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Do Religious Contexts Elicit More Trust and Altruism? Decision-Making Scenario Experiments

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We design a decision-making scenario experiment on Facebook to measure subjects' altruism and trust towards attendees of religious service, a fitness class and a local music performance. Secular and religious subjects alike display significantly more altruism and trust towards the synagogue attendees than attendees of the other two non-religious venues. We also find that secular subjects are just as altruistic towards synagogue and prayer group attendees as religious subjects are. These findings support recent theories that emphasize the pivotal role of religious context in arousing high levels of prosociality.

Keywords: Religion; trust; altruism; religious context; religious-secular conflict.

Introduction

A growing body of theoretical and experimental literature associates religion and religious observance with social preferences (Norenzayan *et al.*, 2016). In this paper, we compare respondents' trust and altruism towards anonymous attendees of a religious service with participants at similar non-religious events. To do so, we conduct three plausible decision-making scenarios in Israel on the popular social networking site Facebook.

In a between-subjects design, respondents are asked to imagine that they are travelling in an unfamiliar Israeli town and, according to the scenario, decide to attend a house of worship of their own religion (or a women's prayer group for female subjects), a local music performance of their favourite musical genre, or a fitness class. Respondents are then informed that after the activity, someone from

the prayer, music performance or fitness class approaches them asking to borrow their cell phone.[1] Respondents are asked to indicate how long they would be willing to lend this person their cell phone. We interpret the length of time the respondent is willing to be inconvenienced by lending her cell phone as a measure of her altruism towards attendees of the activity. We also collect a second measure, which we interpret as the respondent's trust in anonymous participants in the activity. Specifically, respondents are told that later in the day they realize that they left their wallet at the religious service, local music performance or fitness centre. They are then asked to indicate the likelihood that their wallet will be returned to them.

As we review below, there is considerable debate among scholars concerning whether religiosity influences prosocial behaviour, and if so, what are the social and psychological factors involved. This study examines the recent argument that religious context is critical in eliciting religious prosociality (Bulbulia, 2012; Norenzayan and Shariff, 2008). Specifically, our research is aimed at assessing to what extent different environments influence trusting and altruistic behaviour towards anonymous individuals. Do religious individuals extend prosocial behaviours outside of religious contexts? And do religious environments elicit prosocial responses from those who are secular?

We find that religious and secular respondents alike are significantly more altruistic and more trusting towards synagogue and prayer group attendees than towards fitness class and music performance attendees. Moreover, and most strikingly, secular participants are no less altruistic towards synagogue and prayer group members than religious participants are. Secular subjects, however, do display lower levels of trust towards attendees of the religious activities than that displayed by religious subjects.

Overall, these findings offer startlingly little evidence for the ongoing and well-documented religious-secular conflict in Israel (see, e.g. BenPorat, 2018; Efron, 2003). Religious respondents are more altruistic in the fitness centre scenario than their secular counterparts and no less trusting or altruistic in either of the secular fitness or music performance settings. And even the most secular among our participants exhibit significantly higher altruism and trust towards synagogue and prayer group attendees than comparable attendees of non-religious activities.

Related Literature

Recent research by economists, psychologists, anthropologists and sociologists has ignited a significant debate regarding religious prosociality (see Norenzayan *et al.*, 2016 and commentaries therein; Preston *et al.*, 2010). Some researchers question whether any relationship between religion and prosocial behaviour exists (Batson

[1]Respondents are told that they have a call plan such that the call will not cost them any money.

et al., 1993; Darley and Batson, 1973; Galen, 2012), while others maintain that such a relationship, repeatedly observed by ethnographers, has now been firmly established through experimental studies (Bulbulia, 2004a; Shaver *et al.*, 2016). For example, in a three-person public goods game and a dictator game, Ahmed (2009) finds that imams-in-training (religious subjects) are more cooperative and more altruistic in the respective games compared to social science students at a local college in India (non-religious subjects). Shariff and Norenzayan (2007) show that subjects are more altruistic in a dictator game when they are primed with religious words in a scrambled sentence paradigm. Studies on Israeli kibbutzim demonstrate that religious kibbutz members are more cooperative in a common-pool resource game than secular kibbutz members (Ruffle and Sosis, 2007; Sosis and Ruffle, 2003, 2004).

Even among those who assert a genuine relationship between religion and prosocial behaviour, substantial disagreement persists over the causes of this relationship. This disagreement concerns whether religious prosociality follows from self-selection or whether there is something inherent in religion that encourages prosocial behaviour. If religion influences prosociality among religious people, what is it about religion that accounts for such a relationship? Most contemporary world religions of course teach their adherents to behave prosocially (Neusner and Chilton, 2005), especially towards in-group members (Wilson, 2002), but anthropologists have noted that even in traditional religious systems that lack such teachings the shared beliefs of a community generate feelings of cohesiveness and solidarity that facilitate prosocial relations (Purzycki and Arakchaa, 2013; RadcliffeBrown, 1952). Other scholars highlight the importance of shared beliefs in supernatural agents that punish those who neglect their social responsibilities (Johnson, 2005, Johnson, 2016; Johnson and Bering, 2006). Still, others suggest that ritual performance creates social bonds that promote prosocial interactions (Alcorta and Sosis, 2005; Power, 2017; Sosis and Alcorta, 2003).

Alternatively, religion may not influence prosocial behaviour directly, but rather those who are more prosocial are simply more likely to become or remain religious. But if religion is associated with increased prosociality through a process of self-selection, how is this process maintained? Some researchers have argued that not only do the costly aspects of religion serve as signals of cooperative intentions, but they also function as gatekeepers preventing those who are not committed to the group and its ideology from entering or remaining in the community (Berman, 2000; Bulbulia, 2004b; Iannacconne, 1992; Ruffle and Sosis, 2007; Sosis, 2003). Since religion is generally a social affair, it is plausible that those who are socially inclined are more likely to be attracted to religious life and thus more willing to endure the costs of entrance and the costs of maintaining one's social standing.

