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DISCUSSION PAPER SERIES

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ABSTRACT

Honesty toward the Holy Day*

We study the effect of religiosity, gender, and “day of the week”, on the level of honesty by conducting under-the-cup experiment among religious and secular, female and male Jewish students. We show that the level of honesty among religious subject, males and females, increases as the day of the experiment is closer to the upcoming Saturday, the Jewish holy day. We also found that the “Saturday effect” does not exist among secular subjects. In addition, we found that the religious females show the highest level of honesty, especially on Thursday. Finally, we derive practical implication from our study.

JEL Classification: C91, D63, Z12

Keywords: gender effect, holy day effect, honesty, religiosity

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1. Introduction

How is honesty affected by gender, religiosity, time, and rewards (physical or emotional)? Several studies examined the gender effect and found unclear results. Dreber and Johannesson (2008), Houser et al. (2011), as well as Erat and Gneezy (2012), found evidence that compared with females, males are more likely to lie to gain monetary rewards. Azar et al. (2013), studied dishonesty of customers in restaurants by conducting a field experiment in which customers received an excessive change of 10 or 40 NIS (about 3 US dollar or 12 US dollar). They found that females were more inclined to return the extra change than males, both among one-time and repeated customers. They also found that repeated customers returned the excessive change much more often than one-time customers did. Azar et al. (2013) also found that the larger amount of excessive change, 40 NIS, was returned much more often than the smaller amount of excessive change, 10 NIS. This result contrasts Gneezy (2005) who found that higher stakes on both sides (the cheater and the cheated) increased deception in the sender-receiver game experiment. Similarly, Aoki et al. (2010) showed that gender effect does not play a role in a lying confession game following Gneezy (2005).

Fischbacher and Föllmi-Heusi (2013) did not find evidence for a gender effect on the level of honesty in their die rolling experiment. Muehlheusser et al. (2015) used the setting of Fischbacher and Föllmi-Heusi (2013) to provide evidence that gender composition is particularly important under a group decision making, but does not play a role at the individual's level. Simon (1990) provided a theoretical rationale for the evolutionary success of social norms, such as honesty, based on docility and inability to distinguish between socially prescribed behaviors that contribute to group fitness and those that reduce individual's fitness.

Shalvi and Leiser (2013) showed that religious female students judge lying more harshly than secular female students, and found weak evidence that this moral judgment translates into more honesty. Arbel et al. (2014) studied the effect of religiosity and gender on the level of honesty among Jewish students and found the highest level of honesty among young religious Jewish females and the lowest, among secular Jewish females. They did not find statistically significant difference in the level of honesty between orthodox and ultra-orthodox males although these two groups were found to be more honest compared with secular males.

Hugh-Jones (2015) finds that honest behavior is positively correlated in a coin-flip and a quiz experiments. Yet, a self-report honesty questionnaire about whether lying in one's self-interest is justifiable, fails to predict behavior in both experiments. At the same time, Hugh-Jones (2015) also included self-report questions about whether the respondent has engaged in any one of four ethically questionable actions in the previous twelve months (e.g., avoiding fare on public transport, fabricating information on a job application, etc.). Reports on unethical actions do predict dishonesty in both experiments. These findings suggest that questions about actual participation in specific forms of dishonest behavior may be better predictors of dishonesty in incentivized experiments than general self-report questions about honesty. Schurr and Ritov (2016) finds that the experience of winning in a competition, in itself, yields a tendency toward dishonest behavior.

Several papers examined the effect of time on the level of honesty. Shalvi et al. (2012) showed that dishonesty increases when subjects face time pressure in the form of insufficient time to fully contemplate their reporting decision. Gottfredson and Hirschi (1990) found that the primary cause of an unethical behaviour is a low self-control, namely, the tendency of individuals to pursue short-term gratification without consideration of the long-term consequences of their acts. Ruffle and Tobol (2014, 2016) showed that temporally distancing the decision task from the payment of the reward increases honest behavior. Kouchaki and Smith (2014) revealed that adults engaged in less unethical behavior were more honest in the morning compared to the afternoon.

Mood treatments were shown to be effective in invoking honesty. Mazar, Amir, and Ariely (2008) asked students to write down the Ten Commandments (moral reminder) before commencing the task of finding and reporting the number of pairs of numbers adding up to 10 in a set of matrices. The authors found that following the moral reminder, the average reported number of pairs, and thus the average monetary reward, decreased compared with the control group, who was not given a moral reminder.

