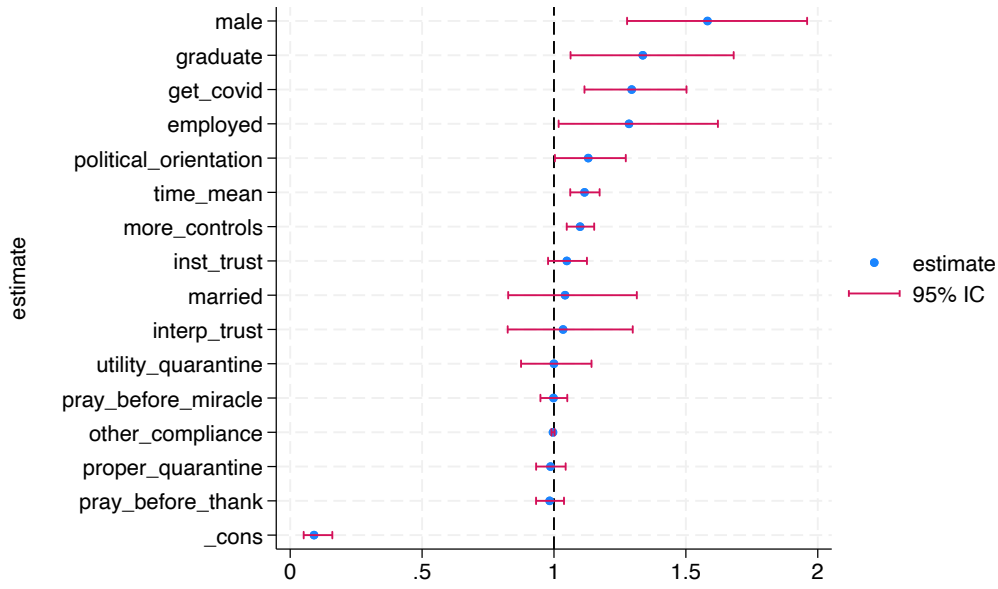
Table 9. Regression Models comparison and robustness check with OLS specifications. Probit and Logit as marginal effects.

	(1 Probit) Yelled To	(2 Logit) Yelled To	(3 OLS) Yelled To
Time for Religion	.11***	.184***	.033***
	(.025)	(.042)	(.007)
Frequency of Controls	.094***	.159***	.028***
	(.024)	(.042)	(.007)
COVID Infection	.26***	.451***	.089***
	(.076)	(.133)	(.025)
Proper Quarantine	-.012	-.034	-.006
	(.029)	(.052)	(.009)
Utility of Quarantine	-.002	-.014	-.003
	(.068)	(.115)	(.021)
Other Compliance	-.003	-.005	-.001
	(.003)	(.005)	(.001)
Mean Trust	.032	.065	.014
	(.037)	(.064)	(.011)
Political Orientation	.121*	.2*	.035
	(.06)	(.102)	(.019)
Gender (Male)	.455***	.76***	.145***
	(.108)	(.185)	(.034)

Married	.039	.067	.016
	(.119)	(.205)	(.035)
Graduate	.304**	.525**	.093**
	(.117)	(.201)	(.034)
Employed	.263*	.462*	.084*
	(.119)	(.206)	(.035)
Pray for Miracle	.005	.01	.005
	(.026)	(.044)	(.008)
Pray to Thank	-.019	-.035	-.008
	(.027)	(.049)	(.008)
Constant	-2.399***	-4.016***	-.272***
Observations	767	767	767

Notes: The table presents results from three different model specifications: (1) Probit, (2) Logit, and (3) OLS regressions, with the dependent variable being 'Yelled to'. Standard errors are reported in parentheses. Statistical significance levels are indicated as follows: *** p<.001, ** p<.01, * p<.05. In each model, robust standard errors were used to account for potential heteroscedasticity and specification issues. The models include various covariates such as religious practices, frequency of controls, institutional and interpersonal trust, political orientation, and sociodemographic characteristics. The number of observations for each model is noted in the final row

Figure 3. Odds ratios. Dependent Variable: Yelled to (binary).



We test a second hypothesis that links the altruistic punishment to the reason why people spend time praying. Since praying to ask for a miracle can be seen as a sign of a belief in a punitive God, we relate this motive to pray to the tendency to punish. However, we do not find such a correlation in our data.

Result 2. We cannot confirm that subjects who report praying to ask for a miracle are less likely to punish.

As for result 3, using the belief that it is right to punish those who do not follow the rules as a dependent variable, the proxies used to identify religious belief (time spent on religion) are found to be significant with a positive coefficient. On average, across the sample, each additional unit of time dedicated to religious activities increases the probability of believing it is right to punish the transgressors by about 8 percentage points. Following the results of the probit analysis reported in

Table , we see that "frequency of controls", "utility of quarantine", and "political orientation" have all a positive and significant effect on the dependent variable.

Result 3. Those who spend more time in religious activities consider it right to punish a free rider more than those who do not believe.

Table 10. Probit Regression for "Right to Punish".

	(1) Right to Punish	(2) Right to Punish	(3) Right to Punish	(4) Right to Punish	(5) Right to Punish
Time for Religion	.035	.092***	.079***	.11***	.092**
	(.021)	(.022)	(.018)	(.023)	(.031)
Frequency of Controls	.185***				.19***
	(.025)				(.027)
COVID Infection	.242*				.236*
	(.099)				(.114)
Proper Quarantine	.064*				.047
	(.027)				(.029)
Utility of Quarantine	.406***				.46***
	(.078)				(.086)
Other Compliance	-.002				-.004
	(.003)				(.003)
Institutional Trust		.101***			-.02
		(.028)			(.04)
Interpersonal Trust		-.168			-.143
		(.118)			(.134)

Political Orientation		.318***			.25**
		(.065)			(.076)
Gender (Male)			.042		.168
			(.103)		(.129)
Married			.209		.31*
			(.109)		(.13)
Graduate			.267*		.078
			(.111)		(.134)
Employed			.242*		.063
			(.112)		(.134)
Pray for Miracle				.031	-.012
				(.023)	(.027)
Pray to Thank				-.037	-.041
				(.023)	(.027)
Constant	-2.198***	-.287	-.067	.262*	-2.209***
	(.29)	(.158)	(.108)	(.127)	(.321)
Observations	817	803	849	821	764
R^2/Pseudo R^2	.232	.09	.073	.05	.278

Notes: The estimates were obtained using a probit model, with the dependent variable being 'Right to Punish'. Standard errors are reported in parentheses. Statistical significance levels are indicated as follows: *** p<.001, ** p<.01, * p<.05. For all five models, which differ based on the covariates included, robust standard errors were computed to account for potential heterogeneity in the data.

Figure 4. Odds ratios. Dependent Variable: Right to Punish (binary).

