Generosity, Anonymity, and Religiosity: A Dictator Game Analysis

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ABSTRACT: This project uses dictator game responses to analyze how generous behavior varies between individuals of different levels of religiosity in various levels of anonymity. Analyzing the characteristics of those who are generous can allow organizations and individuals to target their effort to those more likely to contribute. With the importance of identity coming to economics this paper seeks to take standard methods for looking at altruistic tendencies and analyze how they vary across groups and settings. Generosity is often associated with religion and those who are religious are seen as a source of generosity and charity, so religiosity provides a natural grouping, the hypothesis being that those more religious individuals are more altruistic in non-anonymous, 'familiar' situations. This paper finds that religious individuals in familiar situations give less, but not at a significant level.

Keywords: Dictator Game, Religiosity, Anonymity, Altruism

I.   <u>Introduction:</u>

Walking down the street one passes a homeless person, and one may or may not choose to give him the change he is asking for. Further down the street there is a donation box along the road asking for funds for a local charity, again the option of giving returns. The question is who would? When two individuals walk by the homeless person, one secular the other religious, who is more likely to give, and of more interest, who is more likely to give to the homeless person versus the charity box down the road?

Individuals around the country practice religions in different unique, but often related, ways. My research interest is in how these variations in *religiosity* effect how individuals behave. With globalization, there is a wide array of ways in which individuals can interact, from fairly anonymous e-mails, to in-person confrontations. Besides the impact of individual characteristics on behavior, this situational variable of *anonymity* also can have some effect on decision-making.

The behavior I seek to analyze with these variables is generosity. From holiday gifts to charity donations, humans are known to be generous and I seek to look and see if the characteristics and situations that we find ourselves in are what make us generous. If so, then is there a systematic way in which this occurs so that more generous action can be induced to create more giving. Previous literature is inconclusive as to the effect of *religiosity*, while fairly consistent in the prediction that less *anonymity* yields more generosity. This paper builds on this work and looks to see if less *anonymity* leads to more generosity in those of greater *religiosity*, as compared to those that are less religious.

The following, Section II, is a review of the relevant literature and how it served as an example or is applied to my study. Section III contains the economic model and theoretical basis

for the analysis. The empirical work is then found in Section IV where the data is described

along with the strategy for analysis and results. Section V concludes the paper and proposes

future work.[2]

II.   Literature Review:

The literature consulted for this research spanned all of experimental economics, but the

most relevant fell into four main categories, summarized below. They are (a) the dictator game,

(b) culture, (c) anonymity, and (d) the interaction of culture and anonymity.

a.   *Dictator Game*

The dictator game (DG) entails having a player (the proposer) receive a set amount of

money (the pot) and then decide how much they shall keep and how much they shall give to their

opponent (the recipient) at which point both players receive the money according to the

allocation. The DG makes its first appearance in the experimental economics literature in

Kahneman et. al. (1986), since that point it has been the subject of many papers. Based purely on

payoff maximization the equilibrium is for the proposer to keep the entire pot and not allocate

any to the recipient. This equilibrium has not been observed in many of the papers written on the

subject. The issue that some find is that the results from DGs are highly volatile and vary

dependent on the framing as different social norms are triggered by different cues. While some

see this as a problem, Guala and Mittone (2010) conduct a thorough review of the literature and

assert that the DG "…is likely to be mainly useful to study the effect of contextual cues that

determine the framing and triggering of social norms." It is in this way that the DG has been

used of late and I purpose to continue this usage by using the DG to build on two distinct lines of

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[2] Section VI contains the references, VII the tables, VIII the figures, and IX the appendices.

literature regarding social norms and behavior: those associated with culture, specifically

religiosity, and those associated with anonymity.

b.   *Culture*

Akerlof and Kranton (2000) discuss the concept of incorporating identity into economic

models of behavior. They explain that the identity of a participant enters into their decision as a

characteristic which is a determinate of their utility function and their accepted norms. They go

on to show this using both a simple game-theoretic model and adaptation to real world scenarios,

such as gender discrimination and the economics of poverty. In this way they established a

precedent for the modeling of different populations having different norms of behavior and

validate that it can have large effects on the results. Such behavioral differences across-cultures

are the subject of many current papers. The literature on culture and behavior can be classified

by the variable that they use to group the populations; some examples include nationality,

gender, religion, and religiosity.

Nationality is the most obvious indicator of culture and thus variations across countries

have been thoroughly analyzed. Henrich et. al.(2005) went so far as to test variations in behavior

across 15 small-scale societies around the world. Their analysis was limited to the ultimatum

game[3] because of the lack of dictator game experiments globally. They found that certain

measures of culture had substantial effects of predicting the difference in actions between

societies. While Henrich et. al. (2005) only look at intra-group games, their research is extended

by Chuah et. al. (2009) who compare results of ultimatum games between British and

Malaysians, with the result of still finding significant difference in individual behavior based on

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[3] An ultimatum game (UG) is similar to a dictator game, but the recipient has the option to reject the proposal of the dictator, in which case neither receives any payoff. While interesting, UG introduces strategic reasoning which tends to mask the effect of fairness preferences and thus it is beyond the scope of this paper.

culture and more importantly variations within a religion based on information about the opponent.

Similar analysis has been conducted along gender lines to assess its effect on behavior. Andreoni and Vesterlund (2001) find that behavior does vary across gender, but it is dependent on the size of the pot with men being more altruistic with smaller pots and women with larger pots. Conversely, (GE Bolton and E Katok, 1995) find no significant difference between the responses on men and women in their test of the dictator game. Conflicts in the literature, such as these often originate from varying experimental design. Bolton and Kaatok (1995) postulate that their different results may be "…attributed to differences in subject knowledge of the gender of the other player." This idea of the information available about the opponent effecting the action will be revisited later in the discussion on anonymity.