In this paper, we examine the level of honesty “closer to” and “farther from” the upcoming Saturday, the Jewish holy day.¹ Cultural context play an important role in human behavior

¹ Shabbat, the seventh day, is the holy day in Judaism. It starts on Friday night and ends at Saturday night. Religious Jews refrain from work activities on Shabbat and dedicate the day to praying. Shabbat observance is considered as one of the most important commandments of Judaism. Naturally, we could not conduct our experiment on Shabbat.

(Herrmann et al. 2008; Gächter et al. 2010). In this line, we take advantage on the fact that the effect of the same moral reminder may differ across types of population and days of the week. We conducted under-the-cup die experiment (see also Fischbacher and Föllmi-Heusi 2013) among religious and secular Jewish students, females and males, on different days of the week, Monday and Thursday. We found that the average reported die outcomes of religious Jewish students, females and males, were lower on Thursday than on Monday, reflecting more honesty on Thursday than on Monday. In contrast, we did not find evidence for a "Saturday effect" among secular students.

The paper proceeds as follows: Section 2 presents the experimental design. Section 3 presents the results of the experiment. Finally, Section 4 presents a summary and discussion.

2. Experimental design

We conducted an under-the-cup die experiment among a sample of 358 first year undergraduate students, males and females, secular and religious Israeli Jews, studying at the Jerusalem College of Technology (JCT) in Jerusalem and the Carmel Academic Center (CAC) in Haifa. The JCT is a Jewish Orthodox academic college and therefore its students are all religious Jews. The CAC is a regular college, the students of which are mostly secular.

The objective of the experiment was to study the effect of the time until the upcoming Shabbat (Saturday), the Jewish holy day, on the level of honesty among groups that differ by religiosity and gender. We carried out two sessions among first year students. The first session was carried out in 2014, on Monday, and the second session in 2016, on Thursday. Both sessions took place simultaneously at the two academic institutions. Consequently, no information could have been passed between the groups of subjects.

We conjectured that the "Saturday effect" would affect differently on religious subjects, who consider Saturday as a holy day, and secular subjects, who do not. To refine the effect of religiosity as much as possible, we used a passive moral reminder and not an active one, since an active reminder, such as writing or reading the Ten Commandments prior to the experiment, could have affected also secular students.² We conducted the experiment on Monday and

² Ruffle and Tobol (2014, 2016) did not find a significant difference based on religiosity in an under-the-cup die experiment conducted among soldiers. Moreover, soldiers demonstrated a lower level of honesty on Thursday

Thursday. Monday is far enough from the last holy day, Saturday, and in addition, far enough from the upcoming Saturday. In contrast, Thursday, the last full day of studies, is close enough to the upcoming Saturday. Moreover, the two days are sufficiently distant from each other to capture any "day of the week" effect on the level of honesty.³

Two days prior to the actual experiment, notices were posted at the various campuses, stating only that participation is on a voluntary basis and that subjects will be paid for participating. In each session, the research assistant called the students, one at a time, to enter a class with two entrances. Each subject entered through one designated entrance and left through the other to prevent any leakage of information. Once inside, the research assistant read the rules of the experiment from a script to the student. Namely, the student was told that she would be asked to privately roll once a fair six-sided die behind a curtain and then to report the outcome to the research assistant. For each reported point, the student was paid 10 NIS (approximately \$2.6) and another additional 20 NIS (approximately \$7.7) as a show-up fee. For example, if the subject reported "4", then she was paid a total of 60 NIS (approximately \$15.6), 40 NIS (approximately \$10.4) for the report, and an additional 20 NIS (approximately \$5.2) as a show-up fee. After rolling the die, the subject filled out a short questionnaire that included a report on his gender, religiosity, and die outcome.⁴ The subject handed the questionnaire to the research assistant, in return received his reward, and thus concluded the experiment.

3. Results

We examine the level of honesty by comparing the average reported die outcome to the expected one in a fair die roll (i.e., 3.5), for each group.⁵ Table 1 displays the average die outcomes stratified by days and religiosity and show that in contrast to the secular subjects, the religious

compared with Sundays, probably since the reward was an early leave on Thursday. Thus, the reward dominated the effect of religiosity.