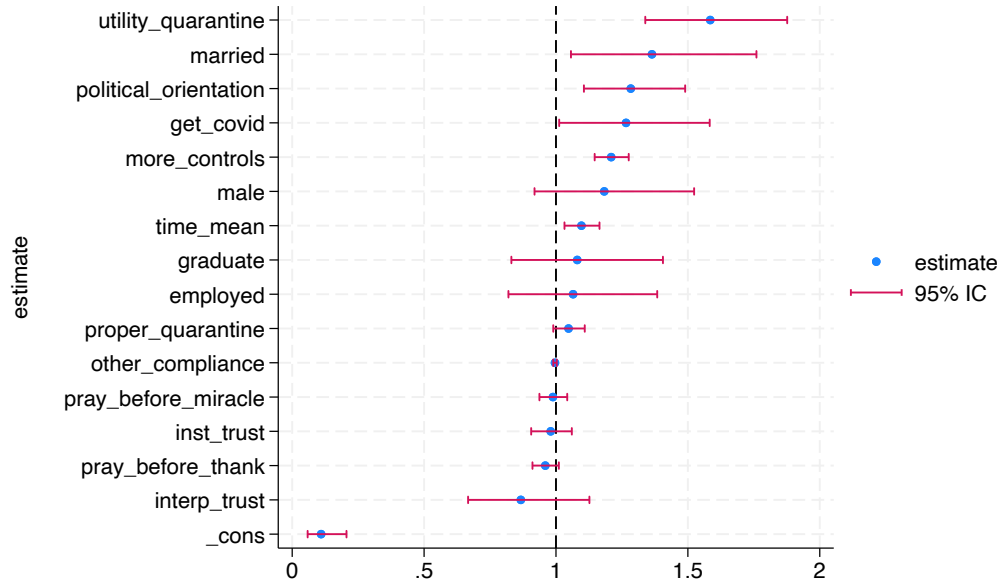


Table 11. Regression Models comparison and robustness check with OLS specifications. Probit and Logit as marginal effects.

	(1 Probit) Right To Punish	(2 Logit) Right To Punish	(3 OLS) Right To Punish
Time for Religion	.092**	.147**	.019*
	(.031)	(.055)	(.007)
Frequency of Controls	.19***	.32***	.048***
	(.027)	(.051)	(.007)
COVID Infection	.236*	.397	.035*
	(.114)	(.227)	(.017)
Proper Quarantine	.047	.086	.017*
	(.029)	(.054)	(.008)
Utility of Quarantine	.46***	.789***	.099***
	(.086)	(.157)	(.019)
Other Compliance	-.004	-.005	-.001
	(.003)	(.006)	(.001)
Institutional Trust	-.02	-.101	-.018*
	(.04)	(.072)	(.009)
Interpersonal Trust	-.143		
	(.134)		
Political Orientation	.25**	.427**	.048**
	(.076)	(.136)	(.015)
Gender (Male)	.168	.28	.028
	(.129)	(.23)	(.029)
Married	.31*	.548*	.066*
	(.13)	(.231)	(.032)
Graduate	.078	.185	.032
	(.134)	(.241)	(.033)
Employed	.063	.152	.027
	(.134)	(.237)	(.033)
Pray for Miracle	-.012	.014	-.003
	(.027)	(.048)	(.007)
Pray to Thank	-.041	-.065	-.006
	(.027)	(.047)	(.007)
Constant	-2.209***	-3.8***	.067
	(.321)	(.56)	(.069)
Observations	764	767	767

Notes: The table presents results from three different model specifications: (1) Probit, (2) Logit, and (3) OLS regressions, with the dependent variable being 'Right to Punish'. Standard errors are

reported in parentheses. Statistical significance levels are indicated as follows: *** p<.001, ** p<.01, * p<.05. In each model, robust standard errors were used to account for potential heteroscedasticity and specification issues. The models include various covariates such as religious practices, frequency of controls, institutional and interpersonal trust, political orientation, and sociodemographic characteristics. The number of observations for each model is noted in the final row.

The results are robust even when different proxies are used for time devoted to religion, such as church attendance before COVID and SEM specification (Table A.21 in the appendix).

Finally, we find any significant correlation between praying to ask for a miracle and believing that it is right to punish.

> *Result 4*. We cannot confirm that subjects who report praying to ask for a miracle are less likely to think it is right to punish the transgressors of the containment rules.

5 Discussion.

The paper explores the relationship between religious beliefs, behaviors, and attitudes toward decentralized rule enforcement during the COVID-19 pandemic. The subsequent discussion will address the key findings of the results and their implications.

Firstly, as for the relation between religious activity and punishment behavior, we find that the time spent on religious activities correlates strongly with the likelihood of engaging in altruistic punishment (e.g., yelling at rule-breakers). Time for religion is consistently positive and significant across models. A 33% increase in the likelihood of scolding others is associated with greater religious participation. Religious activities seem to foster social norms that emphasize accountability and communal order, aligning with theories linking religiosity to social regulation. Secondly, we find that institutional trust positively affects both altruistic punishment and attitudes toward the appropriateness of punishment. The correlation between trust and yelling is significant but sensitive to model specification. Trust and belief in punishment are negatively correlated in some cases, suggesting nuanced dynamics in how trust moderates social behavior. It seems that high levels of trust might encourage the enforcement of rules, yet the interplay with specific trust types (e.g., institutional vs. interpersonal) deserves further exploration. Two further results refer to the COVID-19 experience and gender effects. People who contracted COVID-19 are, in fact, more likely to engage in altruistic punishment. Personal experience with COVID-19 might increase perceived vulnerability and awareness of non-compliance costs, motivating stricter rule enforcement. We also find a higher likelihood for males to punish, which aligns with much other research linking masculinity to enforcement behaviors. Having a political liberal orientation and being a graduate positively predict punishment behaviors. Educational attainment may foster a sense of civic duty, while political ideology could reflect underlying values about collective vs individual responsibility. Finally, following the multinomial analysis (Appendix A, Table A.18) Muslims and Catholics are more likely to intervene, whereas agnostics are less likely to act. It is also noteworthy that time spent in religious activities predicts punishment behaviors more consistently than self-reported

religious beliefs. In this case, behavioral proxies (e.g., attendance and activity) seem to be more reliable predictors than abstract belief systems, supporting the literature that religiosity as a lived experience impacts social actions. Our results align with theories emphasizing the social regulatory role of religiosity but nuances the findings by differentiating between belief and practice.

These findings also have potentially interesting policy implications. A better understanding of the role of religious behavior in fostering compliance and enforcement can inform community-based interventions during crises. In this way, strategies leveraging existing communal and religious structures may be properly designed to enhance public health adherence. This analysis also provides important additional knowledge for understanding how religiosity, trust, and socio-demographic factors interplay in shaping attitudes toward rule enforcement and compliance, particularly under crisis conditions.