Much like nationality and gender, religiosity has the same potential to be possible predictors of behavior. While not covered as extensively, it has recently begun to receive attention in the literature. Tan (2006) found that religiosity as a general parameter was not significant in a dictator game, but his definition of religiosity was a composite of a number of different measures, additionally the research was heavily Christian-centered. Benjamin (2010) uses priming to exogenously create variation in religiosity and compares results of increased religiosity across religion in a number of games including the DG, but find that increasing religiosity does not increase generosity in Judaism, Christianity, or Protestantism. Anderson etl al. (2010) put it best when they say that "[i]n short, what little is known about how religion influences behavior in common experimental games is somewhat mixed." They go on to find that religious affiliation (religion) and observance (religiosity) do not have a large effect on the result of trust games. This does not stop them from encouraging further research into the effect

of religion on behavior. Specifically, they note that "…the differences in observed behavior and outcomes between religious and non religious people may have more to do with differences in unobserved confounders, such as social environment or circumstances, than differences in preferences." This paper seeks to explore this interaction between individual characteristics, such as *religiosity,* and environmental factors, like opponent anonymity. The motivation being that the lack of anonymity will trigger cues for generosity that are stronger in religious individuals than those of non-religious, for this paper termed 'secular'. For this paper religiosity is measured as frequency of religious attendance as self-reported in a survey administered after the experiment.

c. *Anonymity*

Schelling (1968) established that the more we know about our opponent, the more likely we are to care about them and experimental results have tended to support this finding. This concept has come to be referred to as the "identifiable victim" concept. While some argue that anonymity and social distance is best measured as "the degree of reciprocity that a subject believes exists" (E Hoffman et al., 1996), Bohnet and Frey (1999) argue that a better measure is the amount of information a participant has about their opponent which is a manifestation of Schelling's (1968) "identifiable vistim" concept. For this reason they conduct analyses with one-way and two-way visual identification in a DG showing that increasing the information resulted in more generous results that were significant at larger levels of identification (two-way visual), and there was no significance at lower levels.

The design of Bohnet and Frey (1999) allows for more information about the opponent, but at the same time may be confounded by biases that the player has about specific characteristics of the opponent. While Bohnet and Frey (1999) use identification in a face-to-face context, the same result is also found to hold for the DG when identification is done using purely

a picture of the opponent (Terence C. Burnham, 2003) and further when just the last name of the opponent is used (Gary Charness and Uri Gneezy, 2008) with the added benefit that both results are also significant for the one-way identification. To avoid confusion between the identification, as an opposite to anonymity, and references to identity of the participants, the former shall here on be referred to as the 'familiarity'.

a.   *Culture and Anonymity*

My research seeks to join a young line of research who's goal is to analyze how the generosity differential between anonymous and familiar changes across culture. This has already been done with respect to 'culture', as measured by collectivist or individualist, in an investment game[4] (Nancy R. Buchan, Eric J. Johnson and Rachel T. A. Croson, 2006). Buchan et.al. (2006) concluded that behavior in the investment resulted from the shift in anonymity, but had varying effects depending on the 'culture' of the subject. Buchan found that in the investment game the interaction between anonymity[5] and 'culture' has a significant coefficient at the 95% level in the regression of the amount sent and at the 90% level for the proportion of amount returned.

Similar work was done by Dufwenberg and Muren (2006) with gender and anonymity in the dictator game. In that paper, the concept of anonymity varies slightly from how I frame it. Instead they seek to look at anonymity in terms of whether others know about a participants actions, rather than if a participant knows about their opponent. While this does not allow the results to directly translate, the analysis conducted is what I seek to emulate, because while they do not reach conclusive results about differences in gender the question they ask of differences in giving across groups in different setups is similar to that which I am interested in. The extension

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[4] Another extension of a dictator game in which the money sent is then tripled and the recipient can then choose how much to send back to the sender.
[5] Measured by 'in-group' bias, which is similar to anonymity because with an 'in-group' the experiment is manipulated so that the participant is more familiar with members of the 'in-group'

of this literature that I would wish to explore would look at how religiosity interacts with anonymity. This has yet to be done in the literature, but is crucial to assessing how individual identity interacts with the environment of the game.

III.   Economic Model:

Every individual has preferences over fairness, which can be formulated as a combination of two related goods: how much they receive (x), and how much their opponent receives (y). In a dictator game when they are given a budget constraint (B), a certain quantity of money to be divided among the two players, an individual will make a consumption decision and decide exactly how much he and the other person receive. This model rests on the assumption that individuals are rational and want to maximize their well-being. In this case rationality is assumed over a utility function[6], $U=u(x,y,\gamma)$, that includes fairness, in the form of γ, and other-regarding preferences (ORPs), because it is dependent on both x and y. My hypothesis is that these utility functions vary across religiosity and anonymity because of variation in the level of fairness preferred. (Jonathan H. W. Tan, 2006).
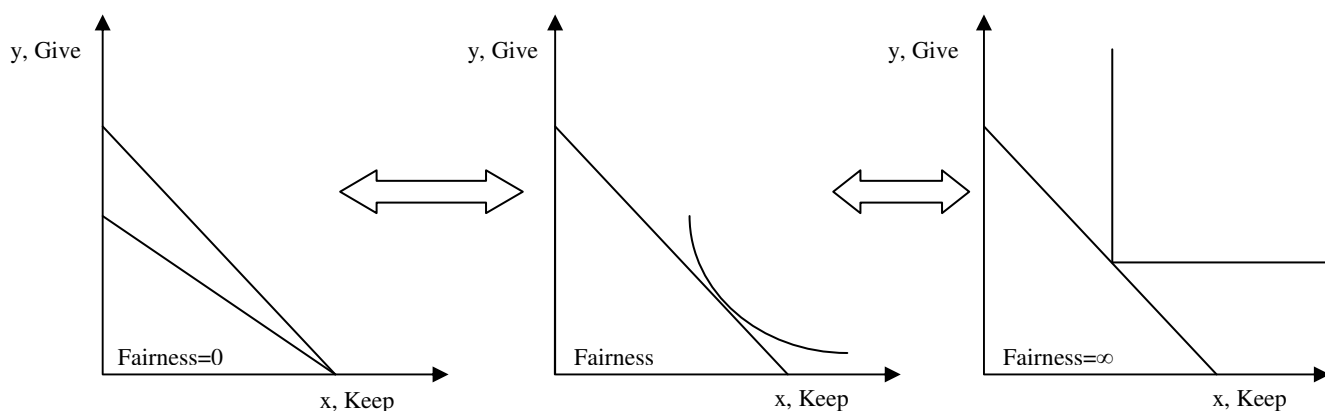
In this model the budget constraint ($x+y=B$) has a slope of -1 because every dollar not kept by the individual is given to the other player. Additionally, the preference structure is

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[6] This formulation for the utility function is also used in Tan (2006).

assumed by completeness to have all allotments ranked against all others, whether greater than, less than, or equal to, in terms of utility. Additionally, transitivity, continuity, and non-satiation of preferences are assumed, a claim validated in general in work by Andreoni and Miller (2008). These preferences are aggregated into a utility function that gives an equation for the preference level of a given bundle, in this case a certain allocation.

