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Green Behaviors in the Laboratory, Environmental Donations in the Field

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By

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ABSTRACT

Behavior within an experiment is generally explained by either a pure profit motive or a response to the context of the experiment which is likely driven by different factors such as individuals' environmental friendliness. Are participants in laboratory experiments responding to the context of the experimental setting and not merely to a profit motive? Using a preliminary analysis, I draw evidence from data collected in a two-stage laboratory experiment designed and conducted by Palm-Forster et al. (In Press) at the University of Delaware. In the first stage of the experiment, participants performed a series of tasks concerning their tradeoffs between monetary profits and environmental friendliness. In the second stage, participants made a choice of donating to a large environmental organization. In total, 156 undergraduate students participated in the experiment. The analysis in this paper provides preliminary results that need to be verified in future research after overcoming key model specification issues.

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NGO = Non-governmental organization

C1 = No policy control

T2 = Treatment 2

T3 = Treatment 3

T4 = Treatment 4

1. INTRODUCTION

The last few decades have witnessed vast technological advances bringing along with it unfavorable byproducts that interfere with and have had lasting impacts on the ecosystems. Therefore, there arises a need to understand the importance of conservation and ecosystem preservation and the steps to remedy the disruption. According to the Glossary of Environment Statistics, 'environmental protection' can be categorized as the activity to preserve or restore the quality of environmental media by reducing the production of pollutants or the presence of polluting substances which encompasses changes in production techniques and consumption habits (Glossary of Environment Statistics, Studies in Methods, Series F, No. 67, United Nations, New York, 1997).

With the growing need for awareness and conservation, there has also been a remarkable increase in the number of environmental organizations catering to a host of problems at a national and international level most of which are non-governmental, not-for-profit organizations. One of the most important roles that these Non-Governmental Organizations (NGOs) can play in global environmental governance, is to provide up-to-date information on critical issues in their respective fields. Addressing problematic areas also becomes easier in the absence of bureaucracy.

While the problems addressed by these organizations are all important, it is of note that they are all run with motives to restore ecological balance and not profit maximization. In other words, a nonprofit reinvests the money it makes back into its causes and missions instead of dividing profits among its employees or shareholders. The principal sum and subsequent money is obtained by way of

governmental grants or charitable donations. This means, lesser donations have a negative impact on the effectiveness of the NGOs.

The Chesapeake Bay foundation as stated on their web page, is one such organization that works to reduce pollution emissions in the Chesapeake Bay and its rivers and streams. Founded in 1967, the organization aims at educating, advocating and restoring the water quality in the Bay by reduction of toxins and improving oxygen levels.

Given the importance of donations to these organizations as they facilitate functioning, in order to understand human behavior, economists have turned to the method of experimental models used in the physical sciences. Applying a *ceteris paribus* condition, it becomes easier to observe behavioral patterns from different individuals which would otherwise be very difficult. These behavioral traits can be explained by different motives that drive an individuals' decision making. As Orne (1962) points out, the behavior of a subject is a reflection of their perception of the experiment which may differ from the views of the experimenter. Thus, providing context to the experiment may help elicit better responses from participants.

In this major paper, I observe individual behavioral patterns in the context of nonpoint source (NPS) pollution[1] theory with respect to decisions that lead to income

[1] According to Environmental Protection Agency (EPA) 2018, "Nonpoint source pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification. Nonpoint source (NPS) pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters and ground waters."

generation. In the beginning of the experiment collected and owned by Palm-Forster et al., (in press), participants were provided a text about nonpoint source pollution and at the end of the experiment, participants were presented with a donation decision to an organization (The Chesapeake Bay Foundation) who's objective is to address the problem of NPS pollution. In this major paper, I study if an individual in the experimental setting responds to the context provided.

Using the experimental data collected and owned by Palm-Forster et al. (in press), that employs a two-stage laboratory experiment, I observe participant's behavior within a laboratory setting. In the first stage, participants were provided with a set of instructions after which they made management decisions that determined their earnings at the end of the game. In the second stage, participants filled out a short demographic survey after which they chose whether or not to donate to an environmental organization from their respective payout.

First stage management decisions included the choice of a conservation technology or a conventional technology and a management decision that collectively determined a pollution outcome in a nonpoint source pollution game. The take home earnings of a participant comprised of a general income awarded to the individual, net production income resulting from management decisions, minus the cost of a conservation technology when adopted. Choosing to adopt a conservation technology would result in a negative impact on payout by increasing costs of production on the one hand and yield a positive impact on the environment by reducing pollution on the other hand. The donation decision in the second stage of the experiment was a voluntary

payout made from the amount that the participant earned through decisions taken in the first stage of the experiment.

The assumption is that, adopting a conservation technology or reducing the quantity of inputs to production can reduce the level of pollution emitted by the firm. A decision to donate would result in a decrease in total payout to the participant. Hence, participants that are driven by a pure profit motive would maximize their utility by adopting the conventional (free) technology, polluting at a level that maximizes their profits and opting not to donate. However, if a participant chooses decisions that result in low pollution which could be driven by the adoption of the costly conservation technology, and/or chooses to donate, this signals to the experimental investigator a non-profit motive. Rather, the existence of a context driven response. Our goal is to study whether participants in a laboratory setting respond to the context of the experimental setting.