While our findings provide novel insights into the relationship between religiosity and altruistic punishment during the COVID-19 pandemic, several limitations should be noted. First, there is the possibility of reverse causation. It is plausible, in fact, that punitive tendencies might drive religiosity. While individuals with punitive tendencies may gravitate toward religious practices, our analysis mitigates this concern through several strategies. First, we include pre-pandemic religiosity (e.g., church attendance before COVID-19) as a proxy for stable, long-term religiosity, reducing the likelihood of short-term behavioral shifts. Furthermore, propensity score matching and sensitivity analyses confirm that religiosity predicts punitive behaviors even after accounting for confounders like political orientation and trust in authority. Lastly, the observed relationship aligns with theoretical expectations that religiosity fosters norm enforcement as a mechanism to sustain social order, further reducing the plausibility of reverse causation.

A second source of concern is the reliance on self-reported data, which may introduce potential biases due to social desirability and recall inaccuracies, which may affect the validity of responses related to religious practices and attitudes toward rule enforcement.

Third, the cross-sectional nature of the data limits our ability to infer causality, leaving open questions about whether religiosity drives punitive behavior or if other factors mediate this relationship.

Fourth, the study's global pandemic context may have amplified specific dynamics, such as heightened stress and rule enforcement debates, that are not necessarily generalizable to non-crisis periods. Additionally, while time spent on religious activities is a proxy for religiosity, it does not capture the multidimensional nature of religious experience, including doctrinal beliefs and intrinsic versus extrinsic motivations. Finally, the scope of punitive behaviors is limited to scolding or yelling, excluding other forms of enforcement that could offer a more nuanced understanding of the relationship between religiosity and norm compliance. Future research addressing these limitations through longitudinal designs, cross-cultural comparisons, and expanded measures of religiosity and punishment behaviors would provide a deeper understanding of these complex dynamics.

Future research should build on these findings by addressing several key areas. First, longitudinal studies could explore the causal pathways between religiosity and punitive behaviors, clarifying whether religious engagement drives norm enforcement or reflects broader cultural and psychological factors. Second, cross-cultural investigations would provide valuable insights into how the relationship between religion and rule compliance varies across different societal and institutional contexts, particularly in secular versus highly religious settings. Additionally, future studies should incorporate multidimensional measures of religiosity, including doctrinal adherence, moral values, and community participation, to capture the full spectrum of religious engagement.

6 Conclusions

The results of our study indicate that the degree of engagement in religious activities positively affects the enforcement of norms through decentralized altruistic punishment. If these norms encourage the maintenance of cooperative behaviors within the group, then religions that employ these concepts will enhance the probability of their vectors' survival, which will, in turn, facilitate the survival of the religion itself.

Overall, the results indicate that religious involvement, measured through time spent on religious activities, generally increases the likelihood of yelling at someone that do not respect the rules. This result aligns with the hypothesis that participation in religions centered on Big Gods leads to more prosocial behavior in anonymous settings, incentivizing monitoring and penalizing deviation from others' selfishness even if punishing costs (Henrich et al., 2006; Laurin et al., 2012; McKay et al., 2011; Norenzayan et al., 2014). This result remains confirmed even when controlling for other variables representing potential back doors. Moreover, dedicating time to religious activities is associated with a higher likelihood of believing it is right to punish non-compliance.

The novelty of our study lies in that, compared to other studies, the results were obtained without having to do any real priming of belief in God. On the other hand, this is also a limitation as it probably accounts for the absence of reduced punishment by those who believe in a punitive God. As this study relies on cross-sectional survey data, it is inherently limited in establishing causal relationships between religiosity and punitive behaviors. Causality is particularly challenging to ascertain in the case of religiosity, a deeply ingrained and multifaceted characteristic influenced by personal beliefs, cultural norms, and social environments. Unlike variables that can be externally manipulated or observed in isolation, religiosity is often endogenous to broader life experiences and societal structures.

Declarations

Competing interests. The authors declare no competing interests. This research did not receive any specific grant from funding agencies in the public, commercial, or non-profit sectors.

Data availability. The survey protocol was approved after the Cardiff University IRB (Ethics and APA) and pre-registered at Economic Observatory[2]. Data are currently available on request.

[2] Well-being, religious beliefs and virtual relations at the time of Covid-19 lockdown.

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Appendix A. Sample Specifics and Additional Test Results

Table A.1. Institutional Trust by religious beliefs

Religious Beliefs	President	Congress	Federal Gov't	Regional Gov't	Local Gov't	Political Gov't	Law Enforcement	Healthcare	Military	Church	People
Atheist	4.13	4.97	4.63	5.38	5.51	4.17	5.91	5.91	6.19	3.17	0.24
Agnostic	3.05	4.20	4.05	4.82	5.21	3.48	5.15	5.25	5.59	3.44	0.27
Catholic	6.35	6.49	6.46	6.81	6.96	5.85	7.12	7.44	7.68	7.58	0.24
Protestant	6.15	5.52	5.60	6.22	6.49	4.91	7.04	6.83	7.75	7.80	0.23
Muslim	6.87	7.17	7.09	6.80	6.81	6.38	7.08	7.87	7.34	6.92	0.38
Jew	4.07	4.96	4.36	5.82	6.11	4.25	6.46	6.21	6.50	5.33	0.26
Other Christians	5.27	5.09	4.68	5.26	5.56	4.24	6.04	6.21	6.87	7.46	0.25
Other religion	4.40	4.62	4.81	5.34	6.06	4.46	5.94	6.43	6.52	4.67	0.19
Average	5.56	5.65	5.58	6.11	6.35	4.99	6.63	6.76	7.20	6.64	0.24

The following tests report the results of the variance analysis and comparison of means (adjusted for Bonferroni) with ANOVA. Where the equivalence of variances was violated, the results of the non-parametric Kruskal-Wallis equality-of-populations rank test are also reported.

Trust

Table A.2. Analysis of Variance of Trust by Religious Beliefs. Bartlett's equal-variances test: chi2(7) = 8.6474; Prob>chi2 = 0.279.

Source	SS	df	MS	F	Prob > F
Between groups	906.54781	7	129.50683	31.85	0.0000
Within groups	4618.80441	1136	4.06584895		
Total	5525.35221	1143	4.83407893		

Table A.3. Comparison of Average Trust by Religious Beliefs (Bonferroni)

	Atheist	**Agnostic**	**Catholic**	**Protestant**	**Muslim**	**Jew**
Agnostic	-.551249					
	1.000					
Catholic	2.00876	2.56				
	0.000	0.000				
Protestant	1.59266	2.14391	-.416096			
	0.000	0.000	0.170			
Muslims	2.0566	2.60785	.047844	.46394		
	0.000	0.000	1.000	1.000		
Jews	.571556	1.12281	-1.4372	-1.0211	-1.48504	
	1.000	0.272	0.013	0.368	0.062	
Other Chr.	.881871	1.43312	-1.12688	-.710788	-1.17473	.310315
	0.112	0.000	0.000	0.096	0.025	1.000
Other rel.	.420683	.971932	-1.58807	-1.17198	-1.63592	-.150873
	1.000	0.142	0.000	0.007	0.002	1.000

Political Orientation

Table A.4. Analysis of Variance of Political Orientation by Religious Beliefs. Bartlett's equal-variances test: chi2(7) = 26.4471; Prob>chi2 = 0.000.