The theory is that with a constant budget constraint across experiments the variations in y, the amount given, will result from the differences in the utility functions that cause the indifference curves to intersect the utility functions, when optimizing, at various points along the budget constraint. This is due to the transformation of the utility function. With a fairness variable, γ, of 0 there is no anticipated fairness and thus y is essentially 0, and it is a substitute problem with a corner solution. As fairness increases the indifference curve becomes more bowed. Finally, under perfect fairness the indifference curve is that of a complement because a participant is hypersensitive to the others preferences. Such variation is also witnessed in Andreoni and Miller (2008) in their analysis of altruism in testing the axioms of revealed preferences. Their experiment finds that individuals have a range of utility functions[7] with varying degrees of fit. Future work can include testing individuals across various budgets in order to yield a better picture of the shape of the utility function of individuals from different groups. For the purposes of this paper the variation in behavior is attributed to various functional forms. In terms of my work this translates into the fairness $\gamma(id,anon)$ being dependent on the player's identity (*id*) and the games anonymity (*anon*).

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[7] The functional form he references are selfish (in terms of my framing when fairness=0) and Leontief (in terms of my framing when fairness=∞).

If my hypothesis holds then the form of each individual's utility function will be dependent on his/her religiosity and anonymity. The resulting action will then be dependent on that functional form and by transitivity on the individual's religiosity, and anonymity.

IV.   Empirical Section:

a.   *Statistical and Econometric Model:*

In order to test for differences in *y,* the amount given, and derive the factors that influence it, a regression is required in order to understand the variability in religiosity and/or anonymity. I plan to control for characteristics, like race and gender, of the participant. Additionally, controls for covariates such as experiment session and version will also be included in order to assess the effect of the setup. My hope is to find significance in the coefficients on the anonymity, religiosity, and interaction [8]variables. The functional forms of the regressions would be as follows:

$$\text{Give} = \alpha_0 + \alpha_1 \,[\text{Religiosity}] + \alpha_2 \,[\text{Familiarity}] + \alpha_3 \,[\text{Religiosity X Famliarity}]$$
$$+ \, \tau_1 \,[\text{Characteristic Controls}] + \tau_2 \,[\text{Experimental Controls}] + \varepsilon_i$$

Because of the multiple levels of the analysis the following are specifications of different hypotheses to be tested. These factors are included because the economic model dictates that the response is a result of different utility functions that stem from differences in fairness as dictated by religiosity identity and the anonymity[9] of the situation.

The first step in the analysis is validation of the existing literature which has found that the amount given, *y*, under familiarity, *F*, is more than that in the anonymous, *A*, condition. This can be modeled by the following null and alternative hypotheses:

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[8] Specifically, Religious X Familiar

[9] Its opposite, Familiarity, is used in the analysis for ease of interpretation. The difference being that the indicator for familiar is 1 in familiarity and 0 in anonymity.

$$H1_0: F = A \quad H1_A: F > A$$

In terms of the regression this is equivalent to:

$$H1_0: \alpha_2 = 0 \quad H1_A: \alpha_2 > 0$$

My research seeks to first add a second layer to this analysis by verifying that this holds for all religiosities, i, in the sample, S. The null hypothesis in this case being that there is no difference between the anonymous, A, and familiar, F, treatments, which should be rejected because of previous research. In this case the model is as follows:

$$H2_0: \forall i \in S, F_i = A_i \quad H2_A: \forall i \in S, F_i \neq A_i$$

In terms of the regression this is equivalent to:

$$H2_0: \forall i \in S, \alpha_{3_i} = 0 \quad H2_A: \forall i \in S, \alpha_{3_i} \neq 0$$

Finally, a comparison can be done to see if the above variation between familiar, F_i, and anonymous, A_i, treatments, by all individuals of religiosity i, is equivalent to the same variation by individuals of all other religions, j:

$$H3_0: \forall i \in S, \forall j \in S, [F_i - A_i] = [F_j - A_j]$$

$$H3_A: \forall i \in S, \forall j \in S, [F_i - A_i] \neq [F_j - A_j]$$

In terms of the regression this is equivalent to:

$$H3_0: \forall i \in S, \forall j \in S, \alpha_{3_i} = \alpha_{3_j}$$

$$H3_A: \forall i \in S, \forall j \in S, \alpha_{3_i} \neq \alpha_{3_j}$$

b.   *Description of Data*:

The data comes from an experiment, run for a capstone paper as part of a Senior Economic Research Seminar at American University, with 26 undergraduate students within 3 sessions recruited through university-wide e-mail. The message can be found in Appendix (a). The participants included 16 females and 10 males with an average age of 20. This project was

run in conjunction with an unrelated experiment for an additional paper. The participants each were seated around a table and asked to perform one anonymous dictator game for $30 playing an unknown player B and a familiar dictator game for $30 against another participant that was seated across from them. There was no communication allowed from the moment the participants entered the testing environment until they left. The instructions for the participants can be found in Appendix (b).

Participants were randomly assigned a seating and randomly assigned whether they received the anonymous dictator game or familiar dictator game first. At the end of the session they completed a post-experiment survey and were each given $5 for participating in the session. Additionally, from each session two dictator games were drawn at random and the participants were awarded the actual division. By using a complete random design the variation in participant pairing allows for analysis to be done solely dependent on the characteristics of the participant and not on his/her opponent. The post-experiment survey, which can be found in Appendix (c), gathered data on the demographic characteristics of the participants as well as distraction questions.

Table 0(i)

The small sample led to many complications in the analysis. In order to make a conclusion about a specific religiosity a large enough sample is required. In order to create a large enough sample they were split in two, less (RelAtt=0) and more (RelAtt=1) religious. The metric by which they are divided is self-reported frequency of attendance of religious services.

