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Throwing the die in Georgia: Does swearing an oath make students report honest answers?

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Abstract

Plagiarism, cheating on college admission test or tax evasion are acts of dishonest behavior and it is important to understand this behavior in order to reduce the loss in tax revenue and provide equal access to higher education. This study adds to the growing academic literature that examines the topic of dishonesty by conducting a die-in-a-cup experiment in combination with an oath treatment in Georgia and answering the following questions: Do students in Georgia act dishonestly? If so, can an oath increase the level of honesty? This study shows that this particular oath script reduces the amount of highest reported outcome by 15%, compared with the baseline. However, no significant differences in the distribution between the oath treatment and the baseline are found. In addition, this thesis finds significant reporting of the highest outcomes for individuals sitting in the back of the classroom.

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Master's thesis in Economics

Spring 2019

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Acknowledgement

I want to start with by thanking my supervisor Peter Martinsson, who came with clear and to-the-point feedback that helped make this thesis what it is. Furthermore, I want to thank Keteven Gurchiani at Ilia State University in Tbilisi, Georgia that made it possible for me to conduct the experiment. A special thanks to Rusudani Kochiashvili as she has been the acting experiment leader during all experiment sessions, helping to conduct the experiment and with all other small practicalities, without her the experiment would be impossible to do. Herman Andersson for whom I could call to get ideas and suggestions. A big thanks to Lisa Norrgren as she contributed with the original idea and was part of the thesis during the entire process. In addition, I want to thank the Quality Assurance Office at Ilia State University that were willing to contribute with time, classrooms and invaluable feedback. I want in particular thank Giorgi Odoshashvili for his willingness and energy in supporting this experiment.

For the funding, I want to thank SIDA and the Minor Field Study-program that funded this experiment. I want also to thank all the wonderful people I got to know during my stay in Tbilisi. Selam Petersson, Zurab Abrahamshvili, Sergey Salyshev, Thomas Wier, Timothy Bluevelt. Lastly, I want to thank everyone that supported me; my family, close friends and class mates.

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Introduction

Cheating, fraud or tax evasion is not what most people tend to do; nonetheless, these behaviors certainly exist and have a tremendously negative impact on society. One recent example is the tax fraudsters in the EU, where 50 billion € were stolen from EU governments through a so-called “VAT-carousel”, an elaborate system to cheat VAT taxes from the different tax authorities within EU countries (Schumacher, 2019). Other types of dishonest behavior are also prevalent in societies across Europe. For example, cheating on an admission test for a university or plagiarizing during an exam. In May 2016, the Swedish Public Broadcaster (SVT) uncovered that some 80 individuals in Sweden cheated on the Swedish Scholastic Aptitude Test (Högskoleprovet) (Bezzazi, 2016). In Ukraine, in a study from 2017, Denisova-Schmidt and Prytula (2017) find that amongst university students, staggering 93 percent admitted that they had plagiarized other students’ assignments. Further east, in Georgia, before the Rose-Revolution¹, there was common practice to cheat on university admission tests (Gabadava, 2013), though in 2004, Georgia enacted a reform to centralize and standardize admission for universities to get rid of the corruption. It is essential to change such behavior and have policies in place that deter people from acting dishonestly. Preventing mendacious behavior is not just important for the taxpayer, but also for other values which are vital to have in a society, as fairness and equal opportunity for access to higher education.

In recent years there has been increasing interest and research devoted to understanding what affects honesty and cheating and in particular intrinsic honesty (Fischbacher and Föllmi-Huesi, 2013; Arbel et al., 2014; Jacobsen & Piovesan, 2016, to name a few). As these examples from Sweden, Ukraine, and Georgia show, even with an authority (in the form of an exam conductor or teacher) in the room and the possible risk of punishment, dishonesty and cheating still occur during an exam. To increase the level of honesty an oath can be used. For example, in the prominent paper by Jaquiment et al. (2013) the use of an oath increases the sincerity of the participants when bidding on a hypothetical good. The purpose of having an oath² is according to the theory of commitment from social psychology (Kiesler, 1971), and aims to increase the commitment to a particular behavior in the future.

Fischbacher and Föllmi-Huesi (2013) pioneered a simple die-throwing experiment on how to uncover honesty among individuals. The experiment is straight forward, each participant receives a die and a cup, and are informed that for every side of the die, there is a different

¹ The Rose-Revolution was a peaceful revolution in 2003 that ousted the former Soviet strongman Eduard Shevardnadze and reform-oriented Mikhail Saakashvili got elected as president in January 2004 (Fairbanks, 2004). The post-Rose-revolution period was marked by tremendous reform effort that got rid of the entrenched corruption within Georgia. For a detailed review of the reforms see World Bank (2012).

² In this thesis, an oath is to commit to a certain future behavior, for example, to promise to answer truthfully.

monetary payoff (i.e. one=1€, two=2€, etc., up to five, and six receives no payment)³. Each participant then rolls the die in private and report the outcome to the experimenter. Since the actual outcomes of the die-throws are unknown, the experimenters cannot know on an individual level the actual outcome for each of the participants. However, the underlying distribution of the die-throwing is known in an infinite sample is 1/6. Thus, cheating is measured on a group level, by comparing the distribution and the different frequencies of the reported throws.

This study adds to the growing honesty literature by addressing the following questions: Do students in Georgia act dishonestly? If so, can an oath increase the level of honesty? Additionally, this paper explores whether or not the physical distance to the experiment leader can affect honesty. To answer these questions, a die-in-a-cup experiment following the design by Fischbacher and Föllmi-Huesi (2013) was conducted. The experiment was conducted at the Ilia State University in Tbilisi, Georgia. A between-subject design is used: for each session students are divided into two groups - baseline and oath treatment. The proximity towards the experiment leader can be identified by the seat numbers, to explore if sitting closer to the experiment leader (perceived to be monitored) affects the reporting of the die-outcome. The oath treatment is added in instructions, which are handed out before the experiment starts. The oath script comes from the adoption of a text used at Ilia State University to lower plagiarism. The payoffs are 1= 3 GEL, 2=6 GEL, 3=9 GEL, 4=12 GEL 5=15GEL and 6=0 GEL. Additionally, each participant received 5 GEL⁴ for participating in the experiment. The students that receive the oath script are expected to lie less, report lower proportions of number fives than the baseline and the proximity towards the experiment leader is expected not influence the oath treatment.

The results shown in this study indicates that an oath script has a small effect on increasing the level of honesty among students in Georgia, as the reported number five decreased with 15%. Furthermore, the results show that students sitting in the front rows of the classroom tend to report lower outcomes and thus gives an indication to the perception that being monitored matters for honesty. This thesis adds to the economic literature by addressing dishonesty in a developing county, as there have only been a handful experiments regarding honesty in developing countries (E.g. Gächter and Schulz, 2016; Békir et al., 2018; Hanna and Wang, 2017). In particular, this study adds to the literature in how a simple oath script can have an impact on honestly and increases the knowledge on the effect of the participants' perception of being monitored on honest behavior.

³ The reason why 6 is mostly without payment in these kind of experiment is according to Fischbacher and Föllmi-Huesi (2013): "*Subjects who rolled a 6 could feel unfairly treated and tempted to correct this unfairness by reporting a higher number*" (Fischbacher-Föllmi-Huesi, 2013, p.529)

⁴ 1 GEL correspond approximately to 3,5 SEK or 0,33 EUR. GEL stands for Georgian Lari.

Literature review

This literature review aims to provide the reader with an overview of the experiments done within the scope of this study; this means studies similar to this thesis and the monitoring and oath literature are connected to the die-experiment. For a recent review of the honesty literature, see Jacobsen et al. (2018).

Honesty literature within the context of the experiment

The die-in-a-cup experiment that was pioneered by Fischbacher and Föllmi-Huesi (2013), is a straightforward experiment. In general, the experiment conducted in private by letting a subject roll a 6-sided die and then report the outcome to the experimenter. The subject receives the information that each side of the die corresponds to different monetary payoffs (in most experiments there are payoffs for all numbers except for the number six, which has no payoff). Only the reporting of the die is known for the experimenters, to uncover dishonesty for the entire group, the distribution of the reported die-outcome can be compared with the underlying random process which is known ($1/6$ for a fair 6-sided die). There is no chance (other than subjectively perceived chance) for the subject to be caught lying; therefore, the subject can lie without consequences or punishment for dishonest behavior. By remaining anonymous, this type of experiment captures the intrinsic (dis)honesty of individuals. Fischbacher and Föllmi-Huesi (2013) find evidence of “partial cheating” that means that individuals do not lie fully, rather they cheat by reporting a slightly higher number, for example if the subject true outcome is 2, the subject reports 3.

Since the inception of the die-experiment, there has been a plethora of experiments trying to understand dishonest behavior. Jacobsen and Piovesan (2016) conducted a field experiment at a shopping mall in Denmark and explored the relationship between individuals' responses to higher taxes and dishonesty. In one treatment they tax the higher outcomes (4, 5 and 6) with a 50% marginal tax-rate and find significantly higher reporting of the numbers '5' and '6' in the tax-treatment compared to the baseline. These authors argue that individuals use the marginal-tax as justification for their dishonest behavior.

The impact of religion on honesty has also been studied in the context of this experiment. Bar-El and Tobol (2017) find that compared to secular Jewish university students, Jewish religious university students became more honest when Shabbat (the upcoming Saturday), was approaching, thus confirming the notion that religious individuals tend to be more honest. Arbel et al. (2014) confirms these findings and adds that most significant dishonest individuals were female secular students, though no difference between secular male students. Utikal and Fischbacher (2013) gives additional support that religion matters for honesty and find evidence of disadvantage lying. Compared to students, nuns under-report the die-outcomes in the die-experiment. However, their sample size is small (the samples

of nuns were 12, and 19 for students) and nuns are not representative of religious individuals. However, this gives evidence that the perception of honesty is more important than being honest since nuns swear religious vows to be truthful and these authors argue that the nuns have an incentive to keep that promise, even though the nuns might not be truly honest in their reporting.

There have been some studies with honesty in developing countries, in the context of this experiment (Gächter and Schulz, 2016; Hanna and Wang, 2017; Lowes et al., 2017; Békir et al., 2018). Hanna and Wang (2017) adopted the die-experiment by letting students in Indian universities roll a 6-sided die 42 times in private. They find a relationship that those individuals that are dishonest (as a measure for corruption) have a higher propensity to want to work in the government. By letting students throw the die 42 times, the anonymity of the experiment might vanish, if the students (who were master students) had some knowledge of statistics, they would know that they could be identified as being dishonest on an individual level, which therefore would make the results biased and students might underreport their actual dishonest behavior. In the cross-country study of 23 countries, including Georgia (which is where this study is also conducted), Gächter and Schulz (2016) finds that dishonest behavior is associated with the perception of rule following. This result indicates that in countries where rule-following is the norm, individuals behave more honestly.