Source	SS	df	MS	F	Prob > F
Between groups	41.2359633	7	5.8908519	8.28	0.0000
Within groups	812.154811	1141	.711792122		
Total	853.390775	1148	.743371755		

Table A.5. Comparison of Political Orientation by Religious Beliefs (Bonferroni)

	Atheist	**Agnostic**	**Catholic**	**Protestant**	**Muslim**	**Jew**
Agnostic	0					
	1.000					
Catholic	-0	-0				
	0.457	0.000				
Protestant	-0	-1	-0			
	0.024	0.000	1.000			
Muslims	-0	-0	0	0		
	1.000	0.578	1.000	1.000		
Jews	0	-0	0	0	0	
	1.000	1.000	0.919	0.183	1.000	
Other Chr.	-0	-0	-0	0	-0	-0
	.572	0.001	1.000	1.000	1.000	0.744
Other rel.	0	0	0	1	0	0
	1.000	1.000	0.010	0.001	0.814	1.000

Attention to Rules

Table A.6. Analysis of Variance of Attention to Rules by Religious Beliefs. Bartlett's equal-variances test: chi2(7) = 19.8224; Prob>chi2 = 0.006. Kruskal–Wallis equality-of-populations rank test Prob = 0.0001.

Source	SS	df	MS	F	Prob > F
Between groups	129.89661	7	18.5566585	5.33	0.0000
Within groups	4104.59963	1178	3.48437999		
Total	4234.49624	1185	3.57341455		

Table A.7. Comparison of Average Attention to Rules by Religious Beliefs (Bonferroni)

	Atheist	**Agnostic**	**Catholic**	**Protestant**	**Muslim**	**Jew**
Agnostic	.108715					
	1.000					
Catholic	.93119	.822475				
	0.001	0.000				
Protestant	.68792	.579205	-.24327			
	0.060	0.071	1.000			
Muslims	.570202	.461487	-.360988	-.117718		
	1.000	1.000	1.000	1.000		
Jews	.144805	.03609	-.786384	-.543114	-.425397	
	1.000	1.000	0.876	1.000	1.000	
Other Chr.	.465276	.356562	-.465913	-.222643	-.104926	.320471
	1.000	1.000	0.768	1.000	1.000	1.000
Other rel.	1.12159	1.01288	.190401	.433671	.551389	.976786
	0.023	0.037	1.000	1.000	1.000	0.783

Time for Religion

Table A.8. Analysis of Variance of Time for Religion by Religious Beliefs. Bartlett's equal-variances test: chi2(6) = 5.2132; Prob>chi2 = 0.517

Source	SS	df	MS	F	Prob > F
Between groups	998.919721	6	166.48662	21.71	0.0000
Within groups	6457.2533	842	7.66894691		
Total	7456.17302	848	8.79265686		

Table A.9. Comparison of Time for Religion by Religious Beliefs (Bonferroni)

	Agnostic	**Catholic**	**Protestant**	**Muslim**	**Jew**	**Other Ch**
Catholic	3.27239					
	0.000					
Protestant	2.49015	-.782237				
	0.000	0.018				
Muslims	4.11907	.84668	1.62892			
	0.000	0.837	0.003			
Jews	.835268	-2.43712	-1.65488	-3.2838		
	1.000	0.001	0.158	0.000		
Other Chr.	2.32059	-.951797	-.16956	-1.79848	1.48532	
	0.000	0.243	1.000	0.011	0.636	
Other rel.	2.07163	-1.20076	-.418519	-2.04744	1.23636	-.248958
	0.008	0.480	1.000	0.027	1.000	1.000

"Yelled To"

Table A.10. Analysis of Variance of Yelled to by Religious Beliefs. Bartlett's equal-variances test: chi2(6) = 9.5353; Prob>chi2 = 0.216

Source	SS	df	MS	F	Prob > F
Between groups	13.2553648	7	1.89362355	9.29	0.0000
Within groups	243.043802	1192	.203895807		
Total	256.299167	1199	.213760773		

Table A.11. Comparison of Yelled To by Religious Beliefs (Bonferroni)

	Atheist	**Agnostic**	**Catholic**	**Protestant**	**Muslim**	**Jew**
Agnostic	-.065174					
	1.000					
Catholic	.100081	.165256				
	1.000	0.007				
Protesta	-.001786	.063388	-.101867			
	1.000	1.000	0.063			
Muslim	.437037	.502211	.336956	.438823		
	0.000	0.000	0.000	0.000		
Jew	.009195	.07437	-.090886	.010981	-.427842	
	1.000	1.000	1.000	1.000	0.001	
Other Ch	-.062585	.002589	-.162667	-.060799	-.499622	-.07178
	1.000	1.000	0.039	1.000	0.000	1.000
Other re .	033333	.098507	-.066748	.035119	-.403704	.024138
	1.000	1.000	1.000	1.000	0.000	1.000

Right to Punish

Table A.12. Analysis of Variance of Right to Punish by Religious Beliefs. Bartlett's equal-variances test: chi2(6) = 24.4380; Prob>chi2 = 0.001. Kruskal–Wallis equality-of-populations rank test Prob = 0.0017.

Source	SS	df	MS	F	Prob > F
Between groups	4.23212879	7	.604589827	3.33	0.0016
Within groups	216.200371	1192	.18137615		
Total	220.4325	1199	.183846956		

Table A.13. Comparison of Right to Punish by Religious Beliefs (Bonferroni)

	Atheist	**Agnostic**	**Catholic**	**Protestant**	**Muslim**	**Jew**
Agnostic	-.050415					
	1.000					
Catholic	.069736	.120151				
	1.000	0.131				
Protestant	-.036111	.014303	-.105848			
1	.000	1.000	0.021			
Muslim	162963	.213378	.093226	.199074		
	0.739	0.054	1.000	0.041		
Jew	-.020307	.030108	-.090043	.015805	-.183269	
	1.000	1.000	1.000	1.000	1.000	
Other Ch	-.040363	.010052	-.110099	-.004252	-.203326	-.020056
	1.000	1.000	0.608	1.000	0.138	1.000
Other rel.	035556	.08597	-.034181	.071667	-.127407	.055862
	1.000	1.000	1.000	1.000	1.000	1.000

Different Regression Models Specification

Table A.14. Uncentered variance inflation factors (VIFs) for the independent variables.