³ Arbel et al. (2014) conducted under-the-cup die experiment among religious and secular, male and female, Jewish students on Tuesday and Wednesday, although on different dates. They deliberately conducted the experiment on the middle of the week in order to avoid a potential bias arising from the fact that Orthodox and ultra-Orthodox Jews consider Saturday as a holy day. They did not find statistically significant differences in the level of honesty among religious subjects on Tuesday and Wednesday.

⁴ See the instructions of the experiment and the questionnaire in the appendix.

⁵ The expected outcome of fair die throw is $\frac{1}{6} \sum_{i=1}^6 i = 3.5$.

subjects are more honest on Thursday compared with Monday (their average reported die outcome is significantly lower at the 5% significance level).

<Insert Table 1 here>

However, a Chi-squared test shows that only among the religious students on Thursday, we cannot reject the null hypothesis that the distribution of the die outcomes was drawn from a uniform distribution. Yet, we reject the null hypotheses that the average die outcome reported by both religious and secular students, on Monday and Thursday, is equal to 3.5 at the 1% - 5% significance level.

Table 2 displays the average die outcomes stratified by days, gender, and religiosity. Table 2 shows that in contrast to their secular counterparts, the average die outcome reported by both religious females and males, is lower on Thursday compared with Monday (the differences across days are significant at the 5% significance level for religious male students and at the 10% significance level for religious female students).

<Insert Table 2 here>

In addition, we cannot reject the null hypothesis that the average die outcome reported by religious females on Thursday equals to 3.5. Furthermore, a Chi-squared test shows that we cannot reject the null hypothesis that the distribution of die outcomes of both religious female and male students on Thursday was drawn from a uniform distribution. The results displayed in Table 2 are in line with Arbel et al. (2014) and show that religious females show the highest level of honesty while the secular females exhibit the lowest level of honesty. Nevertheless, this study adds and shows that the level of honesty among the religious subjects, males and females, is also affected by the "Saturday effect".

Figures 1 and 2 display the outcomes distributions stratified by days, religiosity, and gender. The figures further illustrate the results and show that the source to the deviations of the average die outcomes from 3.5 is, as expected, excessive reports on die outcomes of 5 and 6.

<Insert Figure 1 here>

<Insert Figure 2 here>

Table 3 displays the outcomes of a regression analysis where the dependent variable is the reported die outcome (*Die*), and the explanatory variables are *Religious* (1 if the subject is religious and 0 if the subject is secular), *Female* (1 if the subject is a female and 0 if the subject is a male) and *Thursday* (1 if the subject participated in the experiment on Thursday and 0 if the subject participated in the experiment on Monday).

<Insert Table 3 here>

Regression (A) shows that for the entire sample, the average reported die outcome of the religious subjects is significantly lower than the average reported die outcome of the secular subjects by 0.316 (significant at the 5% significance level). The average reported die outcome on Thursday is significantly lower than the average reported die outcome on Monday by 0.337 (significant at the 5% significance level). Regression (B) shows that in the sample of religious subjects, females' reported die outcome is lower than the males' by 0.436 (marginally significant at the 10% significance level). The average reported die outcome of the religious subjects on Thursday is lower than their average report on Monday by 0.678 (significant at the 1% significance level). Regression (C) shows that as expected, none of the explanatory variable is significant. The F-Statistic in regression (A), the full sample, is 2.83 and it increases to 6.15 in regression (B), the sample of religious subjects. In contrast, the F-Statistic in regression (C), the sample of secular subjects, equals to 0.26, implying that the explanatory variables are statistically equal to zero.

4. Summary and discussion

We have shown that the level of honesty among Jewish subjects differs by gender, religiously and the time until the upcoming Saturday, the Jewish holy day. More specifically, we found that in contrast to the secular subjects, religious subjects exhibit a higher level of honesty on Thursday compared with Monday. We also found that religious females exhibit the highest level of honesty.

We conjecture that the closeness to Saturday creates a “mood treatment” for people who treasure the holy day, or maybe Saturday serves as a “purification time” for people who want to enter the upcoming holy day with a clean conscience. Thus, even a passive moral reminder, namely, one that does not involve an act prior to the experiment, like writing down the Ten Commandments, when given to the proper population, play an important role in determining the level of honesty. Nevertheless, we saw that the "Saturday effect" weakens at a sufficient distance from the reference time (i.e., on Mondays) only to get stronger again toward the upcoming holy day. Notice that Monday and Thursday are both two days apart from Saturday⁶, namely, the effect of the holy day is temporary, rather than a lasting effect.