Fischbacher and Föllmi-Huesi (2013) showed that by increasing the amount of cash a participant receives (by the multiple of three from the baseline) the amount of lying does not change significantly, indicating the size of the monetary incentive does not increase the amount of lying. However, their study was conducted in Switzerland, a country with substantially higher mean income than Georgia, their increase from 1 to 3 CHF might not be a big jump when the mean income is already high. To support this claim Kajackaite and Gneezy (2017) find that increase the payout from 1€ to 50€ does not change the amount of lying. The reason behind this is the perceived fear of getting caught, which increases with the pecuniary amount as Ekman (1988, 2009) and Vrij (2008) argue. This means that if the potential payoff increases the cost of lying also increases. Within a gain-and-loss frame, Charness et al. (2019) find no significant difference in dishonest behavior.

Ariely et al. (2019) compares individuals coming from eastern Berlin (former DDR and under influence of communism) with individuals western Berlin (former BRD under the influence of capitalism). The authors find those from eastern Berlin are more likely to act dishonestly and argues that an economic system can influence honesty of individuals long after the system does not exist anymore.

Abeler et al. (2014) conducted an experiment where they called individuals at home and asked them to toss a coin, and if they reported tail, they would receive 15 EUR. They find that, surprisingly, that most individuals were honest, getting close to 50%. A caveat though is the anonymity broke as soon as the participants wanted to collect their cash, which required them to hand out personal information; thus, individuals who wanted to be anonymous were not in the sample, and these individuals might have been dishonest.

In a recent experiment, Cohn and Maréchal (2018) answers the question, whether or not a laboratory experiment for cheating, throwing a fair coin ten times can predict school misconduct. These authors find that students who presumably cheat more in the coin throwing experiment, tend to misbehave more at school. This experiment gives evidence that particular type of honesty experiments, can actually predict behavior associated with disobeying of rules in the “real-world”.

Oath and honesty

The main idea behind an oath script (honor code) is to increase the level of commitment to a specific behavior, which comes from the theory of commitment from social psychology (Kiesler, 1971). Therefore, an oath aims to increase the cost of lying and make the individual commit to a particular future action. Mazar et al. (2008) argue that an oath or moral stands remind individuals of their moral standards and thus decrease the dishonest behavior. In the influential paper by Jaquiment et al. (2013), the authors let participant sign a solemn oath, before bidding on a hypothetical good, and find that the oath increases the sincerity of the participants and lowers dishonesty. Carlsson et al. (2013) use an oath script to elicit honest answers in a willingness to pay questionnaire. They find that with the oath script the variance of answers decreases and gives evidence that an oath script impacts the behavior of an individual and increases the commitment of the participants when answering hypothetical questions. Buccioli and Piovesan (2011) conducted an experiment on 160 kids (age 5 to 15) in Italy, by letting them toss a fair coin, with black and white sides and report the outcome. The kids received a reward if they got the white side and reported it. One group of kids was told explicitly not to lie and report the true outcome, which decreased the probability of reporting the white side by 16%. Though, not being an oath, this supports the result verbal commands can mitigate cheating behavior.

In Austria, newspapers are bought from stand-alone newspaper stands, the buyer puts money in a box next to the newspaper pile. By exploiting this environment, Pruckner and Sausgruber (2013) find that by reminding newspaper-buyers with a moral reminder “*the paper costs 60 cents, thank you for being honest*”, is more useful to increase honesty, than a legal reminder. Beck et al. (2018) combine the die-experiment and an oath script and experiment with 396 students from the university of Kassel, Germany. They had several treatments among others, 29 students swore an oath by signing their signature, to provide

honest and truthful answers. These students, compared to the baseline, reported a lower percentage of number 5's (which the highest outcome) and their average payoff was significantly lower than the baseline, which indicates that signing an oath can increase commitment and lower dishonest behavior.

Monitoring and honesty

There is a relationship between monitoring and honesty, according to the literature. Rose-Ackerman (1975) argues that being surveilled can increase the moral cost because the individual would question the morality of their decision and rethink the action. Kroher and Wolbring (2015) find evidence that supports this notion. They let individuals roll the die in front of another randomly selected individual, without explicitly telling the other individual to monitor the throwing individual. They find with this treatment, the level of honesty increases (although only temporarily). By conducting a laboratory experiment (solving a task within 5 minutes) in Tunisia, Békir et al. (2018) find that monitoring together with moral sanctioning increases honesty. Beck et al. (2018) find that in their monitoring treatment, no differences were reported compared to the baseline in the die-in-a-cup experiment, though there seems to be an indication that the level of acquaintance between the player and the one monitoring affects the degree of lying. As the level of acquaintance increases, the degree of dishonesty increases. The result from Beck et al. (2018) suggests that being monitored by an "anonymous" individual (such as an experiment leader) would increase the level of honesty.

This literature review shows that the die-experiment has not yet been done in combination with an oath script in a developing country. There have been a handful of experiments done in developing countries (Gächter and Schulz, 2016; Békir et al., 2018; Hanna and Wang, 2017). Though Gächter and Schulz (2016) have provided considerable and important insights into understanding dishonesty in a cross-country context. The vast majority of the experiments were conducted in western countries (Switzerland, Germany, Italy, Israel) which are considerably more affluent than Georgia. By conducting this experiment in Georgia, this study expands the knowledge on how an oath script affects honesty within a university context in a developing country.

Experimental design

Before plunging into the theoretical part, the method is explained and how the experiment in Georgia was conducted. Then the theoretical underpinnings are explained, describing what the theory predicts and the conjectures.

Method

The die rolling experiment from Fischbacher and Föllmi-Huesi (2013) is adapted, by adding an oath and controlling for the distance from the experiment leaders. In this type of experiment, participants are informed that each side of the die is rewarded with a corresponding amount of money. Participants then roll the die in private (only the subject know the true outcome of the roll) and report the outcome to the experiment leader. On an individual level, the participants can anonymously decide whether or not to act maliciously, with impunity.

In this experiment, the baseline follows Fischbacher and Föllmi-Huesi (2013) and consisted of two groups in a between-subject design. The oath treatment had the following oath script; *I confirm that the document I submit to the research includes true answers, the provisions are indicated in the prescribed manner.* With the answer alternatives; (1) *I confirm* and (2) *I do not confirm*.⁵ This oath is similar to the one the Ilia State University uses to decrease plagiarism, which the students were already familiar with. The oath purpose is to increase the commitment of the participant to report honest answers.

Each participant received 5 GEL for participation in the experiment and the additional payment from the die roll. Each side of the die corresponded to the following amount; 1 = 3 GEL, 2 = 6 FEL, 3 = 9 GEL, 4 = 12 GEL, 5 = 15 GEL and 6 = 0 GEL. For example, if a participant reported the number '3' she received 9 GEL plus the 5 GEL for participating in the experiment, in total 14 GEL. For reporting the number '6', the participant received 0 additional payment, only the participation fee of 5 GEL. For comparison, the cost of producing one Khachapuri is 3,51 GEL (approximately 1,15 EUR) (ISET Policy Institute, 2019), a traditional Georgian dish, bread filled with cheese, which is often eaten during lunch or dinner and is comparable to a regular priced lunch at the university. Once every participant was done with the experiment, the participants were called up, one by one, to come to the front of the classroom, to the teacher's desk, and turn in the instruction sheet and envelope. The participants had to show the instructions sheet to the experiment leader in order to get paid.

⁵ Due to the translation, the wording is different than one would expect. The original oath can be sent upon request.

As several studies have found (Fischbacher and Föllmi-Huesi; Kajackaite and Gneezy, 2017) bigger monetary rewards do not influence the level of cheating. This can't be controlled for in this thesis, however, one can argue that the monetary rewards are significantly higher in relation to the mean income in Georgia than the experiments cited in the literature review. Thus, there might be a reason to think that the reference point for Georgians are on a lower level and there is diminishing returns of money, though with increasing monetary payoffs the moral cost would increase (Ekman 1988, 2009; Vrij, 2008), therefore these two effects could cancel each other out. Hence, the amount of payment given to the subjects will not have an impact on the reporting of answers in this experiment.

The experiment was conducted in classrooms at Ilia State University in Tbilisi, Georgia, during the first week of the spring semester 2019, 19th to 22nd of March. For each experiment session, approximately half of the seats in the classroom were equipped with a pencil, a die, and a cup. On the top of the cup, there was a small hole in which the outcome of the die roll could be seen; only the subject was able to see the outcome, which kept the die roll private (see appendix for a picture). Upon entering the classroom, the participants were randomly seated, by taking a number out of a bag and find the seat according to the number. Once every participant was seated, the experiment leader instructed them how to do the experiment. Then, the written instructions were provided. Finally, a closed envelope with a questionnaire was handed out. The participants were instructed to throw the die once and write the outcome on the second page of the instruction paper, and then, they could open the closed envelope and start filling out the questionnaire. During the verbal instructions, the participants were shown how to throw the die and made a practice throw to both show that the die was not loaded and how to throw the die during the experiment (see appendix for the oral instructions).

Compared to Fischbacher and Föllmi-Huesi (2013), the participants were only allowed to throw the die once, as explained in Fischbacher and Föllmi-Huesi (2013), their reason for letting the participants throw two times was to make it “...*imposable for the experimenter to find out what number a subject actually rolled*” (Fischbacher and Föllmi-Huesi, 2013, p. 529). Hence, their objective was to make the experiment more anonymous. In this experiment, to make sure the experimenter leaders did not know what the participant rolled, the participants were asked to put the cup the right side up with the die inside after they were done with the experiment. In this manner, the experimenters could not know what each individual rolled (other than what the individual reported). Additionally, the participants were instructed to fold the instruction sheet once they had filled in the die outcome, which kept the outcomes of their throw anonymous and decreased the chance any other participants would know there are different instruction sheet during one session.

An average experiment session followed this timeline; 0 min: Preparation of the classroom started. After 15 min the students were let into the classroom. After 17 min the participants were given the mentioned above instructions. After 22 min the instruction sheets and questionnaire were handed out. After 35 min all the participants were finished, and the payments ensued. After 40 min the experiment session was over. On average one session took 25 minutes to complete and in total 40 minutes including the preparation.

To make sure there were no language barriers and that the experiment felt as if it were conducted by local staff from the university, the experiments were conducted in the Georgian language, similar to Gächter and Schulz (2016). The non-native experimenter held a low profile during the sessions and interacted only when it was necessary. The instructions, questionnaire, and manuscript were first written in English and then translated into Georgian, and then translated back into English. The last translation was to make sure that the first translation from English into Georgian was correct and different people did these translations⁶.

In order to ensure that the payments were made anonymously to the participants, the following procedure was used: the payments were prepared in advance before each session. For each outcome an envelope with cash was filled, all envelopes were the same. Each envelope was filled with the same number of coins (but different value), such that when a participant received an envelope and shook it, no one would know how much cash there was in the envelope, because of the sound the different envelopes made were similar. For distribution of the envelopes, a box with six compartments was used, in which the envelopes for each outcome was placed, on the box, there was no indication in which compartment the envelopes were in. Only the experimenters knew in what compartment the different envelopes were in. In addition, the box was under the teachers' desk during the experiment, such that the participants receiving an envelope were unable to see from which compartment the envelope was taken from. These procedures ensured that no one except for the experimenters knew what amount each participant received. This procedure also increased the anonymity, for those individuals that would want to have their die-outcome and payment remain anonymous.