Variable	**VIF**	**1/VIF**
Mean Trust	2.04	0.490819
Proper Quarantine	1.76	0.569291
Time for Religion	1.71	0.584235
Frequency of Controls	1.64	0.609607
Other Compliance	1.39	0.719505
Married	1.30	0.769504
Graduate	1.26	0.795095
Employed	1.25	0.797158
Utility of Quarantine	1.23	0.815698
Political Orientation	1.15	0.866404
Gender (male)	1.14	0.877383
COVID Infection	1.10	0.912970
Mean VIF	1.41	Mean VIF

Table A.15. Logit Regression for Yelled to

	(1) Yelled To	(2) Yelled To	(3) Yelled To	(4) Yelled To	(5) Yelled To
Time for Religion	.196***	.226***	.208***	.263***	.184***
	(.031)	(.031)	(.029)	(.036)	(.042)
Frequency of Controls	.167***				.159***
	(.036)				(.042)
COVID Infection	.426***				.451***
	(.118)				(.133)
Proper Quarantine	.019				-.034
	(.043)				(.052)
Utility of Quarantine	-.011				-.014
	(.107)				(.115)
Other Compliance	.001				-.005
	(.005)				(.005)
Mean Trust		.149**			.065
		(.046)			(.064)
Political Orientation		.21*			.2*
		(.091)			(.102)
Gender (Male)			.702***		.76***
			(.161)		(.185)
Married			.005		.067
			(.175)		(.205)
Graduate			.516**		.525**
			(.175)		(.201)
Employed			.513**		.462*
			(.181)		(.206)
Pray for Miracle				.061	.01
				(.037)	(.044)
Pray to Thank				-.064	-.035
				(.041)	(.049)
Constant	-3.502***	-2.852***	-2.802***	-1.979***	-4.016***
	(.441)	(.31)	(.246)	(.236)	(.503)
Observations	817	809	849	821	767
Pseudo R^2	.137	.11	.139	.096	.198

Standard errors are in parentheses. *** p<.001, ** p<.01, * p<.05

Table A.16. Logit Regression for Right to Punish.

	(1) Right to Punish	(2) Right to Punish	(3) Right to Punish	(4) Right to Punish	(5) Right to Punish
Time for Religion	.065	.17***	.134***	.194***	.147**
	(.038)	(.039)	(.033)	(.041)	(.055)
Frequency of Controls	.334***				.32***
	(.046)				(.051)
COVID Infection	.437*				.397
	(.199)				(.227)
Proper Quarantine	.103*				.086
	(.048)				(.054)
Utility of Quarantine	.714***				.789***
	(.142)				(.157)
Other Compliance	-.004				-.005
	(.006)				(.006)
Mean Trust		.132**			-.101
		(.049)			(.072)
Political Orientation		.567***			.427**
		(.115)			(.136)
Gender (Male)			.061		.28
			(.179)		(.23)
Married			.358		.548*
			(.189)		(.231)
Graduate			.435*		.185
			(.194)		(.241)
Employed			.373		.152
			(.197)		(.237)
Pray for Miracle				.05	.014
				(.04)	(.048)
Pray to Thank				-.064	-.065
				(.039)	(.047)
Constant	-3.896***	-.443	-.114	.399	-3.8***
	(.523)	(.27)	(.179)	(.211)	(.56)
Observations	817	809	849	821	767
Pseudo R^2	.235	.082	.07	.05	.27

Standard errors are in parentheses. *** p<.001, ** p<.01, * p<.05

Table A.17. Regression Models comparison and robustness check with OLS specifications

	(1 Probit) Yelled To	(2 Logit) Yelled To	(3 OLS) Yelled To
Time for Religion	.082**	.147**	.019*
	(.03)	(.055)	(.007)
Frequency of Controls	.18***	.32***	.048***
	(.028)	(.051)	(.007)
COVID Infection	.225*	.397	.035*
	(.109)	(.227)	(.017)
Proper Quarantine	.051	.086	.017*
	(.029)	(.054)	(.008)
Utility of Quarantine	.441***	.789***	.099***
	(.085)	(.157)	(.019)
Other Compliance	-.003	-.005	-.001
	(.003)	(.006)	(.001)
Mean Trust	-.049	-.101	-.018*
	(.04)	(.072)	(.009)
Political Orientation	.239**	.427**	.048**
	(.076)	(.136)	(.015)
Gender (Male)	.155	.28	.028
	(.128)	(.23)	(.029)
Married	.294*	.548*	.066*
	(.13)	(.231)	(.032)
Graduate	.127	.185	.032
	(.132)	(.241)	(.033)
Employed	.096	.152	.027
	(.132)	(.237)	(.033)
Pray for Miracle	.003	.014	-.003
	(.027)	(.048)	(.007)
Pray to Thank	-.039	-.065	-.006
	(.026)	(.047)	(.007)
Constant	-2.117***	-3.8***	.067
	(.313)	(.56)	(.069)
Observations	767	767	767
Pseudo R^2	.267	.270	.265

Standard errors are in parentheses. *** p<.001, ** p<.01, * p<.05

Table A.18. Multinomial logistic regression. Number of obs = 624. Pseudo R2 = 0.0391. Log pseudolikelihood = -872.92937

	(1)
	MLogit
	Yes Once
Atheist	0
Agnostic	0.278
Catholic	1.110*
Protestant	0.292
Muslim	1.905**
Jew	-13.79***
Other Christians	0.0183
Other religion	-1.098
Constant	-1.299**
	Yes, a few times
Atheist	0
Agnostic	-0.197
Catholic	0.627
Protestant	0.172
Muslim	1.424*
Jew	0.720
Other Christians	-0.0225
Other religion	0.470
Constant	-0.383
	Yes Often
Atheist	0
Agnostic	0.160
Catholic	1.264
Protestant	0.557
Muslim	2.503**
Jew	0.383

Other Christians	0.201
Other religion	0.288
Constant	-1.992**
I did not intervene (baseline)	
I notify the competent authorities	
Atheist	0
Agnostic	-0.128
Catholic	1.046
Protestant	-0.646
Muslim	-13.17***
Jew	-14.21***
Other Christians	-14.27***
Other religion	-0.693
Constant	-1.705**
N	624

Table A.19. Conditional marginal effects. VCE Robust. Pr(yelled=I did not intervene). Number of obs = 624.

	dy/dx	std. err.	z	P>z	[95% conf.	interval]
Agnostic	0.006	0.097	0.070	0.947	-0.183	0.196
Catholic	-0.196	0.076	-2.600	0.009	-0.344	-0.048
Protestant	-0.041	0.080	-0.510	0.608	-0.199	0.116
Muslim	-0.304	0.087	-3.480	0.001	-0.475	-0.133
Jew	-0.055	0.152	-0.360	0.716	-0.354	0.243
Other Christians	0.034	0.107	0.310	0.753	-0.177	0.244
Other religion	-0.033	0.118	-0.280	0.782	-0.264	0.198

Table A.20. Conditional marginal effects. VCE Robust. Pr(yelled=I did not intervene). Number of obs = 444.