Norenzayan and Shariff (2008) have offered a third explanation that may account both for studies that report a positive relationship between religiosity and prosociality as well as those studies that fail to find any relationship at all. They argue that reputational concerns explain religion's prosociality. Humans are acutely sensitive to reputation building as one's reputation can have substantial effects on one's success in many arenas of life. Religion is a social institution of shared cultural beliefs and behaviours and therefore religious environments and activity evoke reputational concerns and associated prosociality. One implication of Norenzayan and Shariff's approach is that religious prosociality should be context-specific and most operative in settings that bring to mind religious thoughts. Such thoughts trigger reputational concerns vis-à-vis one's deity, oneself or other observers. Thus, when religious subjects are primed with religious thoughts or imagery, prosocial tendencies emerge. Yet, as some researchers have found (Batson *et al.*, 1993), without the religious context, religious individuals behave no more prosocially than others. (Malhotra, 2010) supports this nuanced view: in particular, religious and non-religious individuals are equally likely to respond to a charitable appeal on all days of the week. On Sundays, however, the religious are four times as likely to respond as the non-religious.

These three positions aimed at understanding religious prosociality – inherent features of religion, self-selection and reputational concerns – are not mutually exclusive. Indeed, all three likely play a role in explaining religious prosociality. Nonetheless, resolving the religious prosociality debates and determining what role the various proposed mechanisms play in producing religious prosociality will need to be informed by how religion influences–related social behaviours, such as trust. Similar to the unresolved debates regarding religious prosociality, scholars of religion are also divided into the mechanisms and processes through which religion promotes trust (Sosis, 2005).

It is generally assumed that religious individuals are prosocial and trusting towards fellow members but there is little expectation that these behaviours are extended across community boundaries (Norenzayan and Shariff, 2008; Wilson, 2002). Some theorists, however, have argued that outsiders may use the costly religious behaviours of a community as an informative signal that one can be trusted (Sosis, 2005). Along these lines, Tan and Vogel (2008) show that the trust the proposer exhibits in the trust game increases with the degree of religiosity of the responder. Moreover, in agent-based simulation, Dow (2008) finds that the benefits derived from increased trust afforded by out-group members are critical for the adaptive stability of a religious system. Recent experimental results support Dow's analysis. For example, Hall *et al.* (2015) showed that Christians trusted Muslims who engaged in religious practices, such as adhering to halal dietary restrictions, more than they trusted those who did not. Similarly, McCullough *et al.* (2016) found

that non-Christians were more trusting towards Christians wearing a cross necklace or ashes for Ash Wednesday.

Here we build on this emerging body of work. First, we examine the importance of religious context in eliciting religious prosociality. Are religious individuals altruistic and trustworthy only in a religious context, such as when primed with religious ideas or symbols? Or alternatively, do religious individuals extend prosocial behaviours even in non-religious social environments? Second, do secular individuals respond more prosocially when in a religious environment or in a more familiar secular environment? In other words, can religious environments elicit trusting and altruistic behaviour even among the secular?

Procedures

Methods

Noam Vaza, CEO of Social-ly.com, developed a Facebook application available to researchers for conducting decision-making research and questionnaires. Facebook users were informed that the application had been developed to facilitate decision-making research in the social sciences, and that all research conducted using the application would maintain respondents' anonymity and be used for non-profit, academic purposes only. As an inducement to participate in the research and as the researchers' way of saying thanks, potential participants were told that out of every 50 participants, one would be randomly chosen and awarded a 2 GB flash drive. To minimize subject-pool selection effects, nothing was mentioned about the subject of this research project or its content. The English translation of the questionnaire appears in Appendix.

During the first few days, we publicized the new application on internet forums, at Ben-Gurion University and through Noam Vaza's other Facebook applications, contributing to 667 Facebook users who completed the questionnaire within the first 10 days. An additional 203 users responded over the course of the next month with the remaining 156 spread out over the next several months for a total of 1026 respondents.

This Facebook platform offers several advantages over more typical laboratory experiments or even decision scenarios and questionnaires posted online. Similar to other online platforms available for facilitating academic research such as Amazon Mechanical Turk (MTurk), Facebook offers access to a much larger and more diverse group of users than the typical student subject pool available at a single university.[2] We were able to attract a relatively large sample in a short amount of

[2]Horton *et al.* (2011) discuss the benefits of online experiments in greater detail and replicate three classic laboratory experiments on MTurk.

Table 1. Descriptive statistics.

Variable	Mean	Std. dev.
Time to complete (min)	6.92	15.73
Age (years)	25.27	5.44
Female	0.62	0.48
Secular	0.72	0.45
Born in Israel	0.80	0.40
Religious beliefs (1–7)	3.72	1.80
Religiously active (1–7)	2.32	1.52
Belief in God (1–7)	4.40	2.29
Prayer frequency (1–7)	2.17	1.40
Fitness centre frequency (1–7)	3.87	1.40
Close friends (≥ 0)	5.84	4.26
Borrow car from friends (≥ 0)	4.33	4.34
Fair	0.50	0.50
Careful in trust	0.36	0.48
Willingness to trust (1–7)	3.37	1.04
	$N = 989$	

Notes: Sample contains all Jewish respondents. *Time to Complete*: time required for respondent to complete the questionnaire (measured in minutes). All other variables appear in the questionnaire (see Appendix).

time without the usual vagaries associated with subject recruitment and no-shows. To participate in the experiment, a Facebook user needs simply to log in to her account, download the application to her profile as she would any other Facebook-compatible application and proceed through the questionnaire at her own pace. Facebook's function as a social networking site alleviates concerns that the same user might have multiple accounts or an account using an alias name. This allows us to be relatively confident that each respondent completed the questionnaire only once. Moreover, by downloading any Facebook application, the user agrees to allow the application's developer access to the user's Facebook profile. Where the profile information overlaps with questions that we asked in our questionnaire (e.g. sex, age), we confirmed that the users' responses match the information in their profiles.[3]

The recorded time to complete the questionnaire offers an indication of whether respondents gave thought to their answers. Table 1 reveals that respondents required on average 6.92 min (s.d. = 15.73).