Design of treatment

As the theory suggests, the oath aims to increase in a future commitment and, in this case, foster honesty in the die-experiment. In addition, the oath chosen ensured that the students were familiar with the wording. This, however, has its drawbacks as individuals that have seen similar wording might not change their behavior, Still, according to the feedback from

⁶ Upon request, the Georgian versions of these documents can be sent.

both groups, from the administration and student, both claimed that an oath that the students are familiar with would increase the level of honesty.

To arrive at the oath that was used in this experiment, there were several feedback sessions with focus groups to determine the appropriate oath that would fill the purpose of achieving honesty among students in Georgia. In the feedback sessions at the university, there were total of four different oaths. Two of which came from the Georgian criminal law, these were (translated into English) and are similar to the Anglo-Saxon law tradition;

1. *Before you start filling in the questioner can you swear to God that you will answer only the truth and you will not hide anything.* With the alternatives; (1) *Yes, I swear and (2) No.*
2. *Before you start filling out the questioner can you confirm by your consciousness and responsibility that you will answer only the truth and hide nothing.* With the alternatives; (1) *Yes, I confirm and (2) No, I don't confirm.*
3. *Can you promise us, that you will be truthful while writing your experiment outcome?* With the alternatives; (1) *Yes, I promise and (2) No*
4. *I confirm that the document I submit to the research includes true answers, the provisions are indicated in the prescribed manner.* With the alternatives; (1) *I confirm and (2) I do not confirm.*

The third oath came from a paper by Carlsson et al. (2013), but with an adjustment to make sure that it would fit this experiment. The fourth oath (which was chosen) came from a text that Ilia State University uses to lower the amount of plagiarism when handing in a piece of work, for example, a master thesis or a PhD dissertation. Compared with Jaqument et al. (2013) where they let the participants sign a solemn oath, it can be argued that signing an oath versus ticking a box is different, thus the increase in cost of lying might differ. However, the choice to have this type of “signing” made it possible to keep the experiment anonymous and avoid individuals’ personal signatures, which could have led to ethical question how to handle the signatures after the experiment was conducted, which is outside the scope of this thesis.

In the student sample of the focus group (consisting of four law students and one engineering student), the reaction to the first oath was laughter. They also have never heard the second oath before ⁷. The focus group preferred the oaths number three or four, however the last oath, all students thought that it would achieve the highest degree of honesty. The focus group preferred the fourth oath due to the fact that the oath is academic

⁷ One reason why this type of oath is unfamiliar and made students laugh, is due to the fact that Georgia use have a soviet criminal law in which the witness in a court was informed that if she speaks untruthful there is a punishment Razi (1960). Thus students were not custom to Anglo-Saxon law tradition.

and that they have read a similar version of this oath before with similar wording. According to the administration at the Quality assurance Office of Ilia State University, the opinions were split. The third oath was kinder and not that strict; however, the administration personnel pointed out that to achieve the greater honesty, the last oath is preferable.

The choice to add the oath script to the instructions on the top of the second page instead of the instruction sheet, instead of this text; *Before you start rolling the die please indicate below that you have read and understood the instructions.* This offered the opportunity to hand out the instructions in such a manner, that the first page, which was shown to the students, was the same and the students could not know in which group they were in, such that the between-subject design is possible. The aim was to make sure there was a belief in the room that everyone received the same instruction sheet. Additionally, this offers the sample to be divided between the similar type of individuals. Before each experiment the introduction sheet was randomly mixed (oath and baseline), such that they were randomly handed out during the experiment.

Design of instructions

On the first page of the instructions, the experiment is explained and the payoff-scheme is displayed (see appendix). On the second page, the respective group (baseline and oath treatment) is written together with the same payoff-scheme. The instructions are similar to Jacobsen & Piovesan (2016) since they conducted their experiment using pen and papers, not in an experiment lab and how the information for the payoffs was shown made it very easy to understand. To have a very easy-to-understand payoff scheme is especially important when conducting an experiment in a different country. By having the payoff-scheme on both sides of the instructions sheet, the participants would know when reading the first page of what payment what each number corresponds to and when they turned the instructions paper to the second page, they would also see, while filling in the outcome of the die roll, what each die roll corresponds to. This made it very clear for the participant what each die side corresponds to in GEL. Furthermore, similar to Fischbacher and Föllmi-Huesi (2013), this made it easier to lie, i.e. lowering the cost of lying. Therefore, having the information of the pecuniary award visible when the participants were writing down the outcome, tempted the subjects to write down a higher number than what she rolled.

To test the instructions and procedure, a pilot session was arranged with real money. The aim of this session was to mimic the real experiment, to find any improvements and see how the students reacted to both the written instructions and the verbal instruction. In this session, there were no mention of consequences for rule-breaking nor the use of a smartphone during the experiment. It was noted that the students were talking with each other and that students were using their phones after they were done with the experiment,

but before they received their payment. Therefore, a consequence for rule-breaking at the beginning of the written instructions as well as in the oral instructions was added, which is custom in experiments. The behavior of talking and using a phone during an experiment session, could affect the outcome if students inform other students about the treatment and experiment, which would prepare students in advance, and could lead to overreporting of higher die-outcomes, which otherwise wouldn't happen (for subjects repeating the same experiment, see Fischbacher and Föllmi-Huesi, 2013).

Sample selection

The choice to conduct the experiment at the beginning of the spring semester was for the following reasons; (i) students choose among several courses and used the first week to try out different classes, which meant there are many different students in a lecture because they have not yet chosen the courses they will take for the rest of the semester (ii) the first week of classes are introductory classes (iii) lecturers not plan for the entire lecture, which increased the chance to be allowed to conduct the experiment in classes, since the experiment helped the lecturers to fill the lecture time. Taking this together, means the sample have a higher probability to capture the characteristics of the population as well as decrease the self-selection bias.

By restricting the experiment only to the first week of the spring semester, I wanted to minimize the possibility that students would know in advance about the experiment and that there would be less spillover between treatments (participants could tell each other how to answer to maximize their payoffs). Furthermore, by having the experiment only in the first week, and not go over the weekend, this restricted the gossip at the university and the spreading of the knowledge of the experiment. According to Fischbacher and Föllmi-Huesi (2013) by knowing about the experiment in advance, the level of cheating increases.⁸

The experiment rooms were selected based on the size of the classroom since Ilia State University did not have an experimental lab. The chosen classrooms had to be big enough, such that could space out the seats and prepare for the experiment. The classrooms chosen were in three different sizes 20, 28 and 30 seats (approximately half of the total seating) after the seating configuration was done (see the picture in appendix). Once the classrooms were chosen, the schedules of the lectures, that were to be held in these rooms, were requested and were made available from the university administration. Emails were sent out via the internal mail system to each lecturer in which the experiment was explained and asked to use 20 minutes at the beginning of their lecture to conduct the experiment. In the case a lecturer did not respond, the lecturer was called the day before the scheduled

⁸ A Mann-Whitney test shows that there is no difference in the reported die-outcome between the first 6 sessions and the 6 last experiment sessions ($p=0,283$).

class and was asked for permission. The students were informed via email one day in advance before each session, that an experiment will be held; there was no mention of any monetary reward in the email to the students. The experiments were conducted at the beginning of a lecture, and the participants could freely choose whether or not they want to be part of the experiment, by attending the beginning of the lecture.

In total 14 different lecturers were asked. Only one lecturer did not want the experiment to be conducted in their class. The experiment was conducted in 13 different classes during the four days of the experiment; the first class was the pilot session. The attendees of different classes were crossed checked. 13 out of 436 students had signed up to two lecturers and, 2 out of 436 students signed up to 3 of these classes. To check for any overlapping students, the local experiment leader contacted the 13 students and asked them only to attend one of the experiments. The selected classes included topics like; history, linguistics, political science, math and poetry. By recruiting students via classes instead of through a laboratory's database, for example ORSEE (Greiner, 2004) (which this university didn't have) or advertising the experiment at the university (as is common in experimental economics). I could get a sample that is closer to the true student population at the university and reach individuals that otherwise would not want to attend an experiment.

Questionnaire design

The overarching theme when constructing the questionnaire was to limit the collection amount of personal information that could identify the students later on and to have a high as possible level of anonymity. Each question aims only to gather that information necessary to control for the main biases and factors that would influence honesty in this setting. These are incorporated in the questions below. The questionnaire is used as control variables in the regression later in the thesis.

The seat number in the upper right corner of the instructions and questionnaire was added for two reasons, first to match the instructions with the questionnaire, since they were put in different places. Second to use as the distance from the experiment leader (teachers' desk) and to construct the variable front-half later on⁹.

The question age captures whether or not a student is in the bachelor level (17-21 years) or master's level (22-25 years) this is according to the Ilia State University. Since most students that complete a bachelor's degree, are in the bracket, 17-21 years. Regarding the effect ages have on honesty, the results are mixed (Gino and Margolis, 2011; Gino and Pierce, 2009).

⁹ It is the perception of being further away from the experiment leader that matters, thus not the physical distance (in meters for example). The perception among individual is considered to be heterogeneous with in the sample, hence splitting the sample will have the same probability of getting different individuals in the two groups.

Under the idea of social anonymity (E.g. Millgram 1970; Gächter and Herrmann, 2011) and individuals that live in cities feel more anonymous, the question of whether or not the student comes from a city or village was therefore added. This question is different from Gächter and Schulz (2016); where they asked from which city (bigger than 10 000) they are from. Because in Georgia, according to the focus groups and the administration at Ilia State University, students that would report that they were from, for example, the second biggest city, Kutaisi, would indicate that they are from Kutaisi, even though they come from a village outside Kutaisi. Therefore by having the type of question that Gächter and Schulz (2016) had would give misleading answers and not capture the social anonymity¹⁰.

By using the question; *how many friends did you have during the experiment session*, a similar writing and the question as Gächter and Schulz (2016) was used to control for anonymity. Students with many friends would lie more since individuals who see other cheating will tend to behave more dishonestly (Gino et al., 2009). A vital difference compared to Gächter and Schulz (2016), is that they asked the students, upon leaving the classroom, how many they had known during the session, where in this study the students were asked in the questionnaire. The change is essential, since the recruitment of the students was not on campus, instead via an entire class. Students might have gone with other students in the same class again (from the previous semester) and thus they would not be anonymous towards each other. By asking this question, it was possible find out whether the friends influenced the reporting of the die-outcome.

The question number 7; *Generally speaking, on a scale from 1 to 5, would you say most people can be trusted or you need to be very careful in dealing with people. Please specify the appropriate number*, is from World Value Survey (Inglehart et al., 2014) and is also used by several scholars (Zak and Knack, 2001; Knack and Keefer, 1997) to measure the general trust in society. By changing the variable from binary to a five-scale variable, could the variance of the answers and nuances of the student's assessment towards trust in society be captured. This question also aims to answer the hypothesis that individuals that trust other are also more honest.