Lying is wrong in most cultures and religions, yet, we know that honesty is hard to follow. We surmise that in the context of honesty, the role of Saturday for religious Jews is similar to the role of Jiminy Cricket for Pinocchio, namely, reminding the right and wrong. This may imply that honesty should be constantly be reminded and educated for.

Several practical implication arises from our study with respect to future studies and real-life. Future studies should consider the cultural setting of experiments, such as the proximity of the experiment day to dates of sanctity, or memorial, and the gender composition of the group of subjects. With respect to real life, our findings may imply that proximity to holy days or days of importance may invoke honesty and thus may well serve in real life situations in which honesty is valuable, such as job candidates' interviews, business meetings, and exams.

⁶ Ignoring the fact that Shabbat starts on Friday late evening and ends about 25 hours later on Saturday, rather than at midnight.

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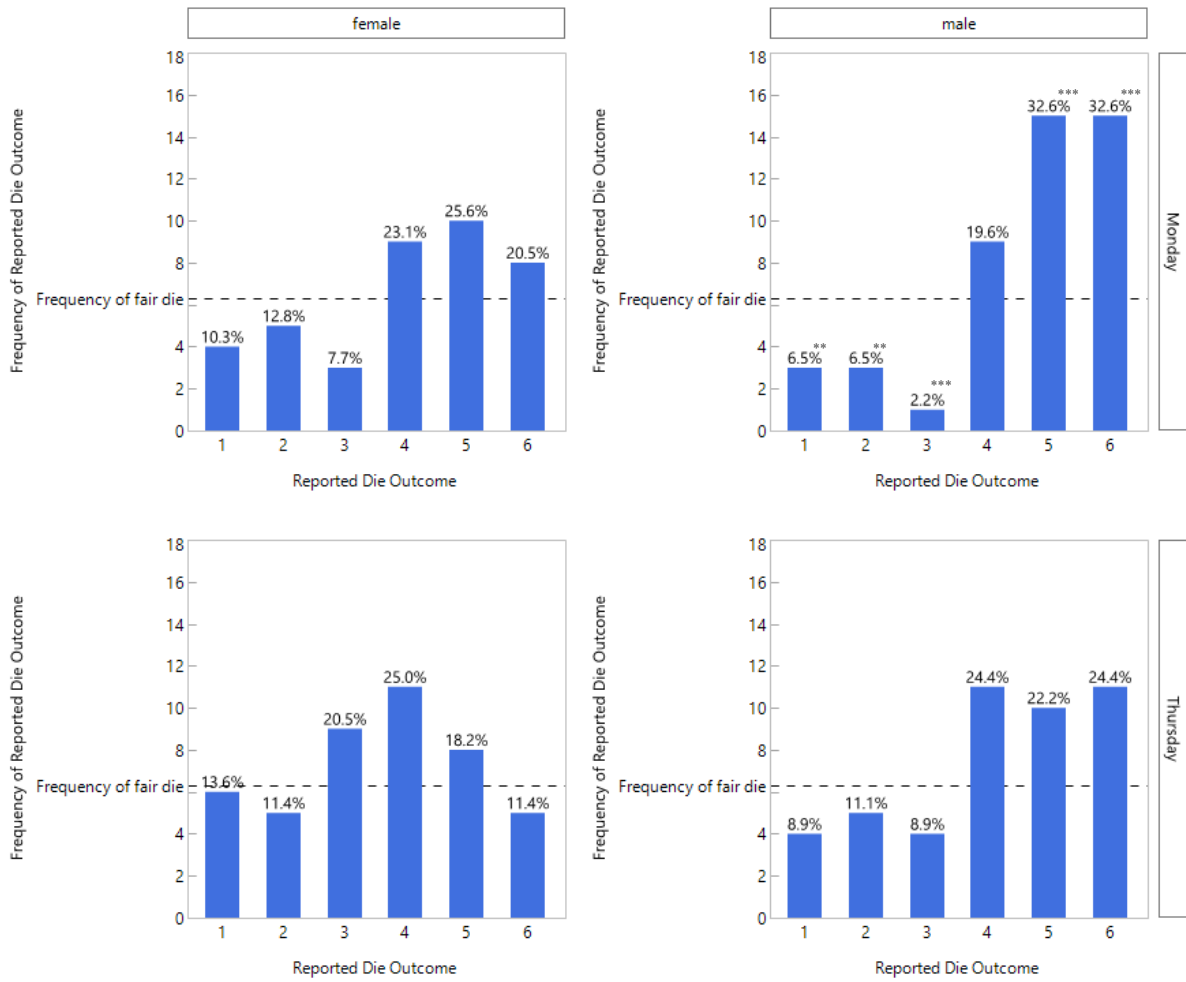
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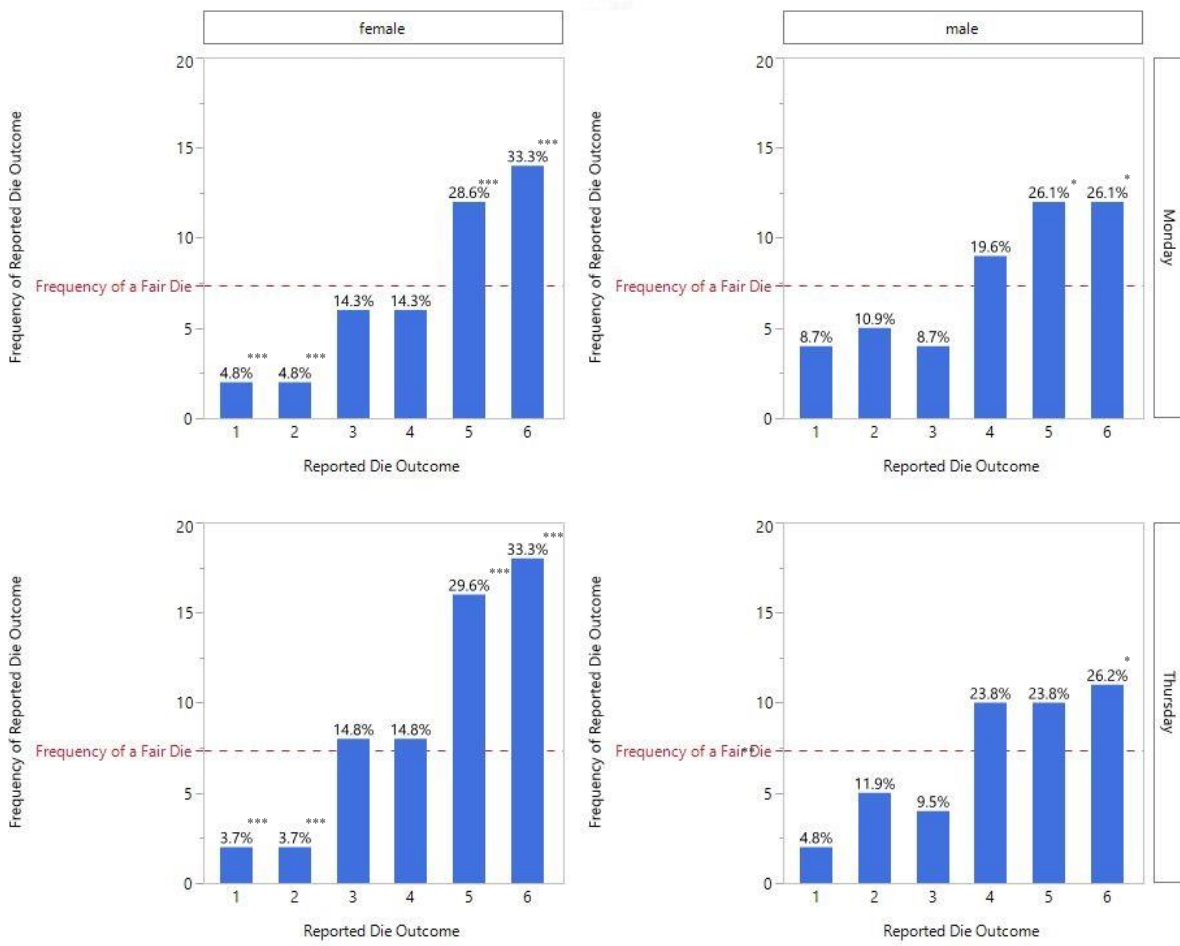
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Figure 1: Reported die outcomes frequencies of the religious subjects by gender and days



Notes: Stars display the significance of a two-sided binomial test that the observed percentage differs from 1/6 at the * 10%, ** 5% and *** 1% significance level respectively.