[3]For compelling evidence on the accuracy and reliability of the information in users' Facebook profiles, see Back *et al.* (2010).

In a between-subjects design, each Facebook user who chose to complete the questionnaire was randomly assigned to one of three experimental treatments. Each of the three treatments involves a plausible scenario in which the respondent is asked to imagine that he or she is travelling in an unfamiliar Israeli town and decides to attend a local activity. The three treatments differ according to the nature of the activity. In the *prayer* treatment, male respondents attend a house of worship of their own religion, while female respondents attend a women's prayer group of their own religion.[4] In the *music* treatment, both male and female respondents attend a local music performance of their favourite genre of music. Finally, in the *fitness* treatment, all respondents attend a fitness class at a local fitness centre.

Respondents are then informed that after the activity, someone from the synagogue service/prayer group, music performance or fitness class approaches them asking to borrow their cell phone to contact their parents. Respondents are told to assume that they have free long-distance service so that the call will not cost any money and are asked, 'How long would you be willing to lend this person your cell phone?' Each respondent provides an answer on the following six-point scale: 1 (not at all), 2 (1 min), 3 (3 min), 4 (5 min), 5 (10 min) and 6 (as long as needed).

The assumption that subjects have a call plan is aimed at eliminating possible subject concerns about the monetary cost of the call. Instead, we focus on the time cost or inconvenience that the respondent incurs. Because respondents in the scenario find themselves participating in a one-time activity among strangers in an unfamiliar town, reputational concerns are absent and there are no obvious benefits to lending the cell phone to this person. Thus, a willingness to lend one's cell phone is an act of altruism.[5] We ask whether respondents' altruism towards anonymous group participants varies according to the setting and their perception of group participants. To the extent that subjects identify with the setting or feel an affinity with the attendees, we expect that they will agree to lend their phone for a longer duration in response to the question.

We also collected a measure of respondents' trust of attendees. Immediately following the *cell phone* question, respondents were told that 'Later in the day you realize that you have lost your wallet and that you must have left it at the

[4]This distinction in activities between men and women is natural because while Judaism obligates men to attend synagogue thrice daily, no such requirement pertains to women. Instead, observant Jewish women often gather together in all-women prayer groups (*tefillah* in Hebrew). Furthermore, it is worth noting that some secular and atheistic Israelis pray on occasion (e.g. see Table 5 of Sosis and Handwerker, 2011), and all Israelis are likely to have attended synagogue services at various points in their life for familial obligations.

[5]The presumption is that theft of the respondent's phone is highly unlikely in this group setting. Thus, trust is not the issue at hand. Instead, we interpret the length of time respondents are willing to lend their cell phones as a measure of altruism.

[synagogue/prayer group, music performance or fitness centre]'. They are then asked to indicate on a ten-point scale how likely they think it is that their wallet will be returned to them where one corresponds to 'not at all likely' and ten equals 'extremely likely'. We interpret subjects' responses to this *wallet* question as a measure of their trust or belief in the goodness of anonymous members of the group.

We chose a fitness class as a secular venue because, like prayer in the synagogue or in a women's group, fitness class attendees incur considerable (time and physical) costs engaging in a group activity in pursuit of a common goal. Moreover, fitness classes are typically comparable (or perhaps even smaller) in size to houses of worship and prayer groups. A local music performance was selected as the third venue because music is frequently hypothesized and even demonstrated in both the American (Wiltermuth and Heath, 2009) and Israeli contexts (Anshel and Kipper, 1988) to create solidarity between attendees through similar channels as religion does (Alcorta and Sosis, 2005, Alcorta *et al.*, 2008).

Following the decision scenario and the above two questions measuring altruism and trust towards group members, subjects answered a number of socio-demographic questions, including self-reported measures of their religiosity. The entire questionnaire spanned four screens (see Appendix for the page divisions). To minimize subjects' attempts to provide internally consistent (rather than genuine) responses, we prevented them from returning to a previously completed screen and placed the decision scenario along with our two main questions of interest on the first screen of the questionnaire.

We specifically examine the following:

1. Whether context (synagogue/prayer group, music performance, fitness centre) predicts altruistic and trusting decisions.
2. Whether self-defined religiosity predicts altruistic and trusting decisions.
3. Whether self-defined religiosity and context interact to predict altruistic and trusting decisions.

Sample

Table 1 displays descriptive statistics on our sample. Because the *prayer* treatment involves a Jewish context, we use the responses from question 11 of the Questionnaire to restrict our analysis to the 989 respondents (or 96.4% of the total sample) who indicated Judaism as their religion. Twelve participants took more than two standard deviations above the mean time of 6.9 min (where one standard deviation equals 15.7 min) to complete the survey. We did not exclude these observations from our analyses, however, because their inclusion does not change any of our results.

Table 2. Summary statistics by treatment and population.