Table 0(ii)

The regressions use age, race and gender as characteristic controls. In terms of the regression this is equivalent to:

$$H_0: \tau_1 = 0, H_A: \tau_1 \neq 0$$

Age is a continuous variable and as such is necessary to include in order that the analysis can be conducted using regression, as opposed to ANOVA. Because the majority of the participants, 18 of 26 were white (rac6) that indicator was the only one included as a control. Finally, because of colinearity only one gender indicator needed to be included and so the indicator for male (gen2) was included. In order to include experimental controls indicators for the session (sess2 and sess3) and version (ver1) that the participant received were added. In terms of the regression this is equivalent to:

$$H_0: \tau_2 = 0, H_A: \tau_2 \neq 0$$

c.   *Results*:

The first claim that is evaluated is the hypothesis that there is a significant difference between the anonymous (familiar=0) and familiar (familiar=0) treatments. The predicted result is that the familiar giving will be higher because the participant will humanize the opponent. This fact is found throughout the literature, as discussed in section II(c).

Figure 1

By inspection of the distribution of responses across anonymity, the potential for problems in the data becomes evident. Figure 1 makes it evident that there does not seem to be much variation between the anonymous condition and identification condition. In order to mathematically test for this variation the regression proposed in section IV(a) is conducted.

Table 1

As observed in Figure 1, the regression analysis finds that the coefficient of familiar is not significant (p=0.856) in regression (1) in Table 1, as well as the rest of the table. Thus we fail

to reject the null hypothesis of hypothesis 1 ($H1_0$) and cannot say if there is a difference across identification. While this may be due to the small sample size, this may also due to misunderstanding the situations, or some other error in the data. A test for such an error would look at the coefficients on the indicators for the experimental controls, if they are statistically significant that translates into a general effect on responses because of the experimental setup. Sure enough, the coefficients on session 2 (sess2) and version A (ver1) were both statistically significant at the 99% level in all 4 regressions in Table 1[10].

The bias resulting from session 2 is quantified by the coefficient in the regression, which ranged from 5 to 7. This indicates that those individuals in session 2 systematically gave more than those in other sessions. Possible causes for this bias include, but are not limited to, interaction prior to the experiment[11] and unnoted variation in verbal commands. In the analysis, little can be done to fix this, short of dropping the data from the session, which would seriously restrict an already small data set.

Similarly, the bias resulting from the version was quantified by the coefficient in the regression, which ranged from -5 to -6.7. This indicates that those individuals using version A systematically gave less more than those who had version B. While there are other possible causes deriving from our small sample, the other likely cause is that the fact that whichever dictator scenario they received first influenced their response in the next one. In version A, participants received the anonymous dictator game first, and as the literature shows were less generous, which caused them to be less generous in the familiar dictator game. This reason assumes the fact that the anonymous treatment is statistically different, but because it influences the other half of the data, the analysis of the full 52 data points would not show this difference.

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[10] Except session 2 in Table 1 (1) which is still significant at the 95% level
[11] While technically not permitted, the possibility cannot completely be ruled out.

In order to validate this reasoning, and receive more meaningful results, the same analysis must be conducted with only the 26 data points from the responses that the individuals had to the first question in their version, which while cutting our data in half, should also make it more informative.

Figure 2

As can be seen in Figure 2, the giving is more in line with what we would expect based on the literature. The amount given in the familiar dictator game[12] is slightly larger than that of the anonymous treatment.

Table 2

This difference also translates over to the statistical analysis. In regression (1) on Table 2, the new test of Hypothesis 1 yields much more significant results, with the coefficient on familiar being 6.1 with a p-value of 0.019. This is in line with previous research and theory because it dictates that the individuals that participate in the familiar experiment will give more than those in the anonymous condition.

Figure 3

In Table 2 and Figure 3 regression (2) and (3) introduce the religiosity, or how frequently the individual is religious, in (2) with the religiosity variable (RelAtt) alone, and (3) with the familiar variable. The literature is inconclusive about the expected sign of increased religiosity, especially when measured by religious attendance. In (2) religiosity is insignificant (p=0.857), but in Table 2 regression (3) both the coefficient of religiosity (p=0.1009) and familiarity (p=0.005) are fairly significant.

Figure 4

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[12] When only looking at Question 1

Finally, the last regression (4) in Table 2, visualized in Figure 4, is the full model that is used to test Hypothesis 2. As explained in section IV(a) this tests the interaction of religiosity and anonymity to see if different religiosities react differently to varying identification. The author became interested in the topic thinking that the coefficient on the religiousXfamiliar (FamiliarRelig) interaction variable would be positive. This analysis shows that this coefficient on the interaction is not significantly different (p=0.189). For this reason we fail to reject the null hypothesis that there is no religiosity-dependent difference between anonymous and familiar treatments. Of note is that while the coefficient is not significant it is negative, -7, meaning that more religious people are less likely to give more in familiar situations, which is unexpected and if validated in larger studies would be an interesting result.

The last hypothesis involving religiosity, Hypothesis 3b, cannot be tested because the small sample required that the religiosities are grouped into just two categories, thus there is no way to compare coefficients on the interactions without confronting colinearity problems in the regression.

Another metric to assess the addition of the interaction variable is the predictive ability of the regressions as measured by the adjusted-R^2. If the interaction provides a large boost in the predictive ability of the regression, then it may still be a component in prediction. The adjusted-R^2 of Table 2(4), with the interaction, is 0.28 which is only slightly larger than the 0.245 of 2(3) which still includes religiosity and larger still than the 0.171 of 2(1) that just has the familiarity variable. This increased predictive ability is important to note.

d.   *Interpretation*:

The analysis in this paper validates the existing literature that stipulates that behavior will change with anonymity. In terms of the economic model this constitutes the familiarity treatment

increasing the fairness variable γ and thus shifting the functional form of the utility function of those that received that treatment first.