Figure 2: Reported die outcomes frequencies of the secular subjects by gender and days



Notes: Stars display the significance of a two-sided binomial test that the observed percentage differs from 1/6 at the * 10%, ** 5% and *** 1% significance level respectively.

Table 1: Average die outcomes stratified by days and religiosity:

| | Monday | | Thursday | | Difference |
|--------------------|-------------------------------|--------------|-------------------------------|--------------|-------------------|
| Religious students | 4.35 ^{###} (1.56) | χ^{+++} | 3.85 ^{##} (1.59) | χ | 0.5 ^{**} |
| Observations | 85 | | 89 | | |
| Secular students | 4.49 ^{###} (1.46) | χ^{+++} | 4.48 ^{###} (1.43) | χ^{+++} | 0.01 |
| Observations | 88 | | 96 | | |
| Difference | -0.13 | | -0.63 ^{***} | | |

Notes: Standard deviations appear in parentheses. #, ##, ### : greater than the average of fair die: 3.5 at the 10%, 5% and 1% significance level respectively. *, **, ***: significantly different from zero at the 10%, 5% and 1% level respectively. χ^+ , χ^{++} , χ^{+++} : the reported distribution is significantly different from uniform distribution at the 10%, 5% and 1% level respectively.

Table 2: Average die outcomes stratified by days, gender, and religiosity

| | Monday | | Thursday | | Difference |
|-------------------|-------------------------------|--------------|-------------------------------|--------------|-------------------|
| Religious females | 4.02 ^{##} (1.63) | χ | 3.57 (1.55) | χ | 0.45 [*] |
| Observations | 39 | | 44 | | |
| Religious males | 4.63 ^{###} (1.47) | χ^{+++} | 4.13 ^{###} (1.6) | χ | 0.5 ^{**} |
| Observations | 46 | | 45 | | |
| Difference | -0.61 ^{**} | | -0.56 ^{**} | | |
| Secular females | 4.74 ^{###} (1.33) | χ^{+++} | 4.63 ^{###} (1.38) | χ^{+++} | 0.11 |
| Observations | 42 | | 54 | | |
| Secular males | 4.26 ^{###} (1.55) | χ^+ | 4.28 ^{###} (1.5) | χ^+ | -0.02 |
| Observations | 46 | | 42 | | |
| Difference | 0.48 [*] | | 0.35 | | |

Notes: Standard deviations appear in parentheses. #, ##, ### : greater than the average of fair die: 3.5 at the 10%, 5% and 1% significance level respectively. *, **, ***: significantly different from zero at the 10%, 5% and 1% level respectively. χ^+ , χ^{++} , χ^{+++} : the reported distribution is significantly different from uniform distribution at the 10%, 5% and 1% level respectively.

Table 3: OLS regression analysis

| VARIABLES | (A) (Full) <i>Die</i> | (B) (Religious) <i>Die</i> | (C) (Secular) <i>Die</i> |
|------------------|-----------------------------|----------------------------------|--------------------------------|
| <i>Religious</i> | -0.316** (0.159) | - | - |
| <i>Female</i> | -0.137 (0.159) | -0.436* (0.231) | 0.153 (0.215) |
| <i>Thursday</i> | -0.337** (0.159) | -0.678*** (0.231) | -0.00758 (0.214) |
| Constant | 4.414*** (0.161) | 4.735*** (0.197) | 4.408*** (0.200) |
| Observations | 358 | 174 | 184 |
| R-squared | 0.025 | 0.067 | 0.003 |
| F-Statistic | 2.830 | 6.153 | 0.257 |

Notes: The dependent variable in the all of the regressions is the reported die outcome. Regression A is for the full sample: religious and secular students. Regression B is for religious students and regression C is for secular students. All the independent variables are dummies: *Religious* equals to 1 if the student is religious and 0 otherwise. *Female* equals to 1 if the student is a female and 0 if the student is a male. *Thursday* equals to 1 if the student participated in the experiment on Thursday and 0 if he participated in the experiment on Monday. Standard errors appear in parentheses. *, **, ***: significantly different from zero at the 10%, 5% and 1% level respectively.