Treatment, population	Variable			
	Age	Female	Cell phone	Wallet
Prayer, secular			4.81 (1.36), 178	5.09 (2.36), 181
Prayer, religious			4.85 (1.36), 82	5.67 (2.10), 83
Prayer, total	25.7 (5.9)	0.63 (0.49)	4.82 (1.36), 260	5.27 (2.29), 264
Music, secular			4.06 (1.71), 260	3.37 (2.00), 260
Music, religious			4.08 (1.76), 102	3.60 (2.22), 102
Music, total	24.8 (5.2)	0.64 (0.48)	4.07 (1.72), 362	3.44 (2.07), 362
Fitness, secular			3.94 (1.61), 272	4.43 (2.08), 272
Fitness, religious			4.14 (1.79), 91	4.36 (2.08), 91
Fitness, total	25.4 (5.3)	0.61 (0.49)	3.99 (1.66), 363	4.42 (2.08), 363
Total	25.3 (5.4), 989	0.62 (0.48), 989	4.24 (1.64), 985	4.29 (2.25), 989

Notes: Mean age and gender composition by treatment (columns 2, 3). Mean responses for the two dependent measures (cell phone and wallet) by treatment and according to whether the respondent identified as secular or traditional/religious (columns 4, 5). Standard deviations are in parentheses followed by the number of observations. Due to a technical malfunction with the application, four respondents did not complete the cell phone question in the *prayer* treatment and nearly 100 fewer respondents were assigned to this treatment.

Respondents range in age from 14 to 61 with an average age of 25.3 years old and 62% of our subjects are female. Columns 2 and 3 of Table 2 show the mean age and gender composition are similar and not statistically different across any of the three treatments. Seventy-two percent of our respondents define themselves as secular. As evidence of our largely secular sample, respondents attend a fitness centre much more frequently (about once a month) on average than they do a synagogue (just over once a year).

Results

Table 2 provides summary statistics for our two dependent measures (which we refer to as 'cell phone' and 'wallet') by treatment and by the respondent's self-defined religiosity. Our first main result is that subjects are more altruistic and trusting in the *prayer* treatment than in the *music* and *fitness* treatments. The third row in each treatment-cell reveals that the average response to the cell phone question in the *prayer* treatment of 4.82 is about 20% higher than that of the *music* and *fitness* treatments. Similarly, the average response to how likely their wallet will be returned is 5.27 in the *prayer* treatment, about 20% higher than the *fitness* treatment and over 50% higher than the *music* treatment. To interpret responses to the wallet question in terms of the probability that the wallet will be returned, we can divide

all responses by 10. Thus, subjects in *prayer* assign an additional 0.085 probability that their wallet will be returned compared to *fitness* and nearly 0.20 more compared to *music*.

To evaluate the significance of these differences, we estimate ordinary least squares (OLS) regressions on the cell phone and wallet measures, displayed in Tables 3 and 4, respectively.[6] The first, basic regressions (1) and (7) in each respective table include indicator variables for the *music* and *fitness* treatments with the *prayer* treatment omitted. Both regressions highlight the significantly higher levels of altruism and trust, respectively, in the *prayer* treatment than in either of the other treatments. OLS estimates reveal that participants' average response to the cell phone question is about 0.8 points lower in the *music* and *fitness* treatments than in the *prayer* treatment. The gap between the *music* and *prayer* treatment average response increases to about 1.8 points on the 10-point scale for the wallet question.

It is noteworthy that a t-test of coefficients points to significantly higher trust in the *fitness* treatment than in the *music* treatment ($t = 7.45$, $p < 0.001$). The different natures of the two venues suggest a likely explanation: whereas fitness classes tend to be small, personal and consist largely of regular, repeat attendees, a one-time music performance may conjure up thoughts of a larger, more anonymous event between strangers.[7]

Overall, these results demonstrate that our sample responds much more favourably to anonymous individuals engaged in religious worship than they do to anonymous like-minded individuals attending a local music performance or fitness class. We next address whether this result holds across the respondents' spectrum of religious beliefs or is limited to more religiously observant subjects.

Every Jewish Israeli can instantly define himself or herself as secular, traditional or religious. These terms are shorthand for a host of religious beliefs and practices or lack thereof, as Table 5 confirms. By all four measures of religiosity that we collected, self-defined secular participants are strikingly less religious than traditional participants who are less religious than those who define themselves as religious. For instance, the average secular male attends synagogue somewhere between never and

[6]The relatively large sample justifies OLS regressions. Moreover, it turns out that the predicted values for all observations in all regressions that we estimated are within the six-point and ten-point response ranges of the respective dependent variables. We also replicated the analysis with the Poisson regressions. All of the results are qualitatively identical to this alternative estimation method and available from the authors upon request.

[7]This distinction seems to matter less for the cell phone question, which elicits not the respondents' trust but their sense of affinity with attendees. A music performance of the respondent's 'favourite genre of music' may well evoke greater sentiments of camaraderie and fellowship among like-minded music enthusiasts compared to a more sterile fitness class. These sentiments appear to counterbalance the size and anonymity of the music event for the cell phone question.

Table 3. OLS regressions on *cell phone* responses.