	dy/dx	std. err.	z	P>z	[95% conf. interval]	
Time for Religion	-.035	0.010	-3.57	0.000	-0.054	-0.016
Frequency of Controls	-.019	0.009	-2.05	0.041	-0.038	-0.001
COVID Infection	.012	0.025	0.47	0.640	-0.037	0.061
Proper Quarantine	-.002	0.011	-0.20	0.845	-0.023	0.019
Utility of Quarantine	.017	0.025	0.68	0.498	-0.032	0.066
Other Compliance	-.000	0.001	-0.05	0.960	-0.002	0.002
Mean Trust	-.010	0.014	-0.68	0.494	-0.038	0.018
Political Orientation	.003	0.023	0.13	0.898	-0.042	0.048
Gender (Male)	-.047	0.041	-1.15	0.251	-0.128	0.034
Married	-.017	0.045	-0.36	0.715	-0.105	0.072
Graduate	-.092	0.048	-1.93	0.054	-0.185	0.002
Employed	.016	0.048	0.34	0.732	-0.077	0.110
Pray for Miracle	.0013	.0100	0.13	0.893	-.0183	.0210
Pray for Thanks	-.0056	.009	-0.57	0.568	-.0252	.0138

Table A.21. SEM Results

	Coefficient	**std. err.**	**z**	**P>z**	**[95% conf. interval]**	
Yelled to						
Mean Trust	0.011	0.00870	1.22	0.222	-0.00643	0.0277
Frequency of Controls	0.0318	0.00586	5.44	0.000	0.0204	0.0433
Pray for a Miracle	0.00184	0.00625	0.29	0.769	-0.0104	0.0141
COVID Infection	0.095	0.0241	3.92	0.000	0.0472	0.142
Time for Religion	0.0348	0.00688	5.07	0.000	0.0214	0.0483
Mean Trust						
Time for Religion	0.417	0.0228	18.3	0.000	0.372	0.462
Frequency of Controls						
Mean Trust	0.433	0.0461	9.39	0.000	0.342	0.523
Pray for a Miracle						
Time for Religion	0.651	0.0299	21.8	0.000	0.592	0.710

Figure A.1. Alternative Correlogram

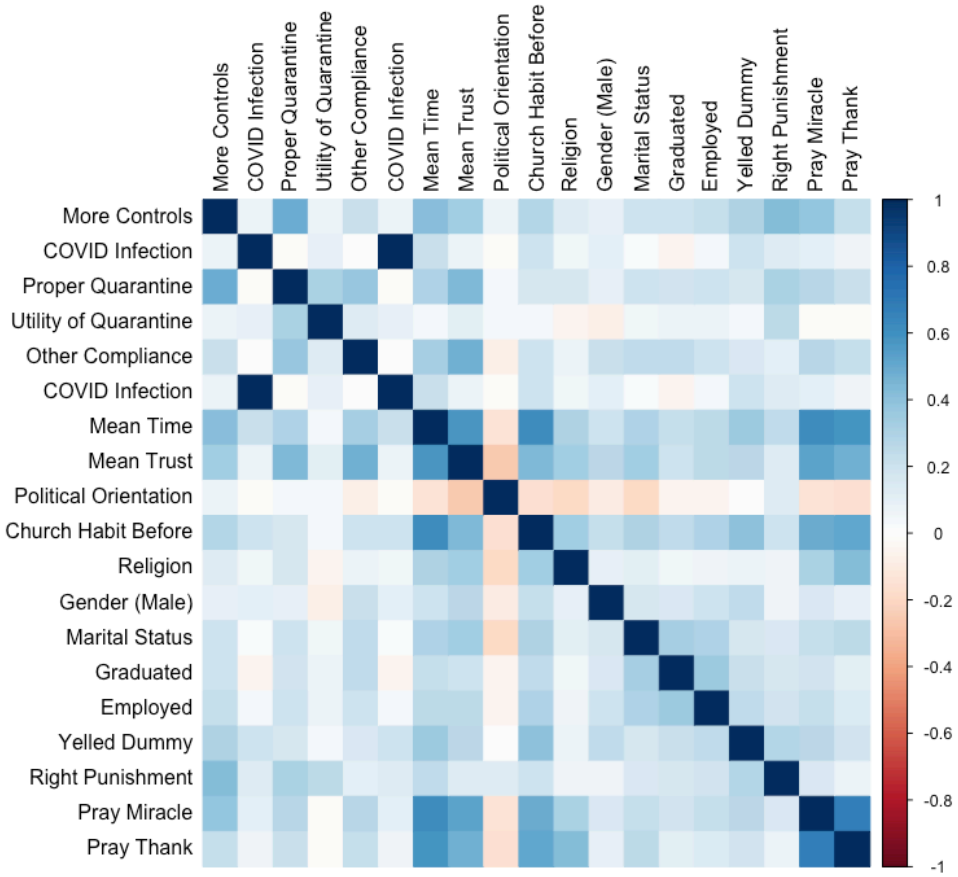
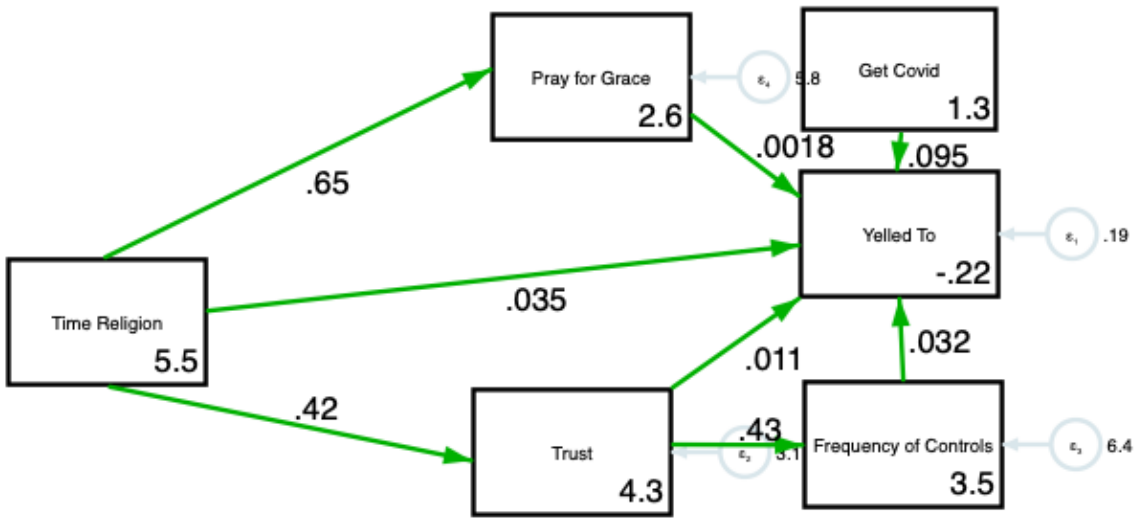


Figure A.2. Structural Equation Model graph and results (Means)



Appendix C. Questionnaire

1. ::: ELECTRONIC CONSENT :::

Clicking on the "agree" button below indicates that:

* I have read ready the above information
* I have voluntarily agreed to participate
* I am > 18 years old

* In compliance with EU General Data Protection Regulation (GDPR), I hereby authorize the recipient of this document to use and process my personal details for research purposes. In addition to my general personal information, I also in particular authorize the processing of my so-called sensitive data and its anonymous dissemination, within the limits indicated above

If you do not wish to participate in the research study, please decline the participation by closing the browser.