Ultimately, the small sample restricted much of the analysis that was conducted and made finding significant variables much harder and thus limiting the conclusions that could be drawn from the results. As noted, bias from the experimentation set-up resulted in having to restrict the data used in the analysis. Additionally, there are possible errors in the experimentation that could have further obscured the data, as witnessed be the persistent bias of session 2. If this experiment were to be conducted again, more attention would be paid toward limiting the amount of shared information in order to prevent bias due to the fact that the subject may be influenced by a 'demand effects' because they perceive what they believe the experimenter would like, and thus do not react naturally. [13]

As with any laboratory experiment in the field of economics there are certain issues that also must be considered. Notably, the sample size will never be truly representative of the greater population, specifically because it is comprised mainly of undergraduates, but because this is standard practice in the field I am not concerned with this error.

V.   Conclusion and Directions for Future Research:

As noted in section IV(d) there are many realized and possible flaws in the experiment, but with this in mind some results were of interest. First, the literature was validated in findings that reduced anonymity, or familiarity, does increase giving. Additionally, those less religious individuals, as measured by their religious attendance, had higher levels of giving in the familiar

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[13] Another interesting finding of this paper arises from happenstance, but is interesting to note. That finding being that whichever dictator game, anonymous or familiar, a participant is presented with first highly influences his/her behavior in the second. This is worth exploring in more detail in future research regarding the effects of framing on behavior.

treatment, but not at a significant level. I must reiterate that the analysis was severely limited because even when the subject pool was grouped into larger groups, there was never a sufficient amount of any subgroup to assure that the statistical measurement would likely hold for a larger sample.

The next stage of this project will involve more rigorous tests for the shape of the utility function for each individual. The claim that this paper makes, that the variation in religiosity results in a variation in utility functions, through observation of one action, while plausible is worth further validation. With a new, more controlled round of experiments, I hope to be able to more confidently declare that a given participant has a given utility function. In doing so I will be able to then analyze the proportion of 'generous' utility functions in a given subpopulation to see if the can be considered more likely to be generous. A more defined utility function can be constructed using techniques similar to in Andreoni and Miller (2008) and conducting multiple dictator games with different budget constraints. In the short term this comes at the cost of analyzing the anonymity component, because of limited resources, but would still help the field in reaching a more conclusive result regarding the impact of religiosity on generosity. Long term future research will include more complex games, larger samples, different measures of culture, and different environmental factors in order to explore the variety of factors that influence behavior and preferences.

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VII.   Tables:

Table 0

(i)

RelAttend	Freq.
More than once a Month	1
More than once a week	3
More than once or twice a year	5
Never	4
Once a Month	1
Once a Week	6
Once or twice a year	6

RelAtt=0

RelAtt	Freq.
1	11
0	15

(ii)

Please specify your race.	Freq.
Other	2
Asian	3
Black or African American	3
White	18

Gender	Freq.
Female	16
Male	10

Age	Freq.
18	7
19	8
20	4
21	3
22	2
24	1
25	1

Session #	Freq.
1	9
2	7
3	10

Version	Freq.
A	14
B	12

Table 1

	(1)	(2)	(3)	(4)
VARIABLES	give	give	give	give
familiar	0.308		0.308	0.0667
	(1.687)		(1.663)	(2.215)
RelAtt		-3.550	-3.550	-3.835
		(2.331)	(2.357)	(2.929)
FamiliarRelig				0.570
				(3.405)
gend2	-0.382	-0.844	-0.844	-0.844
	(1.959)	(1.934)	(1.955)	(1.978)
rac6	-0.340	-1.312	-1.312	-1.312
	(2.060)	(2.107)	(2.131)	(2.155)
age	0.0568	0.124	0.124	0.124
	(0.562)	(0.550)	(0.556)	(0.562)
sess2	5.387**	6.580***	6.580***	6.580***
	(2.239)	(2.320)	(2.345)	(2.372)
sess3	1.402	0.491	0.491	0.491
	(1.996)	(2.036)	(2.059)	(2.083)
ver1	**-5.161***	**-6.621***	**-6.621***	**-6.621***
	(1.845)	**(2.038)**	**(2.061)**	**(2.084)**
Constant	10.70	12.69	12.53	12.65
	(11.45)	(11.20)	(11.35)	(11.51)
Observations	52	52	52	52
R-squared	0.264	0.301	0.301	0.302
Adjusted R-squared	0.147	0.189	0.171	0.152

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2

VARIABLES	(1) q1give	(2) q1give	(3) q1give	(4) q1give
q1familiar	6.150**		8.204***	11.96***
	(2.392)		(2.588)	(3.730)
RelAtt		-0.582	-4.995	-1.719
		(3.174)	(2.960)	(3.754)
q1FamiliarRelig				-7.614
				(5.567)
gend2	0.145	-0.838	-0.505	-0.110
	(2.540)	(2.980)	(2.455)	(2.415)
rac6	0.879	-0.272	-0.489	-1.438
	(2.671)	(3.250)	(2.676)	(2.704)
age	-0.243	0.377	-0.148	-0.165
	(0.729)	(0.824)	(0.698)	(0.682)
sess2	5.377*	6.237*	7.055**	6.047*
	(2.904)	(3.565)	(2.945)	(2.970)
sess3	1.114	1.512	-0.168	-2.159
	(2.589)	(3.075)	(2.585)	(2.915)
Constant	10.96	2.575	11.48	12.60
	(14.08)	(15.98)	(13.45)	(13.16)
Observations	26	26	26	26
R-squared	0.370	0.153	0.456	0.510
Adjusted R-squared	0.171	-0.115	0.245	0.280