Variable\ equation	(1)	(2)	(3)	(4)	(5)	(6)
Music	−0.757***	−0.775***	−0.893***	−0.902***	−0.776***	−0.760***
	(0.124)	(0.229)	(0.237)	(0.248)	(0.227)	(0.227)
Fitness	−0.831***	−0.711***	−1.198***	−0.936***	−0.719***	−0.678***
	(0.121)	(0.240)	(0.229)	(0.251)	(0.237)	(0.237)
Prayer*secular	—	−0.045	—	−0.068	−0.069	−0.048
		(0.181)	—	(0.178)	(0.182)	(0.183)
Music*secular	—	−0.017	—	−0.013	−0.055	−0.046
		(0.203)	—	(0.205)	(0.201)	(0.200)
Fitness*secular	—	−0.202	—	−0.222	−0.213	−0.204
	—	(0.211)	—	(0.212)	(0.209)	(0.209)
Prayer* prayer frequency	—		−0.015 (0.065)	—	—	—
Music* prayer frequency	—		0.046 (0.065)	—	—	—
Fitness* prayer frequency	—		0.161** (0.065)	—	—	—
Prayer*male	—	—	—	−0.258 (0.178)	—	—
Music*male	—	—	—	0.037 (0.192)	—	—
Fitness*male	—	—	—	0.338** (0.172)	—	—
Male	—	—	—	—	0.029 (0.106)	0.012 (0.106)
Age	—	—	—	—	0.006 (0.010)	0.004 (0.009)
Close friends	—	—	—	—	−0.021 (0.015)	−0.023 (0.014)
Borrow car from friends	—	—	—	—	0.051*** (0.014)	0.049*** (0.014)
Fair	—	—	—	—	—	−0.077 (0.114)
Careful in trust	—	—	—	—	—	−0.117 (0.129)
Willingness to trust	—	—	—	—	—	−0.143*** (0.055)
Constant	4.82	4.85	4.60	4.96	4.60	5.41
	(0.08)	(0.15)	(0.20)	(0.15)	(0.29)	(0.43)
Obs.	985	985	985	985	985	985
Adj. R^2	0.04	0.05	0.05	0.04	0.05	0.06

Notes:***The coefficient is significant at the 1% level.

**The coefficient is significant at the 5% level.

*The coefficient is significant at the 10% level.

The dependent variable is the response to the cell phone question. OLS coefficients with heteroskedasticity-robust standard errors in parentheses.

Table 4. OLS regressions on *wallet* responses.

Variable\ equation	(7)	(8)	(9)	(10)	(11)	(12)
Music	−1.84***	−2.07***	−1.94***	−2.05***	−2.07***	−2.02***
	(0.18)	(0.32)	(0.33)	(0.34)	(0.31)	(0.31)
Fitness	−0.86***	−1.31***	−0.74**	−1.27***	−1.32***	−1.27***
	(0.18)	(0.32)	(0.33)	(0.34)	(0.31)	(0.31)
Prayer*secular	—	−0.586**	—	−0.578**	−0.630**	−0.560**
		(0.289)	—	(0.289)	(0.288)	(0.286)
Music*secular	—	−0.225	—	−0.222	−0.283	−0.255
		(0.252)	—	(0.251)	(0.248)	(0.244)
Fitness*secular	—	0.071	—	0.071	0.048	0.125
		(0.252)	—	(0.252)	(0.248)	(0.248)
Prayer* prayer frequency	—	—	0.074	—	—	—
			(0.094)			
Music* prayer frequency	—	—	0.122	—	—	—
			(0.079)			
Fitness* prayer frequency	—	—	0.021	—	—	—
			(0.082)			
Prayer*male	—	—	—	0.100	—	—
				(0.297)		
Music*male	—	—	—	0.032	—	—
				(0.228)		
Fitness*male	—	—	—	0.005	—	—
				(0.224)		
Male	—	—	—	—	−0.021	−0.051
					(0.142)	(0.139)
Age	—	—	—	—	0.021	0.012
					(0.013)	(0.013)
Close friends	—	—	—	—	−0.016	−0.021
					(0.020)	(0.018)
Borrow car from friends	—	—	—	—	0.066***	0.057***
					(0.023)	(0.021)
Fair	—	—	—	—	—	0.200
						(0.152)
Careful in trust	—	—	—	—	—	−0.547***
						(0.164)
Willingness to trust	—	—	—	—	—	−0.169**
						(0.074)
Constant	—	5.67	5.11	5.63	4.98	5.92
		(0.23)	(0.25)	(0.25)	(0.43)	(1.11)
Obs.	989	989	989	989	989	989
Adj. R^2	0.10	0.10	0.10	0.10	0.12	0.15

Notes: ***The coefficient is significant at the 1% level.

**The coefficient is significant at the 5% level.

*The coefficient is significant at the 10% level.

The dependent variable is the response to the wallet question. OLS coefficients with heteroskedasticity-robust standard errors in parentheses.

Table 5. Religiosity measures by self-definition and by sex.

Variable	Secular		Traditional		Religious	
	Male	Female	Male	Female	Male	Female
Religious beliefs	2.98 (1.64)	3.26 (1.65)	4.81 (1.24)	5.06 (1.25)	5.62 (1.09)	5.87 (0.86)
Religiously active	1.68 (0.92)	1.75 (1.00)	3.17 (1.43)	3.23 (1.28)	5.35 (1.09)	5.26 (1.34)
Belief in God	3.43 (2.20)	3.88 (2.22)	5.52 (1.66)	6.15 (1.27)	6.65 (0.79)	6.74 (0.49)
Prayer frequency	1.70 (0.84)	1.58 (0.72)	3.44 (1.45)	2.50 (0.76)	6.27 (0.87)	4.50 (1.09)
Fitness centre frequency	4.22 (1.39)	3.78 (1.39)	3.68 (1.36)	3.78 (1.48)	3.65 (1.27)	3.52 (1.31)
Cell phone	4.27 (1.56)	4.17 (1.66)	4.50 (1.64)	4.37 (1.70)	3.89 (1.68)	4.30 (1.72)
Wallet	4.26 (2.27)	4.19 (2.21)	4.57 (2.64)	4.47 (2.19)	4.38 (1.98)	4.39 (2.27)
Obs.	259	454	75	118	37	46

Notes: By self-defined religiosity and sex, mean responses (standard deviations in parentheses) for four religiosity measures (questions 13–16 in Appendix), the frequency of exercise at a fitness centre (question 17) and the two dependent measures (*cell phone* and *wallet*).

once a year (see 'Prayer frequency' in Table 5). Traditional males attend between several times a year and once a month, while religious males attend between several times a week and daily. Female frequencies of synagogue attendance display this same ordering across self-definitions of religiosity; however, female levels of attendance are consistently lower than their male counterparts since, as noted in the previous section, there is no religious injunction in Judaism for females to attend synagogue. For the remaining three measures of religiosity, males and females are similarly engaged within each self-definition and there remain substantial differences of religiosity across self-definitions.