○ Agree: Proceed to the questionnaire

* 2. You are:

- ◯ Male
- ◯ Female
- ◯ Prefer not to say

* 3. How old are you?

- ◯ Prefer not to say
- ◯ My age is:

* 4. In which country do you live?

Prefer not to say

* 5. What is your country of origin?

Prefer not to say

* 6. What is your marital status?

- ◯ unmarried/maiden
- ◯ married
- ◯ cohabiting
- ◯ divorced
- ◯ legally separated
- ◯ widow
- ◯ secular
- ◯ consecrated
- ◯ religious priest
- ◯ diocesan priest
- ◯ Prefer not to say

* 7. How many dependant offsprings do you live with in this moment?

* 8. What is the highest level of formal education that you have achieved or are in the process of obtaining (if you are still part of a studying program)?

- primary
- lower secondary
- upper secondary
- tertiary
- graduate (I.e. bachelor degree, master degree)
- post graduate (I.e. PhD)
- Prefer not to say

* 9. What is your current employment situation?

- Retired
- Student
- Disabled, not able to work
- Unemployed since less than 2 months
- Unemployed since more than two months
- Fulfilling domestic task
- Employed working from home (agile working)
- Employed working as usual
- Prefer not to say

* 10. How would you define your religious beliefs?

- Atheist
- Agnostic
- Catholic
- Protestant
- Muslim
- Jew
- Prefer not to say
- Other religion

* 11. Do you belong to a religious movement?

- Yes
- No
- Prefer not to say

12. In politics, as of today, do you consider yourself a Republican, a Democrat or an independent?

- Republican
- Democrat
- Independent
- Prefer not to say

* 13. On a scale of 1 to 10 how much do you trust the following authorities:

	1=not at all									10=very much	Prefer not to say
President/Prime minister											
National Parliament											
European Parliament											
Federal Government											
Regional Government											
Local Government											
Political Parties											
Law Enforcement											
National Healthcare Syste											
Military											
Church											

* 14. In general, would you say that:

- Other people can be trusted
- It is better to be very careful
- Prefer not to say

* 15. In general, without taking into consideration the particular situation, which we are currently living, how often do you meet with friends in your spare time?

- ◯ More than once a week
- ◯ Once a week
- ◯ A few times a month (less than 4)
- ◯ A few times a year
- ◯ Never
- ◯ I do not have friends
- ◯ Prefer not to say

* 16. In general, without taking into consideration the particular situation, which we are currently living, how often do you meet with family members or relatives?

- ◯ More than once a week
- ◯ Once a week
- ◯ A few times a month (less than 4)
- ◯ A few times a year
- ◯ Never
- ◯ I do not have family or relatives
- ◯ Prefer not to say

* 17. When was the last time you left your home and went outside?

- ◯ Prefer not to say
- ◯ Number of days

* 18. How many people were you in contact with daily **before** the measures regarding social distancing were

- ◯ Less than 5
- ◯ Between 5 and 10
- ◯ More than 10
- ◯ Prefer not to say

* 19. How many people are you in contact with daily **during** this period of social distancing?

- ◯ Less than 5
- ◯ Between 5 and 10
- ◯ More than 10
- ◯ Prefer not to say

* 20. How much do you agree with the following statements?

	1=strongly disagree									10=strongly agree	Prefer not to say
The world will be seriously affected by the coronavirus	○	○	○	○	○	○	○	○	○	○	○
My country will be seriously affected by the coronavirus	○	○	○	○	○	○	○	○	○	○	○
My family's financial situation will be seriously affected by the coronavirus	○	○	○	○	○	○	○	○	○	○	○
My personal life will permanently change for the **BETTER** after this epidemic	○	○	○	○	○	○	○	○	○	○	○
My personal life will permanently change for the **WORSE** after this epidemic	○	○	○	○	○	○	○	○	○	○	○
The controls of the authorities should be more frequent and the penalties more severe	○	○	○	○	○	○	○	○	○	○	○

* 21. On a scale of 1 to 10 how much do you think the quarantine measures suggested by the local authorities are proper?

1=strongly disagree									10=strongly agree	Prefer not to say
○	○	○	○	○	○	○	○	○	○	○

* 22. Do you believe the quarantine measures to be proper?

- ◯ No
- ◯ Yes, they help me to avoid getting infected
- ◯ Yes, they help to contain the spread of the virus
- ◯ Yes, so they stop me from infecting others in case I am an asymptomatic carrier of the virus
- ◯ Prefer not to say

* 23. On a scale of 1 to 10, how carefully do you respect the rules of social distancing and health prevention?

	1=not at all									10= with great care and attention	Prefer not to say
Staying indoors	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Washing my hands frequently	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Disinfecting all surfaces	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Respecting the social distance of at least 1 metre	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Wearing protection (masks, gloves)	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

* 24. Do you think it is right to penalize, even severely, those who do not respect the rules of social isolation? (I.e. leaving one's home even when not strictly necessary)

- ◯ No
- ◯ Yes, they are putting the lives of others at risk
- ◯ Yes, they are putting their own lives at risk
- ◯ Yes, they are putting my life at risk
- ◯ Prefer not to say

* 25. Have you ever yelled at or scolded someone who in your opinion was not respecting the rules of social isolation? (I.e. leaving one's home even when not strictly necessary)

- Yes, once
- Yes, a few times
- Yes, often
- Yes, I saw someone violating the rules, but I did not intervene
- Yes, I saw someone violating the rules and notified the competent authorities
- No, because I have not seen anyone violating the rules
- Prefer not to say

* 26. Read the following statements on attitudes and behaviours. For each one, consider to what extent you feel capable of experiencing this in the present moment.

	1=I am not able at all									10=I am perfectly able	Prefer not to say
Maintaining a positive attitude											
Maintaining a daily routine											
Looking to my religious / spiritual beliefs to cope with the situation											
Leaning on spirituality / religion to make sense of my life											
Keeping hope alive											
Sharing my concerns with others											

27. What share of the population in your state do you think is complying with the quarantine rules suggested by local authorities?

0 percent 100 percent

* 28. How often did you normally go to church or another place of worship, before the measures on social distancing were adopted?

- Every day
- A few times a week
- Once a week
- A few times a month (less than 4 times)
- A few times a year
- Never
- Prefer not to say

* 29. Compared to before the start of the measures on social distancing, how much has the time that you currently devote to the following aspects of your spiritual life changed?

	1=Not at all									10=Very much	Not practiced in my religion	Prefer not to say
Personal prayer	○	○	○	○	○	○	○	○	○	○	○	○
Eucharistic liturgy	○	○	○	○	○	○	○	○	○	○	○	○
Community prayer	○	○	○	○	○	○	○	○	○	○	○	○

* 30. Did you follow any instances of "virtual" spirituality **before** the measures of social distancing?