Georgia, being the second most religious country in Europe (Pew Research Center, 2018), I decided to add three different religion question to capture the degree of religiousness. Since being religious can affect honesty (Arbel et al., 2014; Bar-El and Tobol, 2017). The problem, both with Bar-El and Tobol (2017) and Arbel et al. (2014) is that they used a single question to measure religiousness. The self-assessed religiousness different across societies and has a

¹⁰ Some students during the feedback session, indicated that there is a social stigma in Georgia that is associated with coming from a village and therefore students would not admit that they would come from a village. Though this notion is not present in the sample, as almost half of the individuals respondet coming from a village.

unique historical and cultural context. In Georgia religion part of the national identity of being a Georgian (Pew Research Center, 2018) and secondly, being religious does mean different things in different countries. These question tries to capture the nuances in religiousness.

There is evidence that moral firmness can increase honesty (Shalvi and Leiser, 2013) therefore the last question (number 11) was added; *Please indicate whether you think it can always be justified, never be justified, or something in between, to avoid a fare on public transport.* This question comes from World Value Survey (Inglehart et al., 2014). Though this is a question individual's might not answers truthfully, this can give some information towards the individuals moral firmness.

In order for the questionnaire not to influence the reporting of the die outcome, the questionnaire was in an A4 sized envelope. During the sessions no participant opened the questionnaire before filling in the introduction sheet. Though this was not explicitly forbidden, the oral introduction informed the subjects only to open the envelope after filling in the introduction sheet. Hence no participant did know what the questions were during the die-throw ¹¹.

Events during the experiment sessions

During the 12 sessions, there were two sessions in which one participant in each of the two sessions failed to follow the rule of not talking during the experiment, and these individuals were asked to leave the room without receiving any payment. In the middle of the experiment week on Wednesday evening, a student posted on the university Facebook group and informed other students, that she was part of an experiment and explained she had rolled a die and was asked to answer questions about religion. Luckily, she did not mention anything about the treatments, and the local researcher could get in contact with her to take down the post within 10 mins after posting. This type of occurrence would be less likely if the experiment were conducted on several locations at the same time, (as is practice in experiments). However, due to both budget constraints and lack of time to train and recruit local researchers that were willing to do the experiment for free, this option was not available.

¹¹ The experimenters didn't see any of the participants changed their outcome on the introduction sheet after the participants had filled out the questionnaire.

Theoretical framework

To understand dishonest behavior, this thesis relies on Mazar et al. (2008) theory of self-concept maintenance. These authors argue that individuals will not lie maximally even when there is an opportunity to cheat without repercussions. Individuals will lie a little such that their beliefs about themselves do not change. Therefore, an individual might act mendaciously without having any moral cost (i.e. feeling bad for a dishonest behavior).

People will act dishonestly within a certain limited framework, but not surpassing particular moral boundary. By cheating in a die throw experiment, where there is no chance of getting caught, individuals might cheat, but not the maximum amount (by reporting the number 5) since there is an upper limit to their own boundary and identity. With this experiment conducted in Tbilisi, participants have the chance to cheat. For example, a student receives a die throw of two which gives a monetary reward of 6 GEL; however, the student reports a four on the answer sheet and receives therefore 12 GEL. The student, therefore, forfeits the chance of receiving a highest payoff of 15 GEL. Mazar et al. (2008) argues that the reason why an individual would not cheat maximally consists of two mechanisms. First, the categorization, depending on the context a subject will act dishonestly without updating their self-image. For example, stealing a pen worth €0,10 from a friend is easier than stealing the same amount out of the friend's wallet, since stealing a pen is "what friends do". The later part, stealing 10 cents, is not allowed according to the individuals own category (or boundary), however within the context of "what friends do", stealing a pen (that is worth 10 cents) is within the context and the individual will not have to update their self-image, thus not "feeling bad" about stealing the pen. The context or category can be in itself adjustable, depending on how flexible the category is, the more room there is within a category to act mendacious, more of these acts are possible, without updating the self-image. The second mechanism is the subject's attention to their moral standards. Individuals that are aware of their moral standards will be thwarted from acting dishonestly. In this sense by reminding of their moral standards by adding an oath (honor code) or letting subjects write down the ten commandments can decrease the amount of lying. To confirm this mechanism, Mazar et al. (2008) conducted several experiments by letting students swear an oath or write down the ten commandments before doing a task. They find that by reminding these individuals on their moral standards, the level of honesty increases. The theory of self-concept maintenance; therefore, predict that individuals will not lie maximally (that is, all students will not report the number five) and will report slightly higher die-throws than the true outcome. The distribution of the reported die-outcomes is therefore expected to look like a staircase, with the lowest reported number being six.

Proximity to the experiment leader can be seen as the perception of being monitored. In this experiment, no individual will be monitored, however, by the proximity to the experiment leaders (sitting physical closer), the subjects might feel that they are being monitored, which would according to Rose-Ackerman (1975) increase the cost of lying. In Addition, Gneezy et al. (2018) discusses that there are three costs for lying, the distance of the lie in relation to the true outcome and what is reported; the cost of the reporting of the outcome might be preceived to be dishonest and lastly the cost of that is associated with monetary gains that is created by lying. Thus, one can argue that part of being monitored is due to the effect the agent can have the perception of observed and therefore to be preceived to be dishonest.

Description of the utility function of dishonesty

In order to describe and predict the agent's level of honesty the utility function from Beck et al. (2018) is borrowed. The model consists of two parts, the basic utility function for money and a moral cost function. The basic utility function for money depends on the monetary payoff with diminishing marginal returns of money¹², $U_i = \sqrt{p_i} + m\beta\sqrt{p_j}$. m denotes the number of other players who receives a payoff, β denotes the degree of how much an individual care about other individuals' payoff and p_j denotes the other players payoff. In this thesis, the agent's utility does not depend on other agent's, thus the term $m\beta\sqrt{p_i}$ is zero. Furthermore, p_i is the total monetary payoff for individual i , p_i consists out of two components $p_i = r_i + L_i$, r_i which is the true outcome of the die roll, and L_i , which is the possibility to lie to oneself. This can be argued to be part of the self -concept maintenance, where agents lie only a little to them self. For example, if the actual outcome was $r_i=2$ (6 GEL), and an agent lies a little and adds $L_i=1$ (3 GEL), resulting in a payoff of 9 GEL. What prevents the individual from lying maximally, in this example add $L_i = 3$, such that total payoff would be 5 (the maximum amount), is the cost of lying, C_i . This part of the utility function consists of the following elements; $\delta_{i,j}$, the preference for lying and L_i , which is the amount of lying. The cost of lying can increaser with $a \geq 1$, by signed an oath (moral awareness) alpha becomes bigger than one. The subscript j in the small delta indicates where in the room the agents is (front or back). Combining these elements yields: $C_i = a(\delta_{i,j}L_i)$ ¹³.

By adding all the elements into one expression, the utility function looks the following:

¹² Diminishing marginal return of money is a assumption better fitted with a larger intervall than used in this thesis, however, due to time contrains this model is not expanded to linjeat marginal returns. See for example Dufwenberg and Dufwenberg (2018) where linear marginal returns of money is used.

¹³ By removing the variables m, β, δ_j, L_j and, the moral costs and utility functions remains same as Beck.et al. (2018) for their baseline and moral awareness treatment.

$$U_i = \sqrt{(r_i + L_i)} - a(\delta_{i,j}L_i).$$

In the same manner, as Beck et al. (2018) the optimum lying, for both the baseline and the oath treatment, are derived by taking the first derivative w.r.t. L_i and set the equation to zero and solve for L_i we get: $L_i = \left(\frac{1}{2\delta_{i,j}}\right)^2 - r_i$, for the baseline and $L_i = \left(\frac{1}{2a\delta_{i,j}}\right)^2 - r_i$ for the oath treatment, $a = 1$ and is therefore not in the baseline equation. This highlight the expected difference in cheating for both groups. As the variable, a takes a positive number bigger than one, the amount of lying decreases, ceteris paribus. By increasing the commitment of the agent to report honest answers, the amount of lying is expected to decrease, ceteris paribus. Thus, the utility for cheating, depends on the monetary payoff, how much an agent lies, whether or not signing an oath, the preference for lying. The mechanism for individuals perceived of being monitored lies within the preference for lying (subscript j). As explained in the experimental design part, the subjects are randomly assigned a seat during each session, either in the front-half or in the back-half of the classroom. Hence, the preference for lying, small delta, will change in depending on the seating within the room. Since the subjects are randomly assign to their seats the probability of having a higher $\delta_{i,j}$ is the same for both groups. On average the small delta's ought to be the same between the baseline and oath treatment; therefore the only difference is having signed the oath.

This model leads to the expected intuitive conjectures mentioned in the introduction.

Conjecture 1: I expect the amount of lying to be lower in the oath treatment than in the baseline. The cost of lying is expected to increase for the subjects signing the oath, and therefore I expect those individuals to report, on average, lower die-outcomes.

Conjecture 2: I expect the amount of lying to be the same for students sitting in the front-half of the classrooms compared to those sitting in the back half of the classroom. That is, if the oath is strong enough, the perception of being monitored should not make a difference in the reporting of outcomes. Individuals sitting in the back half should on average report the same die-outcomes, compared to those sitting in the front of the classroom, in each respective group.

Data and statistical tests

Descriptive statistics

In table 1 the descriptive statistics from the sample are presented. The sample consists of 136 individuals. Majority of participants had only one or no friends present during the sessions, and 56% reported coming from a village. The proportion that answered coming from the middle class is 54% (compared to 27% in Georgia, Inglehart et al., 2014). The samples consist of 75% females, and students coming from the faculty of arts and sciences make out 72%, whereas 21% came from the faculty of Business, Technology and Education, which includes economics students. The mean session size was 12.6 (SE. 0,346) students over 12 sessions. The average payoff for each student was 8,8 GEL (SE. 0,45) and for Baseline and Oath treatments 9,04 GEL (SE. 0,62) respectively 8,5 GEL (SE. 0,64). For comparison, the theoretical mean is 7.5 GEL. As expected, 78% of the participants consider themselves being religious (compared to 97% in the entire population, Inglehart et al., 2014). The samples have an over-representation of female students as 51% of women in population are enrolled in a public university in Georgia ("Higher Education - National Statistics Office of Georgia", 2019).

Statistical tests

To answer the conjectures this thesis uses three main tests. Mann-Whitney test also known as Wilcoxon rank-sum test. As this is a non-parametric test which does not assume a distribution, thus this test is well suited for a uniform distribution. Mann-Whitney test for a random selected value from one sample is larger or equal to the value of another sample. For example, testing whether the value for the baseline is different from the oath treatment. Binominal test is used for testing the outcomes of the reported outcomes, one through six. This test tests the likelihood of an event happening under an expected outcome. If individuals would be honest the expected outcome is 1/6 for any reported number. However, this expected outcome is in an infinite sample of throwing a fair die one time, repeating infinite times. For example, the probability of the subjects reporting 50% of number five is very unlikely and the binomial test tests this. To determine whether or not the outcomes of for example, reported fives, are different in the oath treatment and the baseline a Fisher's exact test is used. Compared to Chi2 test, the Fischer's exact test is suitable for small sample sizes, which is better suited for this thesis, as the samples get smaller when comparing outcomes of reported numbers. These mentioned tests are common in the previous experiments cited in the literature review as well. In addition to these tests, a simple t-test is used as an intuitive guide, as t-test are easy to interpret, even though the t-test assumes normal distribution.