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

VIII.   Figures:

Figure 1

Figure 2

Figure 3

Figure 4
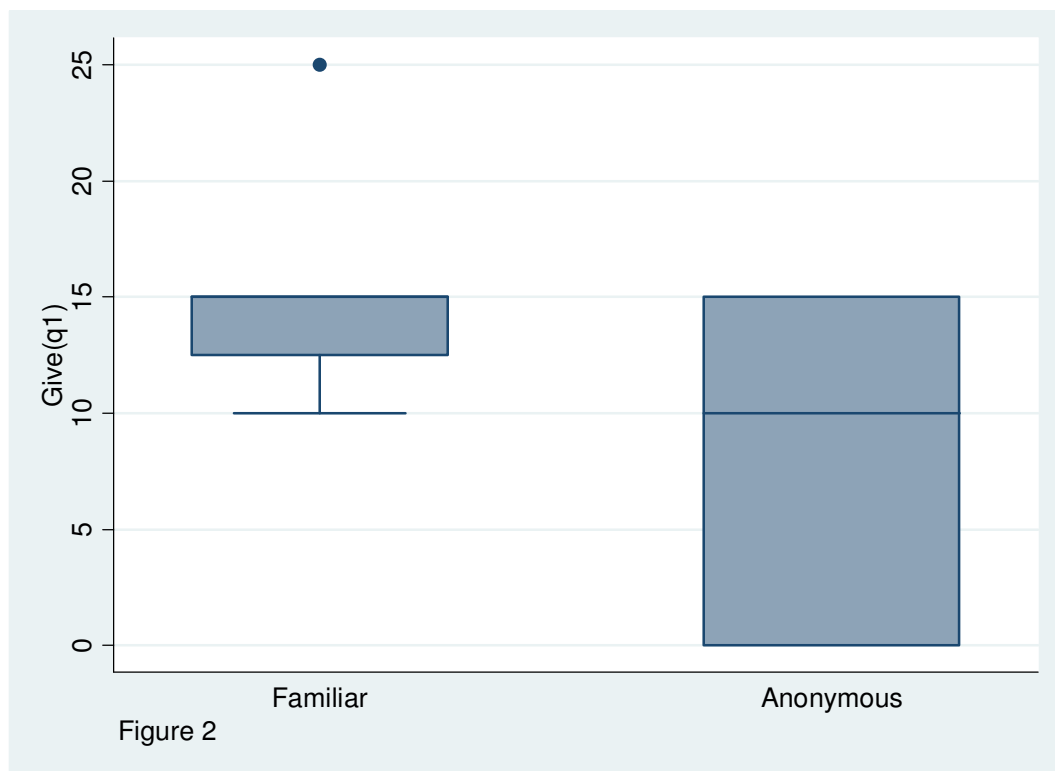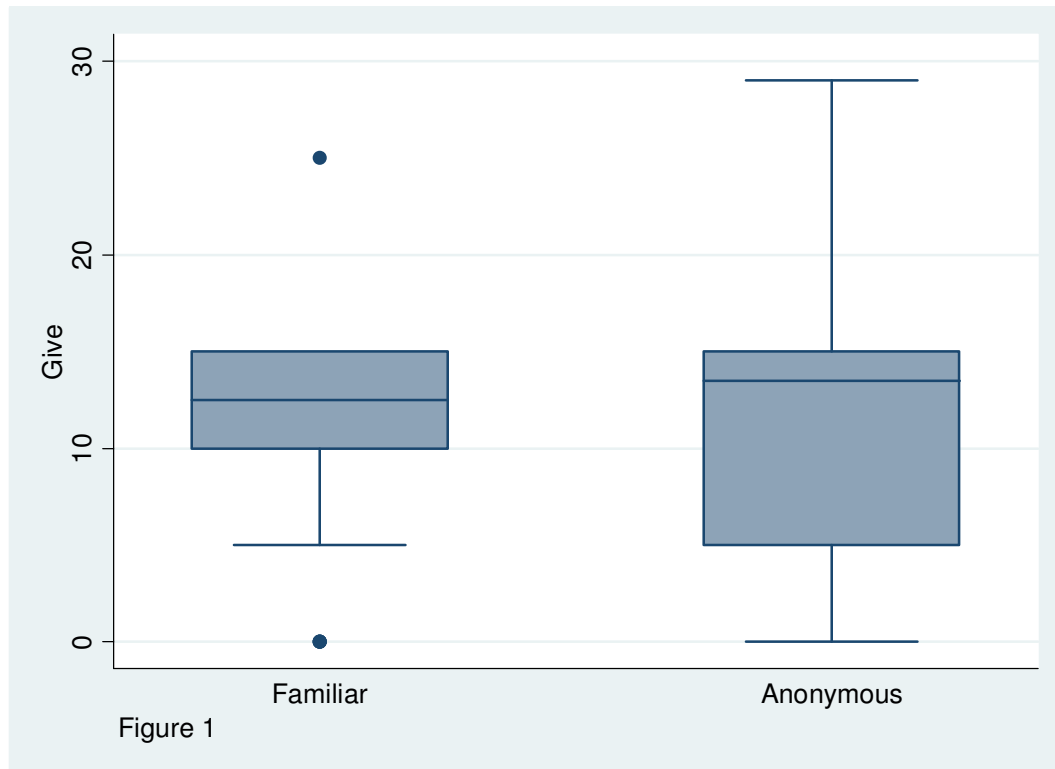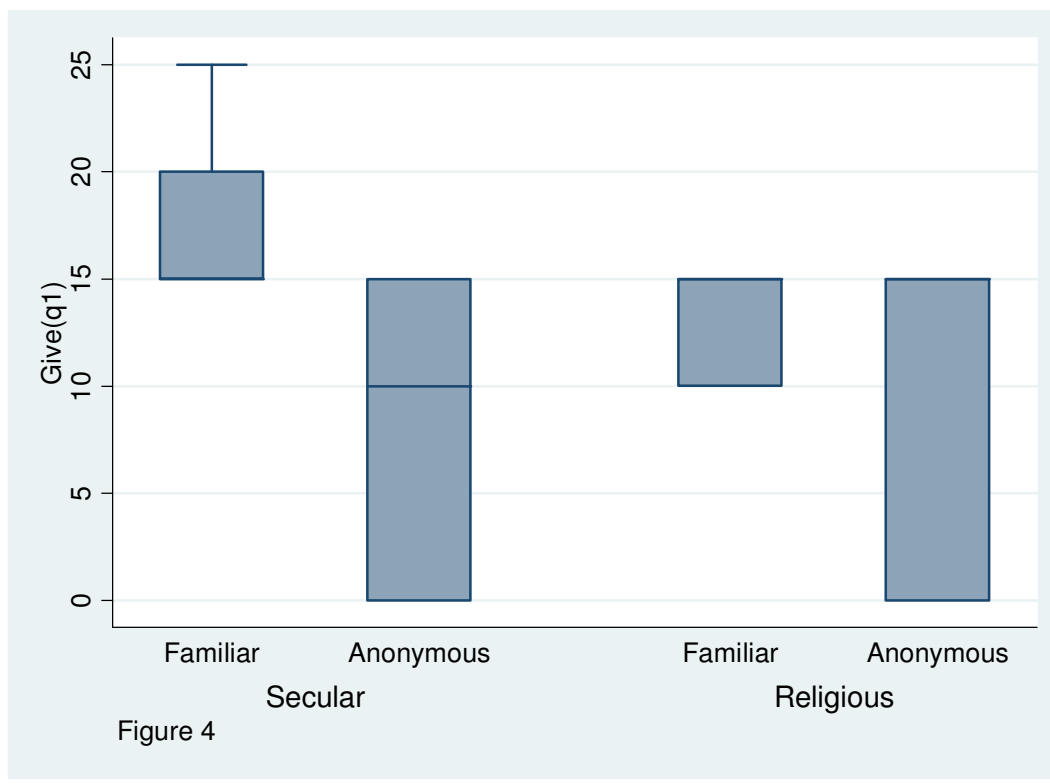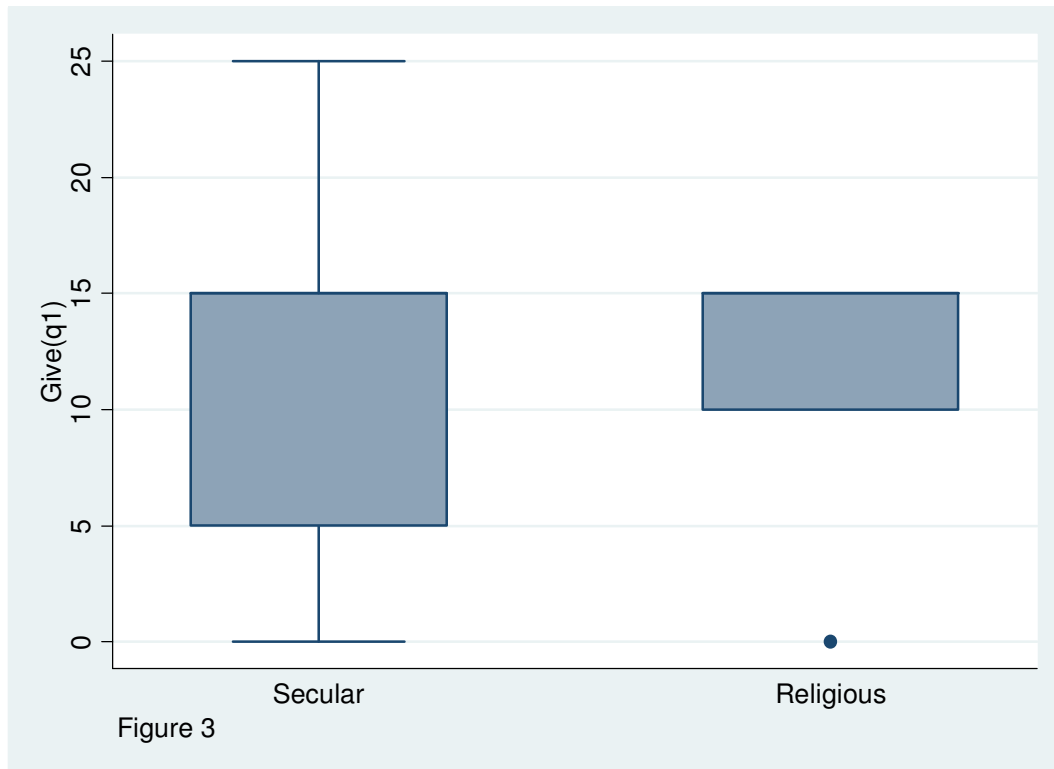
IX.   <u>Appendices:</u>
    a.   Advertisement for participants:

Students Wanted for PAID Participation in Research. Undergraduate participants (at least 18 years old) are needed for a study on decision making. The session takes about 45 minutes, for which participants will be compensated with at least $5. If you are interested in participating or would like more information, please e-mail experimentau@gmail.com.

b. Informed Consent Form:

EXPID #_____

Seat #_____

Informed Consent Statement

Study Title: Senior Economic Research Seminar Project

Time commitment: The study is anticipated to take 45 min.

Task: You will play games that involve making a decision, and then you will fill out a survey.

In order to participate in this research study, it is necessary that you give your informed consent. By signing this informed consent statement you are indicating that you understand the nature of the research study and your role in that research and that you agree to participate in the research. Please consider the following points before signing:

- I understand that I am participating in research conducted by Ayal Chen-Zion, Jason Boim and Will Torgerson for their senior capstones.

- I understand that all information I provide will remain confidential. The records of this study will be kept private. In their capstones and associated presentations, the researchers will not include any information that will make it possible to identify me. Research records will be kept in a locked file cabinet in Kreeger 127; only the researchers will have access to the records and my signed consent form will be stored separately from my data to insure complete confidentiality;

- I understand that after the experiment is over, I will be provided with an explanation of the research in which I participated and be given the name and telephone number of an individual to contact if I have questions about the research. In addition, I understand that I may contact Professor Mary Hansen, at 202-885-3793, if I have questions concerning my rights as a participant in research or to report a research-related injury;

- I understand that the researchers might not, initially, tell me the true or full purpose of the study. However, the complete facts and true purpose of the study will be revealed to me at the completion of the session;

- I understand that participation in research is not required, is voluntary, and that, after any individual research project has begun, I may refuse to participate further without penalty;

- I understand that the researchers do not anticipate any risks to participating in this study other than those encountered in day-to-day life.

- I understand that decisions I make in the course of the experiment will dictate the compensation I receive.

By signing this form I am stating that I am over 18 years of age, and that I understand the above information and consent to participate in this study being conducted at American University.

Signature: _____   **Today's Date:** _____
               (of participant)

First Name (print): _____   Last Name (print): _____

c. Instructions: (Version A)

PLEASE TURN OFF ALL ELECTRONICS AND REFRAIN FROM COMMUNICATING
AND INTERACTING WITH OTHERS DURING THE ENTIRE EXPERIMENT, UNLESS
PROMPTED BY THE EXPERIMENTER

FOLLOW THE INSTRUCTIONS PROVIDED.

I acknowledge that I have signed the informed consent form <u>X_____</u> (Initial)

You have been asked to participate in an experiment. For your participation today you will be
paid at least US$ 5 in cash at the end of the experiment, the exact amount will be determined by
your decisions.