	Never	A few times	Often	Every day	Prefer not to say
Collective prayer (e.g. rosary) broadcast on TV	○	○	○	○	○
Collective prayer via social network	○	○	○	○	○
Religious service on TV (e.g. mass / service / Holy Communion / Islamic Friday prayer)	○	○	○	○	○
Religious service via social network (e.g. mass / service / Holy Communion / Islamic Friday prayer)	○	○	○	○	○

* 31. Have you been following any instances of "virtual" spirituality **during** this period of social distancing?

	Never	A few times	Often	Every day	Prefer not to say
Collective prayer (e.g. rosary) broadcast on TV	○	○	○	○	○
Collective prayer via social network	○	○	○	○	○
Religious service on TV (e.g. mass / service / Holy Communion / Islamic Friday prayer)	○	○	○	○	○
Religious service via social network (e.g. mass / service / Holy Communion / Islamic Friday prayer)	○	○	○	○	○

* 32. On a scale of 1 to 10 how satisfactory are:

	1=Not at all satisfactory									10=Very satisfactory	Prefer not to say
Collective prayer (e.g. rosary) broadcast on TV	○	○	○	○	○	○	○	○	○	○	○
Collective prayer via social network	○	○	○	○	○	○	○	○	○	○	○
Religious service on TV (e.g. mass / service / Holy Communion / Islamic Friday prayer)	○	○	○	○	○	○	○	○	○	○	○
Religious service via social network (e.g. mass / service / Holy Communion / Islamic Friday prayer)	○	○	○	○	○	○	○	○	○	○	○

* 33. On a scale of 1 to 10, how much do you agree with the following statements?

	1=strongly disagree									10=Strongly agree	I do not know/ take part in this activity	Prefer not to say
Religious service on TV is just like attending in person	○	○	○	○	○	○	○	○	○	○	○	○
Religious services via social network (for ex. Facebook and YouTube) are like attending in person because they nevertheless enable a certain interaction	○	○	○	○	○	○	○	○	○	○	○	○

	1=strongly disagree									10=Strongly agree	I do not know/ take part in this activity	Prefer not to say
Religious services via social network (for ex. Facebook and YouTube) are just like attending in person even when they are recorded and shown later	○	○	○	○	○	○	○	○	○	○	○	○
Religious services via social network (for ex. Facebook and YouTube) cannot be like attending in person because the physical and personal contact of the community is missing on social networks	○	○	○	○	○	○	○	○	○	○	○	○
Religious services via social network (for ex. Facebook and YouTube) are just like attending in person but only if they are those of my regular community (my parish / mosque/ synagogue)	○	○	○	○	○	○	○	○	○	○	○	○
The level of attention is greater when attending a religious service in person than via social network (e.g. it is easier to get distracted at home)	○	○	○	○	○	○	○	○	○	○	○	○
The level of involvement is greater when attending a religious service in person than via social network (e.g. Facebook and YouTube)	○	○	○	○	○	○	○	○	○	○	○	○
I feel more involved when attending a service in person	○	○	○	○	○	○	○	○	○	○	○	○

* 34. On a scale of 1 to 10, how much do you agree with the following statements?
Religious services onscreen (social network or TV) are:

	1=Strongly disagree									10=Strongly agree	I do not know/ take part in this activity	Prefer not to say
Better because they are more accessible	○	○	○	○	○	○	○	○	○	○	○	○
Better because one does not waste time travelling	○	○	○	○	○	○	○	○	○	○	○	○
Worse because one does not experience them in a holy place	○	○	○	○	○	○	○	○	○	○	○	○
Worse because Eucharist is missing	○	○	○	○	○	○	○	○	○	○	○	○

* 35. **Before the epidemic**, on a scale of 1 to 10, what was the prevalent aspect of your prayer?

	1=not at all									10=mostly	Prefer not to say
I prayed specifically to ask for grace/a miracle	○	○	○	○	○	○	○	○	○	○	○
I prayed to thank and praise God	○	○	○	○	○	○	○	○	○	○	○
I prayed to create a bond with others	○	○	○	○	○	○	○	○	○	○	○
I prayed to cultivate my spiritual life	○	○	○	○	○	○	○	○	○	○	○

* 36. **Since the outbreak began**, on a scale of 1 to 10, what is the prevalent aspect of your prayer?

	1=not at all									10=mostly	Prefer not to say
I prayed specifically to ask for grace/a miracle	○	○	○	○	○	○	○	○	○	○	○
I prayed to thank and praise God	○	○	○	○	○	○	○	○	○	○	○
I prayed to create a bond with others	○	○	○	○	○	○	○	○	○	○	○
I prayed to cultivate my spiritual life	○	○	○	○	○	○	○	○	○	○	○

* 37. On a scale between 1 and 10, these last few days you have:

	1=not at all									10=mostly	Prefer not to say
I prayed for someone's health	○	○	○	○	○	○	○	○	○	○	○
I prayed for the epidemic to end	○	○	○	○	○	○	○	○	○	○	○

* 38. Have you contracted Covid-19 (the Coronavirus) or do you suspect that you have contracted the virus?

- ○ No
- ○ Yes, because I have been tested (swab)
- ○ Yes, I suspect so, because I have been in contact with people who have tested positive
- ○ Yes, I suspect so, because I have the typical symptoms of the infection
- ○ Prefer not to say

39. Taking all things together on a scale of one to ten, how happy would you say you are?

0=very unhappy 10=very happy

40. How do you think your happiness has changed with respect to the period immediately before the pandemic outbreak began in your country?

-5=much unhappier than before 0= as happy as before +5=much happier than before

41. What was a typical weekday like for you **BEFORE THE BEGINNING OF THE EPIDEMIC?** How many hours per normal workday(Monday to Friday, 16 hours) do you spend on the following activities? With whom? Please write only whole hours and use zero if the activity does not apply. Note that the total number of hours per day shall not be higher than 16

	Number of hours	With whom
Job, apprenticeship, second job (including travel time to and from work)		
Errands (shopping, trips to government agencies, etc.)		
Housework (washing, cooking, cleaning)		
Child care		
Care and support for other family members		
Volunteering		
Education or further training (also school, university)		
Repairs on and around the house, car repairs, garden work		
Physical activities (sports, fitness, gymnastics)		
Prayers and attendance of religious ceremonies		
Other leisure activities and hobbies		

42. What is a typical weekday like for you **NOW DURING THE EPIDEMIC**? How many hours per normal lockdown-workday(Monday to Friday, 16 hours) do you spend on the following activities? With whom? Please write only whole hours and use zero if the activity does not apply. Note that the total number of hours per day shall not be higher than 16

	Number of hours	With whom
Job, apprenticeship, second job (including travel time to and from work)		
Errands (shopping, trips to government agencies, etc.)		
Housework (washing, cooking, cleaning)		
Child care		
Care and support for other family members		
Volunteering		
Education or further training (also school, university)		
Repairs on and around the house, car repairs, garden work		
Physical activities (sports, fitness, gymnastics)		
Prayers and attendance of religious ceremonies		
Other leisure activities and hobbies		

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