Table 1 Descriptive statistics

Variable	Frequency	Percent	Variable	Frequency	Percent
Female			Income Group²		
Female	102	75%	Below middle class	30	22%
Male	34	25%	Middle class	73	54%
Age			Above middle class	33	24%
17-21 years	98	72%	Trust people³		
22 and older	38	28%	Can be trusted	48	35%
Friends during session			Must be careful	88	65%
Zero	38	28%	Importance of religion		
One	36	26%	Very/rather Important	104	76%
Two and more	62	46%	Not very/Not Important	32	24%
Mean	3,4		Attending religious services⁴		
SE.	0,41		Once a week and more	45	33%
City			At least once a month	52	38%
From a city	60	44%	Occasionally	39	29%
From a village	76	56%	Religiousness⁵		
Faculty¹			Religious	104	78%
Arts and Sciences	96	71%	Not Religious	30	22%
Other	40	29%	Not paying for public transportation⁶		
			Never justifiable	118	88%
			Always justifiable	16	12%

Note: ¹Other includes Business, Technology and Education and Natural Sciences and Medicine. ² Respondents that indicated belonging in the income group below 5 is classified below middle class, and respondents above 6 as above middle class. ³ Respondents that indicated on the scale 4 or 5 are classified as 'must be careful' otherwise as 'Can be trusted'. ⁴Merged answer alternatives, occasionally includes, 'Only on special religious holidays', 'Less often' and 'Never'. ⁵None of the responded indicated to be an atheist. ⁶On the scale of 10, below and equal 5 is 'Never justifiable' and above 5 'Always justifiable'.

Results

Below are the results from the experiment. First are the results to evaluate each conjecture and then an OLS regression is presented. Each figure is accompanied with a binominal test table.

Conjecture 1: I expect the amount of lying to be lower in the oath treatment than in the baseline.

In figure 1 the sample is divided into the respective group, baseline and oath treatment. The outcomes are in monetary terms. 3 GEL equals the die-outcome of number 1, and 15 GEL the die-outcome of '5', whereas 0 GEL is the die-outcome of '6'. The line across is the expected uniform distribution of one die roll, since the random chance of getting any of the six outcomes is $1/6=16,67\%$. If all individuals were honest, there would be as many ones as sixes; therefore, this line indicates total honesty, though this is only the hypothetical benchmark in an infinite sample. Each sample randomly drawn from the population will show different outcomes, though the underlying distribution will be the same. In figure 1 both distributions are shown and there seems to be a difference between these groups. The amount of 5's (15 GEL) is significantly different from $1/6$ (in a double-sided binominal test, $p=0,002$) for both groups. Furthermore, in the baseline group, the frequency of the reported number '6' (0 GEL) is lower than $1/6$, significant on the 10 % level. Whereas in the oath treatment the number of reported 1's is significantly less than $1/6$ significant on the 10% level ($p= 0.101$), in a one-sided binomial test. This indicates that some individuals in the baseline group were dishonest since the reporting of number 1's is lower than the expected honesty benchmark of 16,67%. This is not shown in the oath treatment; the number of reported '1' is within the range of 16,67% ($p=0,193$, double-sided). In both groups, there is an indication of dishonest behavior, overreporting of number '5' is high in both groups, though the oath treatment has lower significance for the '5' at 10% ($p=0,073$, double-sided). Interestingly the reported 0 GEL in the baseline sample is significantly smaller on 10% level ($p= 0.101$) in a one-sided binomial test, whereas 3 GEL is significantly smaller in the oath treatment ($p=0,101$).

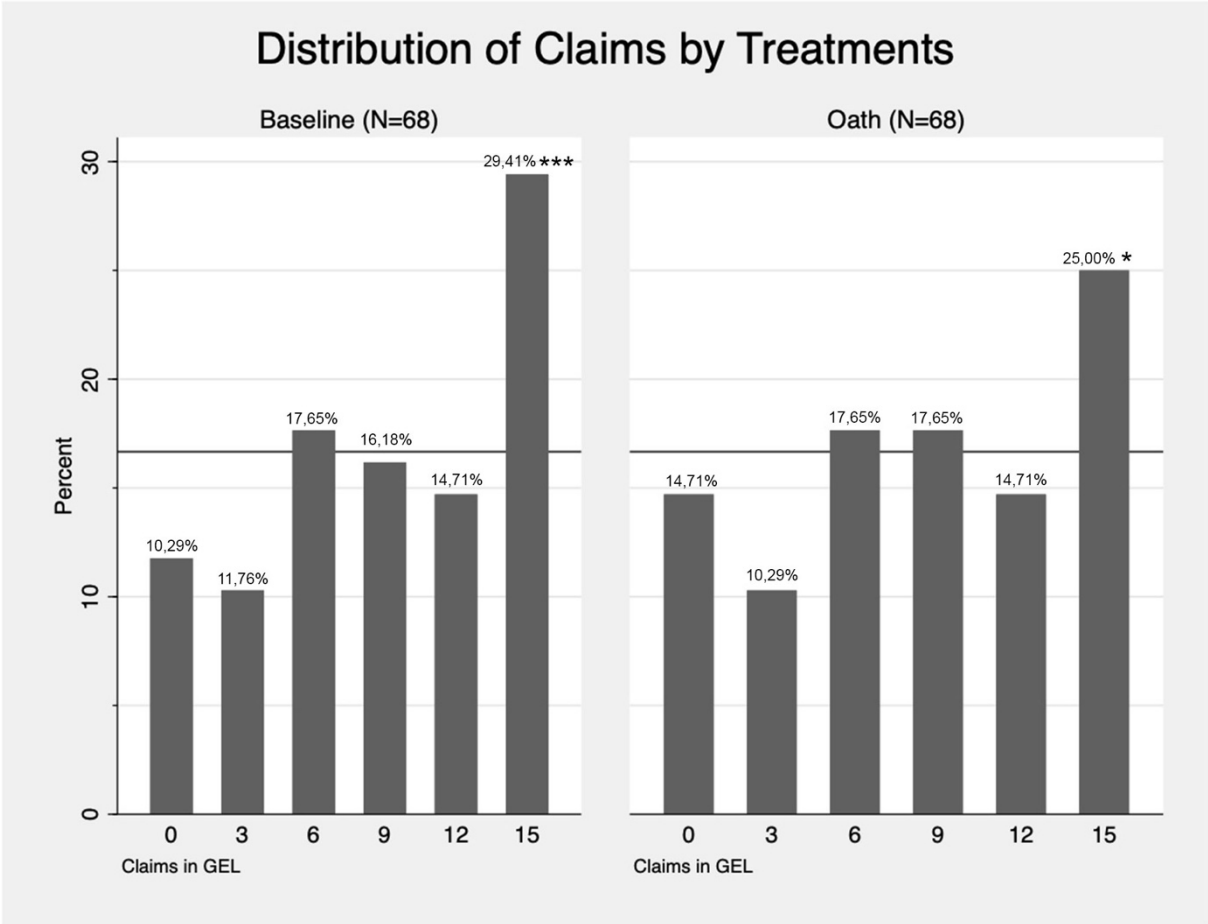
The non-parametric Mann-Whitney test fails to reject the hypothesis, that the distribution of these two samples are equal ($p=0,529$), hence I find no statistically significant difference between those two samples¹⁴. Comparing the baseline with Gächter and Schulz (2016) experiment in Tbilisi shows no significant difference in distributions (Mann-Whitney test,

¹⁴ A chi2-test shows the similar signs, no difference between oath treatment and baseline $p=0,971$.

$p=0,166$). The means for reported payoffs for baseline is 9 GEL (SE. 0,624) and for oath is 8,5 GEL (SE. 0,638), and simple t-test shows no difference between the means ($p=0,52$).

In table 2 the changed from moving from the baseline to the oath treatment is shown. Interestingly the amount of reported 6's (0 GEL) increased by 43%, which would indicate that the oath affected the amount of honest individual; however, a Fisher's exact test reveals that the variation between those groups is within each other's span ($p=0,3$ double-sided). One would expect an increase in the number of reported 6's in the oath treatment. Showing a similar sign is the amount of lower reporting of the 15 GEL outcomes, which is 15% lower in the oath than in the baseline. Fischer's exact test shows that the frequencies are within range of each other ($p=0,35$, one-sided). This result gives some hints towards the effect of the oath; however, the results are not conclusive.

Figure 1 Distribution of claims by Baseline and Oath



Note: Stars indicate double-sided binominal test. *=10%, **=5% and ***=1% significance level.

Table 2 Comparing Baseline and Oath treatment

<i>Claim in GEL</i>	<i>Baseline</i>		<i>Oath</i>		Difference from Baseline to Oath in %
	Frequency	Percent	Frequency	Percent	
0	7	10,3%	10	14,7%	42,7%
3	8	11,8%	7	10,3%	-12,7%
6	12	17,7%	12	17,7%	0,0%
9	11	16,2%	12	17,7%	9,3%
12	10	14,7%	10	14,7%	0,0%
15	20	29,4%	17	25,0%	-15,0%

Table 3 Binominal test for figure 1

<i>Claim in GEL</i>	<i>Baseline</i>	<i>Oath</i>
0	0,193 (0,101)	0,747 (0,406)
3	0,331 (0,179)	0,192 (0,101)
6	0,870 (0,464)	0,870 (0,464)
9	1,00 (0,536)	0,870 (0,464)
12	0,747 (0,406)	0,747 (0,406)
15	0,008 *** (0,006***)	0,073* (0,052*)

Note: P-values for double-sided binominal test if reported outcome is different than 1/6. In parentheses one-sided if frequency is below or above 1/6. *=10%, **=5% and ***=1% significance level.

Conjecture 2: I expect the amount of lying to be the same for students sitting in the front-half of the classrooms compared to those sitting in the back half of the classroom

In figure 2, the sample is divided into four groups, those individuals who sat in the front-half of the classroom and those in the back-half in the back and split into oath treatment and baseline. By looking at the distributions, there seems to be a contrast between front half and back half of the classroom. In the former, the frequencies of the different outcomes are not different than 1/6 in both oath and baseline group. In the two back-half samples, 15 GEL is significant different from 1/6 on the 5% (p=0,014, double sided binominal test) for baseline and 5% (p=0,021, double-sided binominal test) for the oath treatment. The amount of reported one (3 GEL) in both baseline and oath in the back half significantly lower than 1/6 on the 10% level (p=0,08 for baseline and for oath p=0,107, one-sided binominal test). Interestingly in the back half baseline the reported three (9 GEL) is significantly lower than 1/6 on 10% level (p=0,08, one-sided binominal test).