To examine whether self-defined secular subjects respond differently in any of the treatments than their religiously observant cohorts, we interact each of the treatment indicators with a dummy variable for secular respondents. None of the interaction terms in (2) is significantly different from zero, indicating that secular participants display similar levels of altruism to traditional and religious subjects in each of the three treatments, including, most notably, the *prayer* treatment. The parallel regression (8) in Table 4 reveals a similar finding for the wallet measure, the one exception being that secular respondents exhibit less trust than their religious

counterparts in the *prayer* treatment. Yet, as the mean wallet responses in Table 2 suggest and a Kruskal–Wallis test confirms, even secular subjects display significantly higher levels of trust in the *prayer* treatment than they do in the *fitness* or *music* treatments ($\chi^2(2) = 68.8$, $p < 0.001$).

For a more continuous measure of religiosity, we can replace the secular-religious distinction with any of the four previously discussed religiosity questions (questions 13–16), each measured on a seven-point scale. For example, regressions (3) and (9) substitute the frequency with which subjects attend synagogue (the *prayer frequency* variable in Table 1 and question 16) for the secular-religious delineation. The highly significant and negative *music* and *fitness* treatment variables demonstrate that altruism and trust continue to be significantly higher in the *prayer* treatment than in either of these treatments. What is more, the high levels of altruism and trust observed in the *prayer* treatment apply equally to those who never or rarely attend synagogue and those who attend regularly. Regression (9) also shows that synagogue attendance is unrelated to wallet responses in the *music* and *fitness* treatments. Yet, more frequent synagogue attendance is associated with higher cell phone responses (more altruism) even in the non-religious *fitness* treatment according to (3).[8]

We also find that the higher levels of altruism and trust in the *prayer* treatment than in the other treatments apply equally to males and females. To begin, the second-to-last and third-to-last rows in Table 5 suggest that within each of the self-defined religiosity measures, males and females give similar responses to the cell phone and wallet questions across all treatments.[9] To determine whether there exist within-treatment differences between the sexes, we interact each of the treatments with an indicator variable for males. As regressions (4) and (10) show, the main treatment effects for *music* and *fitness* continue to be highly significant and negative in both the cell phone and wallet regressions. Five of the six male-treatment interaction coefficients are not significantly different from zero. Only in response to the cell phone question in the *music* treatment do males exhibit significantly different behaviour from females: male responses are on average 0.34 points higher than female responses ($p = 0.05$).

Our questionnaire contains additional socio-demographic questions that may be useful in explaining some of the variance in our dependent measures. Respondents'

[8]These same results (not shown but available from the authors upon request) continue to hold for any of the other three religiosity measures. The lone exception is the *Belief in God* variable: the significant main treatment effects persist, but the interaction of this variable with the *fitness* treatment is no longer significantly different from zero.

[9]Only the last column of religious participants hints at a gender difference for the cell phone measure only. Still, a t-test of means fails to reject the equality of the mean male response of 3.89 and the mean female response of 4.30 ($t = 1.10$, $p = .28$).

age, age squared, political views, whether they were born in Israel and how frequently they exercise at a fitness centre are not significant predictors of the cell phone or wallet responses in any of the regressions we estimated and their inclusion separately or together does not alter any of the results.[10]

We asked two questions about the respondent's number of friends with the thought that more friends might be associated with more prosocial behaviour. Our first question, 'How many close friends do you have?' (labelled 'close friends' in Table 1), displays no significant relationship with either the cell phone or wallet measure. Feedback from subjects on this same question in an unrelated laboratory experiment, however, suggests that the question's vagueness makes it difficult for subjects to answer. Therefore, we asked a second, more specific question on friends, 'From how many friends would you feel comfortable asking to borrow their car for an evening (assuming all of your friends have cars and ignoring insurance concerns)?' (labelled 'borrow car from friends' in Table 1). Interestingly, this more precise measure of close friends shows a highly significant and positive relationship with both the altruism and trust measures. For each additional friend subjects indicate in response to this question, their responses to the cell phone and wallet questions are, respectively, 0.05 and 0.07 points higher on average, as seen in regressions (5) and (11).[11]

Finally, to assess the validity of our dependent measures and how they correlate with more abstract, previously used measures, we asked three context-free questions on a later page of the questionnaire after subjects had completed their responses about prosociality. These questions are labelled 'fair', 'careful in trust' and 'willingness to trust' in Appendix.[12]

[10]When interacted with each of the three treatments, none of the *Fitness Centre Frequency* interaction terms is significant in either the cell phone or wallet regression. Nonetheless, responses to this question provide suggestive evidence that the participants in our experiment identified with fitness class attendees. None of the respondents in the *fitness* treatment – or any treatment for that matter – indicated that they 'never' exercise at a fitness centre. Rather, 'several times a year' and 'several times a week' were the most frequent answers. In a similar vein, the *fitness* treatment elicited significantly more trust than the *music* treatment, as previously noted.