DO NOT PROCEED UNTIL PROMPTED BY EXPERIMENTER

In the following questions, you will be paired with different people and in each you will be asked to make a decision that will affect how much you both receive at the end of the experiment. At the end of the session people will be randomly selected to receive the amount of money that was allocated in these decisions. None of the other participants will know who won and what quantities were allocated.

You are handed US$ 30 and are told that you can decide how much to keep and how much to give to the Player B. You will not be told who they are, either during or after the experiment, and they are unaware who you are. You decide to…

KEEP: US$ _____

GIVE: US$ _____

(Must add up to US$ 30)

[In Version B this question is second]

WHEN COMPLETE PUT YOUR PEN DOWN. DO NOT CONTINUE UNTIL PROMPTED BY THE EXPERIMENTER

You are handed US$ 30 and are told that you can decide how much to keep and how much to give to the player seated across from you. You decide to…

KEEP: US$ _____

GIVE: US$ _____

(Must add up to US$ 30)

[In Version B this question is first]

WHEN COMPLETE, CONTINUE READING ON NEXT PAGE.

You are now the receiver of two allocation decided by another participant. The questions they face are the same as yours from the last pages. If their decision is chosen, at the end of the session, then you will receive compensation dependent on their decision.

WHEN COMPLETE, TURN THE PACKET FACE DOWN PUT YOUR PEN DOWN. DO NOT CONTINUE UNTIL PROMPTED BY THE EXPERIMENTER PLEASE CONTINUE TO NOT COMMUNICATE WITH OTHER

[EXPERIMENT #2, beyond scope of paper]

PLEASE PUT YOUR PEN DOWN.

REMOVE THE *PARTICIPANT COPY* OF THE INFORMED CONSENT FORM.

PLACE THE REST OF THE PACKET FACE DOWN ON THE TABLE, THE EXPERIMENTER WILL COME BY TO COLLECT IT. WAIT FOR AN OPEN TERMINAL. AT WHICH POINT, AN EXPERIMENTER WILL TELL YOU TO FILL OUT THE SURVEY, AND THEN RETURN TO YOUR SEAT. PLEASE DO NOT COMMUNICATE WITH THE OTHER PARTICIPANTS UNTIL EVERYONE HAS COMPLETED THE SURVEY.

d. Post-experiment Survey

Post-experiment Survey

Please fill out the form to the best of your ability. If you have any questions, raise your hand and an experimenter will be by to help.
* Required

What ID# were you assigned when you entered the experiment? *

(##) Found on the top left of your Informed Consent Form

In a few sentences, describe what made you choose the actions that you played for the splitting the money game.

What do you think the experiment involving splitting the money was about? *

In a few sentences, describe what made you choose the actions that you played for the A-N-S game. *

What did you think the A-N-S experiment was about? *

What is your sex? *

☐ Male

☐ Female

Are you a(n)... *

☐ Undergraduate

☐ Graduate

☐ Other:

How many years old are you? *

Please enter just a number, so someone who is 20 years old would enter "20"

What semester did you begin study at AU? *

e.g. "Fall 2010", "Summer 2009", "Spring 2008", etc.

What religion/belief was practiced in your household growing up: *
Choose all that apply

☐ Christianity (Orthodox)

☐ Christianity (Catholic)

☐ Christianity (Protestant)

☐ Christianity (Non-denominational)

☐ Christianity (Other)

☐ Judaism (Orthodox)

☐ Judaism (Conservative)

☐ Judaism (Reform)

☐ Judaism (Non-denominational)

☐ Judaism (Other)

☐ Islam (Shi'a)

☐ Islam (Sunni)

☐ Islam (Non-denominational)

☐ Islam (Other)

☐ Hinduism

☐ Buddhism

☐ Agnostic

☐ Atheist

☐ Other: [   ]

Please specify your race. *
Choose all that apply

☐ American Indian or Alaska Native

☐ Asian

☐ Black or African American

☐ Native Hawaiian or Other Pacific Islander

☐ White

What religion/belief do you identify with? *
Choose all that apply

☐ Christianity (Orthodox)

☐ Christianity (Catholic)

☐ Christianity (Protestant)

☐ Christianity (Non-denominational)

☐ Christianity (Other)

☐ Judaism (Orthodox)

☐ Judaism (Conservative)

☐ Judaism (Reform)

☐ Judaism (Non-denominational)

☐ Judaism (Other)

- ☐ Islam (Shi'a)
- ☐ Islam (Sunni)
- ☐ Islam (Non-denominational)
- ☐ Islam (Other)
- ☐ Hinduism
- ☐ Buddhism
- ☐ Agnostic
- ☐ Atheist
- ☐ Other: _____

Where do you currently live? *
- ◌ On campus
- ◌ Off campus (apartment)
- ◌ Off campus (house)
- ◌ Other: _____

What is/are your major(s)? *

_____

If you have more than one major, which is more important to you? *

If not put N/A

_____

How often do you attend a house of worship? *
(Choose the one that most applies)
- ◌ Never
- ◌ Once or twice a year
- ◌ More than once or twice a year
- ◌ Once a Month
- ◌ More than once a Month
- ◌ Once a Week
- ◌ More than once a week

What is your permanent residences' household income? *

- ☐ Less than $30,000
- ☐ $30,000 to $49,999
- ☐ $50,000 to $79,999
- ☐ $80,000 to $99,999
- ☐ $100,000 to $149,999
- ☐ $150,000 or more
- ☐ Unknown

Do you believe the spiritual literature of your religion/belief is factually accurate? *

- ☐ Yes
- ☐ No
- ☐ Unsure
- ☐ Not Applicable

Which game would you prefer: *

- ☐ A game where you win $100 with a 100% chance
- ☐ A game where you win $50, with a 50% chance and $150, with a 50% chance

Have you attended a religious service of a religion/belief other than your own? *

- ☐ Yes
- ☐ No

How did you hear about this experiment? *

- ☐ Today@AU
- ☐ Teacher
- ☐ Flier
- ☐ Other: _____

Do you know Ayal Chen-Zion, Will Torgeson, and/or Jason Boim? *

- ☐ Yes
- ☐ No