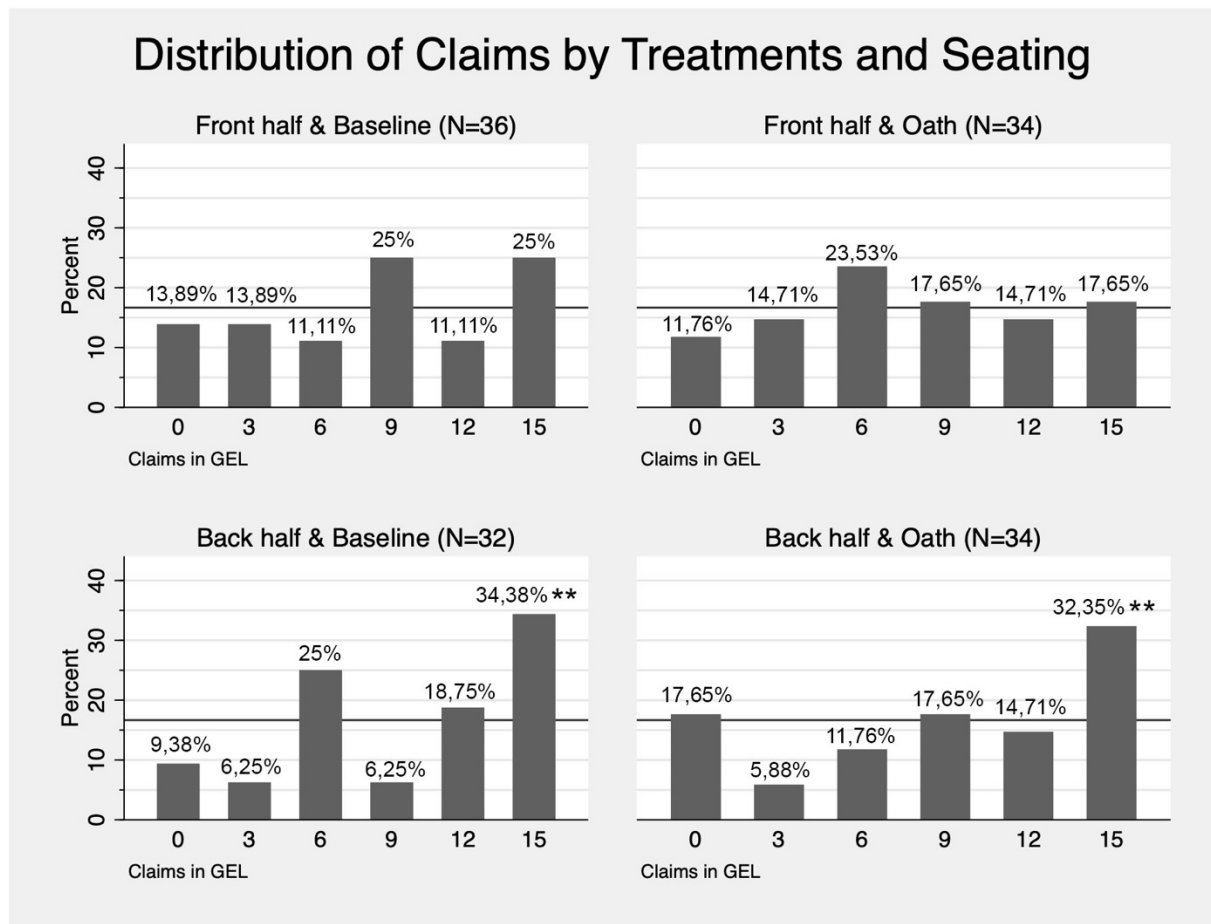
Whether there is a different between the oath group front half and back half, the double-sided Mann-Whitney test finds no difference between the front half and back half (p=0,275). For the baseline, the same test gives the p-value of 0,357. Thus, both tests fail to give statistical evidence that seating matters for the reporting of the outcome, as there seems

to be no difference between sitting in the front-half versus sitting in the back-half. By looking whether or not there is a difference in the frequency of reported 15 GEL, Fischer's exact test for the oath treatment shows that these frequencies are not different from each other ($p=0,262$, double-sided) between those individuals sitting front half or back half of the classroom. For the Baseline, the frequencies of 15 GEL between front half and back half is neither different ($p=0,435$, double-sided). T-test shows similar signs in the oath group between front half and back half $p=0,337$ and for the baseline group $p=0,359$.

By combining the baseline and oath treatment to show an average effect of the seating within a classroom gives a similar picture as the results above (see figure 3 in appendix). In table 6 (see appendix) the differences between the two halves of the classrooms are shown. On average the reporting of number 15 GEL decreases with 35,7% when moving to the front half of the classroom from the back half, reporting of 0 GEL decreases with 16,2% and reporting of 3 GEL increases with 157,4% when moving from the back-half to the front-half of the classroom.

These results indicate that sitting closer to the experiment leader have an influence, as the reported 15 GEL is significant different for both oath and baseline in the back-half group. Though there is no statistically difference in the distributions, which can be explained by the small sample size, as each group consist approximately of 30 individuals. Though, interestingly the group oath front half looks as if the oath worked. Hence, I fail to confirm the conjecture that there is no difference between the individuals reporting when sitting in the front half or back half. Thus, the oath is not strong enough to mitigate the perception of being monitored.

Figure 2 Distribution of claims by baseline, oath, front half and back half.



Note: Stars indicate double-sided binominal test. *=10%, **=5% and ***=1% significance level.

Table 4 Binominal tests for figure 2

Claim in GEL	Front half		Back half	
	Baseline	Oath	Baseline	Oath
0	0,824 (0,431)	0,644 (0,309)	0,347 (0,196)	0,812 (0,510)
3	0,824 (0,431)	1,00 (0,490)	0,153 (0,08*)	0,107 (0,061*)
6	0,503 (0,261)	0,256 (0,195)	0,231 (0,152)	0,644 (0,309)
9	0,180 (0,133)	0,819 (0,510)	0,153 (0,08*)	0,819 (0,510)
12	0,503 (0,261)	1,00 (0,691)	0,811 (0,447)	1,00 (0,490)
15	0,180 (0,133)	0,819 (0,510)	0,014*** (0,012***)	0,021** (0,0187**)

Note: P-values for double-sided binominal test if reported outcome is different than 1/6. In parentheses one-sided if frequency is below or above 1/6. *=10%, **=5% and ***=1% significance level.

Regressions

In table 5, five OLS regression were conducted to control the social-economic variables on the reporting of the die-throw. The independent variable is the reported die-outcome¹⁵. As seen by the OLS-regression 1, treatment did not affect the reporting of the die outcome (treatment equals one if a student belongs to oath treatment). Regression 2 controls for gender, city (social anonymity), friends, trust and religiousness¹⁶. Interestingly only friends seem to influence the reporting of die outcome, however, though the effect is very small. To achieve one increase in reported die-outcome a student has to have at least 14 friends during a session (which would be above the average size of the experiment session). Friends is significant only for the baseline group; the effect vanishes with the oath treatment and the full regression 5. Regression 5 controls for perceived monitoring and controls for sitting in the front half affects the reporting of the die-outcome. Sitting in the front half of the classroom seems not to affect the reporting of the die outcome in regression 5, and the interaction term (Treatment*Front-half) seems not to indicate that being in the oath treatment and sitting in the front half of the classroom affect the reporting of the die-outcome.

Table 5 OLS-Regressions

VARIABLES	(1) Full Sample Die outcome	(2) Full Sample Die outcome	(3) Only Baseline Die outcome	(4) Only Oath Die outcome	(5) Full Sample Die outcome
Oath treatment	-0.191 (0.297)	-0.171 (0.302)			-0.129 (0.442)
Front-half (dummy)					-0.352 (0.435)
Treatment * Front-half					-0.112 (0.632)
Female (dummy)		-0.050 (0.360)	-0.190 (0.496)	0.075 (0.536)	-0.104 (0.358)
City (dummy)		0.332 (0.303)	0.182 (0.424)	0.557 (0.454)	0.362 (0.307)
Friends (integer)		0.069** (0.032)	0.076* (0.045)	0.058 (0.048)	0.068 (0.032)
Trust people (dummy)		0.150 (0.316)	-0.057 (0.444)	0.327 (0.482)	0.107 (0.314)
Religiousness (dummy)		0.159 (0.336)	-0.198 (0.469)	0.621 (0.478)	0.110 (0.337)
Constant	3.015*** (0.208)	2.472*** (0.472)	2.966*** (0.606)	1.716*** (0.584)	2.743*** (0.549)
Observations	136	134	68	66	136
R-squared	0.003	0.048	0.049	0.067	0.062

Note: Robust standard errors in parentheses and * = 10%, ** = 5% and *** = 1% significance level.

¹⁵ Die outcome 6 is coded to 0.

¹⁶ I intentionally left out controls for moral firmness, question 11, because it did not change the regressions and was highly insignificant.

Discussion

How can these results be interpreted? According to the theory of self-concept maintenance and other experiments conducted before (Fischbacher and Föllmi-Huesi; Gächter and Schulz; Bar-El and Tobol, 2017; Beck et al., 2018), I expected to see a staircase pattern and “incomplete lying”. The experiment shows only little evidence in the oath treatment, where number one is only slightly significant on the 10% level. Which is contradictory, if the oath worked, it would increase the cost of lying, and there would be no difference in reporting of ones (or any other number). I would expect to see a similar result as Beck et al. (2018). Though in my experiment, the significance of the reported 5's is different, in the baseline on 1% and in the oath treatment on 10% level, which gives some hint towards the effect on this particular oath on reporting of the die-outcomes. When moving from the baseline to the oath treatment to the amount of reported 5's (15 GEL) decreases with 15% gives additional hints that the oath might work. As theory would suggest, the cost of lying would increase in the oath treatment (Mazar et al., 2008). Compared with Beck et al. (2018), their oath treatment indicated that some individuals might have lied (Kolmogorov-Smirnov test showed non-uniform distribution), which indicates that my results are in line with previous research.

The effect of an oath should, according to Kiesler (1971), increase the commitment to a particular behavior and thus increase the moral cost of lying. The result shown in this thesis, indicates that the oath increases the cost of lying, though one can argue the signing an oath with a signature versus tick a box is a different act, thus the subject's commitment to the oath might differ. This can indicate that in order to increase the cost of lying an oath has to be signed as Jacquemet et al. (2013). Though Carlsson et al. (2013) find evidence that an oath script (ticking in a box to promise to answer truthfully) increase the commitment and the answers were more sincere. Mazar et al. (2008) points to the effect of a moral reminder that would decrease the amount of lying. That is, participants would lie less when being reminder on the moral code (oath), this, however, would not explain why in this experiment the distribution of the lower outcomes is almost equal to each other.

If the oath would be strong enough, there would be no difference between front-half and back-half in the oath treatment, which is not the case here. It seems that the perception of monitoring (physical distance towards the experiment leader) affects the level of honesty, though the distributions are not significantly different from each other (sitting in the front-half versus back-half of the classroom within each group). Though neither the reported of number five (15 GEL) is significant different from 1/6 in the front-half for the baseline nor in the oath treatment, where 15 GEL is significantly different in the back-half for both groups. Hence, there is some evidence that perception of being monitored affects the reporting of the die-outcome. Thus, there is evidence the perception of being observed by

the experiment leader increased the cost of lying. By sitting in the front-half of the classroom, the perceived monitoring would increase as theory and previous literature would suggest (Rose-Ackerman, 1975; Kroher and Wolrbing, 2015). Though the regression does not give a clear picture that this is the case, there might be just random chance in rolling the die for those individuals sitting in the front-half of the classroom (they might just have the chance of rolling lower outcomes). Additionally, there might be a different effect depending on the context and what type of authority is monitoring the participants, for example, there might be a stronger effect on honesty if a police officer monitors the classroom, than an experiment leader.