[11]Secular and religious participants indicate almost identical numbers of friends on average from which they could borrow their car (4.23 and 4.37, respectively). Separate interaction terms for secular and religious respondents for the 'Borrow Car from Friends' variable are both highly significant in the cell phone and wallet regressions without affecting the significance of any of the other variables.

[12]Both the *fair* and the *careful in trust* questions have appeared in every wave of the World Values Survey from its initiation in 1981 to the most recently completed the sixth wave from 2010 to 2014. This most recent version can be downloaded at http://www.worldvaluessurvey.org/WVSDocumentationWV6.jsp. Glaeser *et al.* (2000) first introduced the *willingness to trust* question. We include it as a complementary measure to the binary *careful to trust* question.

The finding (displayed in regression (12)) that the *careful in trust* and *willingness to trust* variables are both positive and highly significant predictors of the wallet question (our central measure of subjects' trusting behaviour) attests to the validity and robustness of our dependent measure. At the same time, regression (6) shows that only the *willingness to trust* variable is a significant (and positive) predictor of the cell phone responses, which we interpret as a measure of a subject's altruism rather than of trusting behaviour. Consistent with these interpretations, the fairness question (i.e. whether most people try to take advantage of you or try to be fair (*fair)*) is not a significant predictor of the trust or altruism measures.

Theoretical Explanations

Our results contribute to the current debates concerning religious prosociality. Our finding that the *prayer* treatment elicits more altruism than the music or fitness treatments supports Norenzayan and Shariff's (2008) contention that religious prosociality is environmentally contingent. Their argument about evoked reputational concerns in religious contexts is important because it explains why some researchers have found religious prosociality (Pichon *et al.*, 2007; Shariff and Norenzayan, 2007) and others have not (Batson *et al.*, 1993). Their argument also explains variation in religious prosociality within studies (Malhotra, 2010; Orbell *et al.*, 1992).[13] Specifically, when religious identities and thoughts are primed, reputational concerns emerge which encourage religious prosociality and honesty (RandolphSeng and Nielsen, 2007). When such environmental stimuli are absent, reputational concerns are not triggered and those with religious commitments are no more prosocial than others. Indeed, our results show greater prosociality among self-defined religious and secular participants when imagining being in a synagogue or prayer group than in secular environments. However, the religious are no more prosocial than the seculars in any of our treatments. In other words, religious self-identification does not explain variation in prosociality in our experiments; environmental setting, namely religious and secular differences, does.

Our finding that secular participants are more trusting of synagogue and prayer group attendees than music performance or fitness class attendees has at least two explanations. First and along the lines of Norenzayan and Shariff (2008), secular respondents may recognize that the (religious) individuals attending prayer services

[13]Orbell *et al.* (1992) found that church attendance among Mormons in Logan, Utah, where over 75% of the population are members of the Church of Latter-day Saints, was positively correlated with cooperation toward anonymous strangers in prisoners' dilemma experiments. In a more religiously diverse area, no correlation was found, suggesting that reputational concerns were not evoked in this environment.

are acutely aware of reputational concerns in this religious setting and thus can be trusted. Another explanation is that outsiders to the religious community may use the community's costly religious sacrifices (e.g. regular prayer) as an informative signal of their trustworthiness (Hall *et al.*, 2015; McCullough *et al.*, 2016; Sosis, 2005). If religious individuals are willing to endure such sacrifices to be part of their group, they will also abide by the moral strictures of the group, which typically include virtues such as honesty and fairness. Frank (1988), for example, observes that affluent New York City families place advertisements in the newspapers of Salt Lake City for Mormon governesses for their children. Apparently, 'persons raised in the Mormon tradition are trustworthy to a degree that the average New Yorker is not' (Frank, 1988, p. 111). Similarly, Paxson (2004) argues that Sikhs are recognized by non-Sikhs as trustworthy trading partners, even without a history of prior exchanges. Non-Sikhs can utilize Sikh religious signals, such as the five K's[14], as a 'seal of approval' signalling trustworthiness. The external displays indicate that the individual has already endured the monitoring systems within Sikh communities that allow him to maintain his membership.

Conclusions

Social scientists have recently begun to seek explanations for the perdurance and vitality of religion throughout the world. Part of this pursuit uses experimental methods to explore behavioural differences between religious and non-religious individuals. Previous studies have shown that subjects trust anonymous religious partners more than non-religious partners in trust game experiments (Tan and Vogel, 2008). Common-pool resource experiments have shown greater cooperation among members of Israeli religious kibbutzim than their secular counterparts (Ruffle and Sosis, 2007; Sosis and Ruffle, 2003, 2004). Experimental and theoretical work suggests that environmental context is critical in eliciting religious prosociality (Norenzayan and Shariff, 2008; Shariff and Norenzayan, 2007; Wilson *et al.*, 2017). Our study complements this literature with plausible decision scenarios in religious and non-religious contexts. While laboratory experiments offer the advantage of monetary incentives to induce reliable measures of behaviour, the games are abstract. Although our decision scenarios are imagined, they evoke distinct settings in which to compare the prosociality of religious and non-religious respondents.

[14]The five K's are Kes, Kangha, Kara, Kirpan and Kache ra: unshorn hair and beard and wearing a comb, steel bracelet, sabre and breeches. Additional constraints on Sikh behaviour, such as refraining from alcohol and tobacco and the requirement to pray five times daily, serve as additional signals further marking Sikhs' distinctiveness.