Compared to other similar experiments, which were conducted in a lab and usually after another experiment, sitting in a classroom, where the perception of anonymity might differ, could have compelled individuals to report more honest answers. The level of religious individuals in this samples is 78% which is lower than in the entire population of 97% (Inglehart et al., 2014), still this could impact the high level of honest reporting, as previous studies would suggest (Bar-El and Tobol, 2017; Shalvi and Leiser, 2013). The results that showed from the regression might not be reliable, since the sample size is small, and the overrepresentation of religious individuals gives little variance for the OLS to pick up the differences in religiousness. Gender might have influenced the overall reporting, though studies have not found any significant difference in individual reporting between genders (Muehlheusser et al., 2015; Arbel et al., 2014). An additional factor that could have influenced the die-reporting in this experiment is that under the influence of a foreign experiment leader in the classroom, some native Georgian students, might have chose to lie less, because these students might want to show a better behavior as a reflection of Georgia's national characte and thus report honest answers. Therefore, the outcomes of the experiment could have been different, if the entire experiment team was local, i.e. Georgian. Though, in Gächter and Schulz (2015), one foreign researcher was always in the room, similar to my experiment, and they received similar results (no significant difference between their sample and the baseline sample, Mann-Whitney test $p=0,166$).

These results presented in this thesis, shows that within a limited framework, individuals' economic decision in the context of a moral choice (cheating) is complex. The external forces (perception of being monitored) influence the decision making as well as the internal force (being honest, moral awareness). The material gain is thus weighted against the moral cost. In this sense, when making policy decision that seeks to diminish the instances of plagiarism in educational institutions, it's important not only to appeal to the inner human sense of "doing right" but also the external forces such as monitoring and punishments. Though a policy aimed at the inner forces (moral awareness) can increase the adherence to rules as this and previous studies have shown.

To address the perception of being monitored (distance towards the experiment leader) on honesty, further research is needed to understand how an experiment leader influences the reporting of answers, by using different distances and layouts within an experiment session. Using oath script in a developing country in a die-experiment has not yet been done until this thesis (as far as I am aware), to expand this knowledge, specifically how different type of oaths affect the reporting in combination with different types of punishment, is a possible future research avenue of this project.

Conclusion

By letting 136 students at the Ilia State University in Tbilisi do the die-in-a-cup-experiment, I found evidence of some lying and determined that the oath treatment had a small effect, the oath treatment decreased the reporting of the highest outcomes (15 GEL) with 15%, though there were no statistically significant differences between the baseline and the oath treatment. Sitting in the front-half of the classroom affects honesty, as no single reported die-outcome was significantly different from 1/6 in the front-half on the classroom compared with sitting in the back half of the classroom, in the respective groups baseline and oath. On average sitting in front reduces the reporting of the highest outcome by 36%.

This thesis shows, that this particular oath, where the subject had to tick a box to take an oath, has little effect on honesty. Therefore, a different type of oath would be preferred to increase the commitment to reporting honestly. Though, this gives credibility to the plagiarism text that Ila State University uses, as it increases the amount of honest answers.

The results of this research can be applied to state institutions, where honest reporting is important, for instance reporting of taxable income. The direct application is within the university and high school sphere, where these results can have a more significant impact. For example, during an examination, the examiner might sit in the middle of the examination hall, such that the proximity to all students in a classroom is the same which would increase the perception of being monitored. This can also be applied within a standardized test centers (such as GRE-test centers), where the layout is such that the distance to the test leader is minimized and the perception of being monitored is conversely maximized. This could also be applied directly for admission tests such as the Swedish Scholastic Aptitude Test. The oath can be easily incorporated into questionnaires or in an exam, in order to slightly increase the commitment to honest answers.

Future research has to understand how the physical distance towards an experiment leader affects honesty of participants' reporting in developing countries and how the impact of different types of oaths, in addition to different types of punishments, affects honesty. For example, by informing subjects that if someone gets caught lying, no payment would be made for the entire session.

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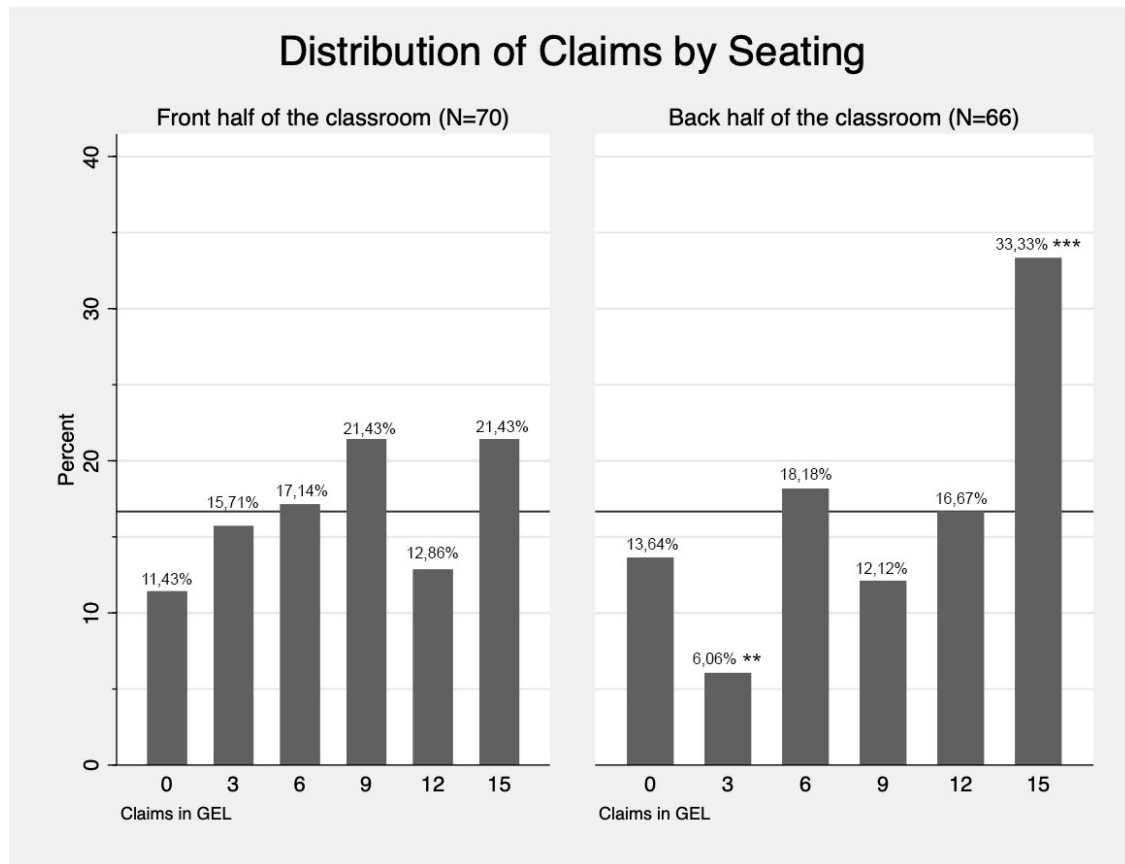
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Appendix

Figures and tables

Figure 3 Distribution of claims combining baseline and oath in front half and back half.



Note: Stars indicate double-sided binominal test. *=10%, **=5% and ***=1% significance level.

Table 6 Comparing back-half with front-half of the classroom

Claim in GEL	Back-half		Front-half		Difference from front-half to back-half in %
	Frequency	Percent	Frequency	Percent	
0	9	13,6%	8	11,4%	-16,2%
3	4	6,1%	11	15,7%	157,4%
6	12	18,2%	12	17,1%	-6,0%
9	11	16,2%	15	21,4%	32,1%
12	11	16,7%	10	12,9%	-22,8%
15	22	33,3%	15	21,4%	-35,7%


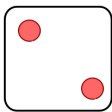
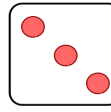
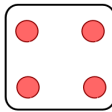
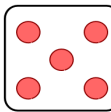
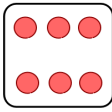
Instructions

Please keep quiet during the experiment. If you disobey this rule, you are asked to leave the classroom.

This experiment consists of two parts. First you are asked to roll a die once and report the outcome of the roll you get on the second page of this paper. In the second part you are asked to open the envelope and fill out the questionnaire.

For being part of the economic experiment, you receive a payment of 5 GEL. Additionally, you have chance of receive additional payment. The payoffs are determined on the basis of what you report. Please use the cup so the outcome will remain anonymous. Before you roll your die, you have to place the die in the cup. The cup has a hole on the bottom, through that hole you can see the outcome of your die roll, as shown by the researcher.

Please see the table below for an overview of the payoff structure.

Number Thrown						
Resulting payoff	3 GEL	6 GEL	9 GEL	12 GEL	15 GEL	0 GEL

Once you have thrown the die and written down your outcome fold this paper, open the envelop and fill out the questionnaire.

After you have filled out the questionnaire, put the cup with the bottom down with the die inside, in front of you. In this manner, we know that you are done with the experiment. Once everyone in the classroom is finished, the researcher will start calling up seat numbers. When your number is called, go with this paper and the filled-in questionnaire to the researchers and you will then get paid according to what you reported. Once you have received your payment, please leave the classroom quietly.

During the experiment please do not speak or signal your outcome to others. Your answers will remain anonymous. If you have any questions during the experiment, please raise your hand and the researcher will come to you and answer your question.

Good Luck.

Baseline and Oath Treatment

Baseline

Seat number: _____

Before you start rolling the die please indicate below that you have read and understood the instructions.

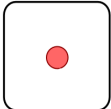
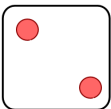
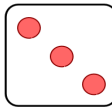
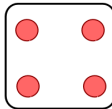
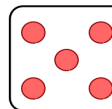
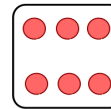
Yes, I have

No, I have not.

Please write down the number you have thrown and the resulting payoff.

Number thrown: _____

Resulting payoff: _____

Number Thrown						
Resulting payoff	3 GEL	6 GEL	9 GEL	12 GEL	15 GEL	0 GEL

Please write down your seat number in the upper right corner.

Once you are done with writing down your outcome, **fold this piece of paper** and open the envelope and start filling out the questionnaire.

Oath

Seat number: _____

Before you are rolling the die, please answer following statement:

I confirm that the document I submit to the research includes true answers, the provisions are indicated in the prescribed manner.

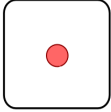
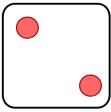
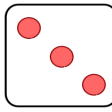
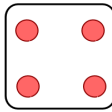
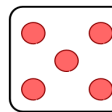
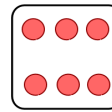
I confirm

I do not confirm

Please write down the number you have thrown and the resulting payoff.

Number thrown: _____

Resulting payoff: _____

Number Thrown						
Resulting payoff	3 GEL	6 GEL	9 GEL	12 GEL	15 GEL	0 GEL

Please write down your seat number in the upper right corner.

Once you are done with writing down your outcome, **fold this piece of paper** and open the envelope and start filling out the questionnaire.