We find that religious institutions generate significantly higher levels of altruism and trust than comparable non-religious institutions. This result holds for religious and secular respondents alike. In fact, for the most part, secular subjects display levels of altruism and trust that are similar to those of their religious counterparts in all three settings. Most surprisingly, the most secular respondents who never or rarely attend synagogue are just as altruistic towards synagogue attendees as devoutly religious respondents.

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Appendix

Cell Phone and Wallet Questionnaire[15]

(Respondents were randomly assigned to the prayer, music performance or fitness centre treatment. For the prayer treatment, according to their gender revealed in their Facebook profile, males were assigned to treatment 1 and females to treatment 2.)

1 Religious Service, Male

1. Imagine that you are travelling in a town in Israel in which you've never been before and you decide to attend a house of worship of your own religion. After the service, someone who also attended the service approaches you and asks to borrow your cellular phone to contact their parents. Assume that you have a free long-distance service so the call will not cost you any money. How long would you be willing to lend this person your cell phone?

1. Not at all
2. One minute
3. Three minutes
4. Five minutes
5. Ten minutes
6. As long as needed

[15]The questionnaire on Facebook appeared in Hebrew and is available upon request.

2. Later in the day you realize that you have lost your wallet and that you must have left it at the house of worship that you attended. How likely do you think it is that your wallet will be returned to you?

1 2 3 4 5 6 7 8 9 10
Not at all likely Extremely likely

2 Religious Service, Female

1. Imagine that you are travelling in a town in Israel in which you've never been before and you decide to attend a women's prayer group of your own religion. After the prayers, someone who also attended the prayer approaches you and asks to borrow your cellular phone to contact their parents. Assume that you have a free long-distance service so the call will not cost you any money. How long would you be willing to lend this person your cell phone?

1. Not at all
2. One minute
3. Three minutes
4. Five minutes
5. Ten minutes
6. As long as needed

2. Later in the day you realize that you have lost your wallet and that you must have left it at the place of the prayer group that you attended. How likely do you think it is that your wallet will be returned to you?

1 2 3 4 5 6 7 8 9 10
Not at all likely Extremely likely

3, 4 Music Performance, Male and Female

1. Imagine that you are travelling in a town in Israel in which you've never been before and you decide to attend a local music performance (of your favourite genre of music). After the performance, someone who also attended the performance approaches you and asks to borrow your cellular phone to contact their parents. Assume that you have a free long-distance service so the call will not cost you any money. For how long would you be willing to lend this person your cell phone?

1. Not at all
2. One minute
3. Three minutes
4. Five minutes
5. Ten minutes
6. As long as needed

2. Later in the day you realize that you have lost your wallet and that you must have left it at the music performance that you attended. How likely do you think it is that your wallet will be returned to you?

1 2 3 4 5 6 7 8 9 10

Not at all likely Extremely likely

5, 6 Fitness Centre, Male and Female

1. Imagine that you are travelling in a town in Israel in which you've never been before and you decide to attend a fitness class at a local fitness centre. After the class, someone who also attended the class approaches you and asks to borrow your cellular phone to contact their parents. Assume that you have a free long-distance service so the call will not cost you any money. For how long would you be willing to lend this person your cell phone?

1. Not at all
2. One minute
3. Three minutes
4. Five minutes
5. Ten minutes
6. As long as needed

2. Later in the day you realize that you have lost your wallet and that you must have left it at the fitness centre. How likely do you think it is that your wallet will be returned to you?

1 2 3 4 5 6 7 8 9 10

Not at all likely Extremely likely

——————————————— new screen ———————————————

All participants (Variables names reported in Table 1 and the regression tables appear italicized in parentheses)

The following three questions concern your perception of other Israelis.

3. (*Fair*) Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair?

a. Would take advantage
b. Would try to be fair

4. (*Careful in trust*) Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?

a. Most people can be trusted
b. Need to be very careful

5. (*Willingness to trust*) On a scale from 1 to 6, how would you rate your willingness to trust others?

__ 1 (Always trusting)
__ 2
__ 3
__ 4
__ 5
__ 6 (Always careful)

———————————— new screen ————————————

6. When did you join Facebook (indicate as best as you remember)?

1. Less than 1 month ago
2. Up to 3 months ago
3. Up to half a year ago
4. Up to one year ago
5. More than one year ago

7. (*Age*) Age: _____

8. (*Female*) Sex: Male Female

9. How would you characterize your political views?

1. Very conservative
2. Conservative
3. Moderate
4. Liberal
5. Very liberal

10. Were you born in Israel?

a. Yes
b. No

11. Please indicate your religion:

1. Judaism
2. Islam
3. Christianity
4. Other_____

12. (*Secular*) How would you define yourself:

1. Secular

2. Traditional (*Masorti*)
3. Religious (*Dati*)

——————————————— new screen ———————————————

13. (*Religious beliefs*) Please rate the strength of your religious or spiritual beliefs?
1 2 3 4 5 6 7
None Very strong

14. (*Religiously active*) How religiously active are you?
1 2 3 4 5 6 7
Not at all Very

15. (*Belief in God*) Please rate your belief in God:
1 2 3 4 5 6 7
No belief Absolute belief

16. (*Prayer frequency*) How often do you attend a house of worship (church, mosque, synagogue)?

1. Never
2. Once a year
3. Several times a year
4. Once a month
5. Once a week
6. Several times a week
7. Daily

17. (*Fitness centre frequency*) How often do you go to a fitness centre to exercise?

1. Never
2. Once a year
3. Several times a year
4. Once a month
5. Once a week
6. Several times a week
7. Daily

18. (*Close friends*) How many close friends do you have?

19. (*Borrow car from friends*) From how many friends would you feel comfortable asking to borrow their car for an evening (assuming all of your friends have cars and ignoring insurance concerns)?

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