Questionnaire

Questionnaire

Seat number: _____

1. Please indicate your gender:

Male Female

2. Please indicate your age:

17 - 21 years 22 – 25 years 26 years and older

3. Where are you from?

From a city From a village

4. Which faculty do you study at?

- Faculty of Arts and Sciences
- Faculty of Business, Technology and Education
- School of Law
- Faculty of Natural Sciences and Medicine

5. On an income scale on which 1 indicates the lowest income group and 10 the highest group in Georgia, we would like to know what group your family's household is. Please specify the appropriate number, accounting all wages, salaries, and other incomes that come in:

Lowest group Highest group

1 2 3 4 5 6 7 8 9 10

6. During the session, approximately how many in the classroom would you say were your friends?

Number of friends: _____

7. Generally speaking, on a scale from 1 to 5, would you say most people can be trusted or you need to be very careful in dealing with people. Please specify the appropriate number.

Most people can be trusted Need to be very careful

1 2 3 4 5

Experiment manuscript

The set up

Classroom with separated seats. For every seat where the experiment is conducted, there is one seat free on the right or left side (if there is no wall). The seats in front and back are after each other, since the participants can't see through their neighbors back.

The classroom is empty of students and on each seat, there will be a cup with a hole on the bottom, a die and a pencil. Additionally, each seat there is a number, from 1 to 30 (1-20 or 1-28, depending on the size of the classroom in where the experiment is conducted).

Each experimentalist has a sign on them with the following text: [NAME] Invited researcher at Ilia State University.

The classroom is locked such that no student will come in and the participants will be first let in once the experiment leader opens the door. The students know via the teacher that in this class there will be an experiment conducted and that if they do not want to participate, they can wait outside, and the class will start 30 minutes after regular scheduled time. Outside the classroom door there is a sign, showing please be quite lecture is going on.

At the teacher's desk, there are two chairs for P1 and P2, a box with pre-filled money envelopes according to the payoff structure of the experiment, an empty box for the filled-in instructions, a dedicated spot for the questionnaire envelopes and a computer with an open excel document. The excel document has the classroom layout with the seat numbers.

Roles and actors

Person 1 (P1): Experiment leader and researcher. Holding in the experiment and giving the instructions in the local language.

Person 2 (P2): Researcher and assisting person 1 by handing out the questionnaires and holding the satchel with seat numbers. P2 also conduct the payout of the experiment and notes on the excel sheet where the students sit.

Conducting the experiment

Person 1

(P1 Opens the door to the classroom where the participants are waiting outside. P2 holds a satchel filled with small notes with a number between 1-30)

Hello, please come in and take a number out of this bag and find the seat according to your number you just took. This number is your identification number during your experiment, please keep it during the experiment.

(P1 has a welcoming gesture and is indicating to the satchel that P2 is holding)

(The participants are finding their seats and sits down. P1 and P2 are waiting for everyone to sit down, upon everyone sitting down the classroom. P2 locks the door and hangs a sign hanged outside the classroom door, indicating do not disturb, lecture is being held. P2 then sits down behind the teacher's desk and start noting on the excel sheet on which seat students sit)

(P1 goes in front of the class room and starts presenting the experiment)

Hello, my name is Rusudani Kochiashvili and I am an invited researcher at Ilia State University and this is my colleague Mr. David Schönfelder.

We are very thankful that you participate in our economic experiment. For participating you will receive a payment of 5 Lari, during the experiment you will have a chance to receive additional payment.

Before we start, I will give you the instructions how the experiment is conducted.

After I finish you giving the instructions, you will receive the envelopes with questionnaires and instructions. You are starting your experiment with carefully reading of instructions

(P1 is showing the instructions to the participants, with the instructions on each side)

Before we start the experiment, I will show you how to roll the die. You take the cup and die like this.

(P1 now picks up the die and the cup and shakes it and put the cup with the hole up, in such a manner that the die is under the cup)

You shake the cup and via the hole in the bottom of the cup, you can see outcome of your die-roll. On the second page on the instructions you write the outcome of your roll and the resulting payment, as well as number of your seat on the top right corner of second page. Then you fold this paper, open the envelope with questionnaires can then start to answer the questions.

Once you are done filling out the questionnaire you take the cup with the die and shake it and put it in front of you, like this.

(P1 slides the cup down the end of her table, in such a manner that no one can see the die, and takes the cup and put it with the bottom down in front of P1)

In this way, we know that you are done with the experiment.

When you are done, please stay quiet and wait for everyone to be finished. Once everyone is finished, we will start calling out the numbers of the seats. When your number is called out, please come forward to the desk with your filled-in paper and questionnaire. You put envelope at the table and give folded paper to David. You then will receive the payment according to what you reported. When you have received your payment, please leave quietly the classroom. You can leave your belongings here and come back once the lecturer starts teaching.

During the experiment you are not allowed to talk or communicate in any way with the other participants. You do not talk to the other participants and do not tell them your answers. Your answers will remain anonymous. Do not use your phones during the experiment. If you disobey these rules, you are kindly asked to leave the classroom. If have any questions during the experiment, please raise your hands and I will come and answer your question.

(Written on the whiteboard behind P1 are the email-addresses of the experimenters)

Here is also our email address, if you have any additional questions, feel free to write to us.

Just before I will give you instruction paper and questionnaire, we will do a practice die roll together.

(P1 now picks up the die and the cup and shakes it and put the cup on the table with the hole up, in such a manner that the die is under the cup and P1 sees the outcome of the roll, every student follows the procedure)

We will now handout the instructions and questionnaires, please wait until everyone has receive the questionnaires.

Thank you very much again for participating in this experiment.

(After the instructions are given, P1 and P2 hand out the questionnaires. P1 starts with the most left seat and continues handing out the questionnaires on her right side until she comes all the way down and then she turns on continues up back towards the front of the classroom and handing out the questionnaires to the chairs on the right. David does the same but opposite, on his right side)

(P1 and P2 stands in the front of the classroom)

Now everyone has the questionnaires, you may start the experiment.

(Whiles the participants are doing the experiment, P1 and P2 sits behind the teacher's desk and observes the classroom. Once everyone has put their cup in front of them, P1 starts calling out the numbers of the seats at random)

Now when everyone is done, I will start calling out the numbers and when your number is called please come forward. Number 4 [from 1 to 30]

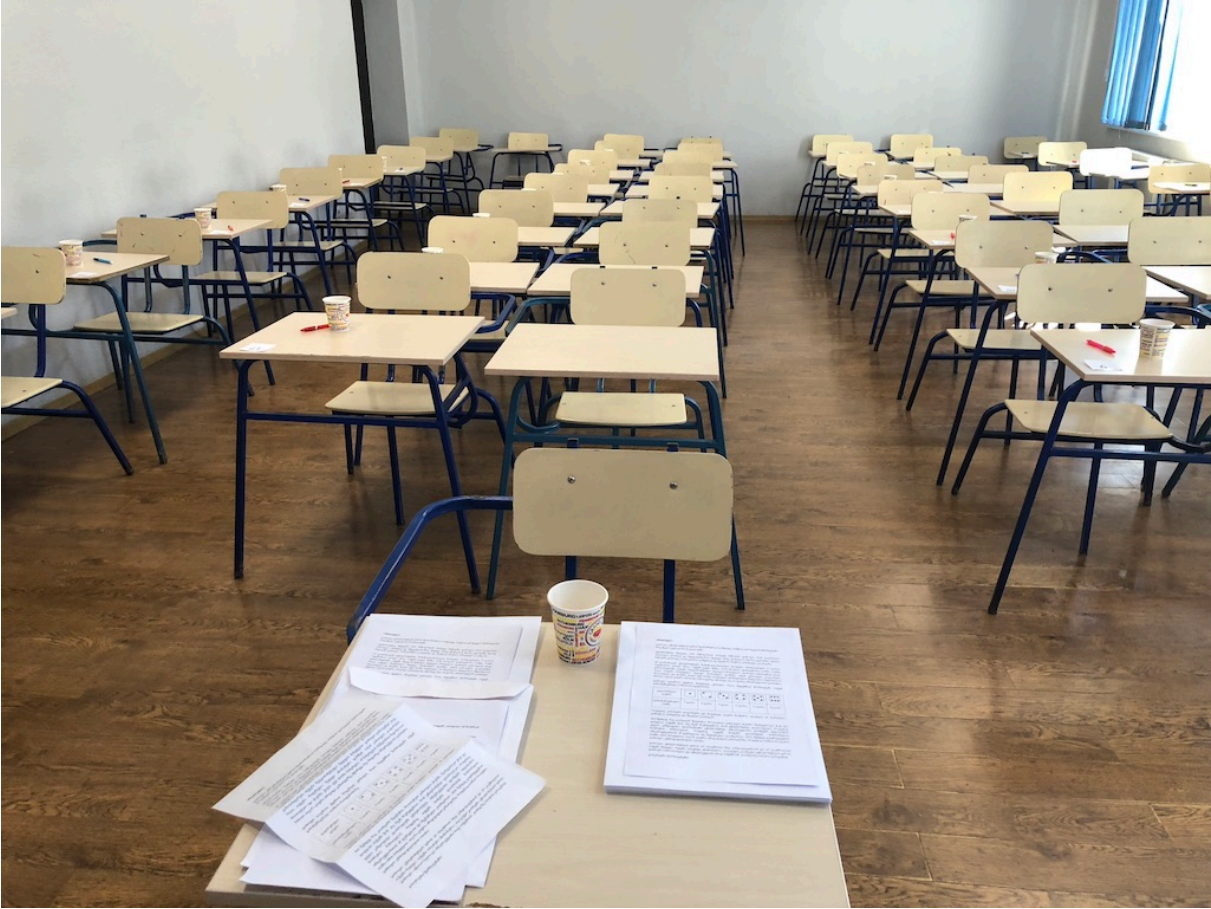
(The participant with a number comes in front of the teaches desk and gives the instructions to P2 and the envelope on the pile for envelopes. P2 then reads the outcome of the instructions and put in in the box for filled-in instructions. P2 then reaches in the already prepared box with envelopes and hands the envelope over to the participant. Upon which the participant leaves the room as instructed. After the participant left the teachers desk, P1 will call out another number and repeat the same procedure until every participant has received their payment).

(Once all the participants have left the classroom, P1 and P2 collect the mugs and their belongings and go out of the classroom to thank for participating and waits outside for any questions).

(The teacher will let the students back in and start the lecture)

[END OF THE EXPERIMENT]

Classroom set up and cup



Data entry

When transferring the answers from the questionnaire and instruction sheet to the data set, the following rules were used. There were several cases in which the students didn't fill in the amount of GEL that the die throw corresponds to, these were filled in afterwards. If during a session, students would break the rules or didn't want to receive a payment, which happened on three occasions (two individuals breaking the rules and one individual didn't want to receive any payment), these answers were not registered in the data set, other than the in what session rule-breaking happened. On one questionnaire, the question number seven had two different answers, the highest answer was registered. Since this question is later transformed to a binary variable, were the answers 4 and 5 is coded to zero and 1-3 to a one. If no answer was written for a question in the questionnaire, it was coded as missing value. During the entry of the data, there was not a single instruction sheet where a participant had changed outcome of the die-roll or written a different outcome than the die corresponds to in GEL.