Preliminary estimation results suggest a negative relationship between individual pollution levels and the amount donated at the end of the experiment. Simply put, a participant making decisions to pollute less is more likely to donate more. Further, individuals that received lower earnings were more likely to donate to the Chesapeake Bay Foundation. These results are based a convenient model estimation strategy and need to be verified by future research.

The rest of this paper is structured as follows. The next section covers the literature that has been reviewed in relevance of this study, followed by the theoretical framework and the design of the experiment which was sourced from Palm-Forster et al. (in press). Next, I employ a linear regression technique to estimate the presence of a

context motive which is presented in the results section, followed by a conclusion that includes scope for further improvement.

2. LITERATURE REVIEW

One of the methodological achievements of experimental economics is the ability to create experimental settings that are designed to resemble real world settings with features such as institutional rules, endowments and incentives which are essential in making predictions based on economic theory about behavior (Smith, 1982). When observing an individual's behavior in a laboratory setting, one must therefore consider different aspects that might influence behavioral patterns.

In the following subsections, I first review literature based on behavior in the context of NPS pollution, then I review individuals' donation behavior followed by donation behavior to environmental organizations and lastly, I review literature on the influence of context to behavior in an experiment.

2.1. Individuals' behavior in the context of nonpoint source pollution

The pollution of an individual is difficult to observe with respect to nonpoint pollution problems when observing ambient pollution levels as the pollution levels are based on a random distribution of abatement technologies adopted and only the combined effects are observed. Offering an incentive for total pollution levels can help control for this (Segerson, 1986). In general, with an incentive scheme in play, an individual or firm will start responding to cumulative pollution emissions (Xepapadeas,1992). Employing different treatments including a no policy control, Palm- Forster et al. (in press) controls for this potential problem by imposing penalties for total pollution of a group exceeding a pre-determined limit. Since the current paper utilizes data from Palm-Forster et al. (in press), the issue of observing individual pollution is considered here.

2.2. Individual donation behavior

In the past half century, there has been a large flow of charitable gifts irrespective of economic conditions (List, 2011). Traditionally, a pure altruistic approach would explain motivations to donation (Andreoni, 1989). However, there may be other factors that influence donation such as the feel-good factor or a 'warm-glow' obtained from the act of giving (Andreoni, 1989) or social pressure (Akerlof and Kranton, 2000). The pure altruism model suggests that giving is solely motivated by the output of the charity, but an impure altruistic model looks at the influence of a warm-glow experienced by the donor (Vesterlund et al., 2008). While these explain motivations to donation, an individual may not want to give but may dislike saying no, for example, due to social pressure (DellaVigna et al., 2012). Within a laboratory however, there may be different motivations that drive giving. It could be driven by a profit motive, social pressure or individual perception driven by the context of the experiment. In this study, the social pressure aspect is controlled for by design of the experiment collected and owned by Palm-Forster et al., (in press) wherein participants are ensured complete anonymity. An individual operating with a profit motive would be less likely to donate. However, if decisions are driven by the participants perception or the context of the experiment, the individual would be more likely to donate.

2.3. Donation behavior to environmental organizations

Mazar and Zhong (2010) remark that the recent growth of the market for environmentally friendly products reflects a change in the social and moral values of consumers. Their

studies show that exposure to an environmentally friendly product would result in a more altruistic behavioral pattern. Purchasing choices reflect not only price and quality preferences (Monroe, 1976), but also reflect an individual's beliefs, values and norms (Caruana, 2007). Therefore, in an experiment involving donation to an environmental organization, providing information on the background and mission of the respective organization can increase expose and thereby increase donations.

2.4. Influence of context on participants' behavior in experiments

Contextual factors appear to have a significant impact on actions (Levitt and List, 2007). In a series of experiments conducted by Henrich et al. (2005), it was found that a group of participants receiving identical instructions about the description of the game, payoffs and incentives, responded differently based on the context that the participants themselves brought to the game. An experimental investigator could lack complete control over the entire context within which a decision is made (Harrison and List, 2004). Therefore, providing context can provide a better understanding of a particular environment and reduce confusion among participants. With decisions regarding pollution choices or concerning bribes, contextual instructions could affect behavior in the experiment, but this effect could be desirable as it is related to the research question (Alekseev et al., 2016).

The above literature review reveals significant research on donation behavior and individual's behavior in an experiment. However, there seems to be a gap in the literature addressing motivation to donation observed in experimental settings. Although this paper

is based on the experimental data sourced from Palm-Forster et al. (in press), it differs from and contributes to the existing literature by addressing the gap in the literature considering motivations to individual's donation behavior to an environmental organization within an experiment. In addition to a profit motive, I observe if context of the experiment plays a role in decision making within a laboratory. Results suggest that an individual choosing environmentally friendly decisions and polluting less, is more likely to donate more at the end of the experiment indicating that participants do respond to context.

3. THEORETICAL FRAMEWORK

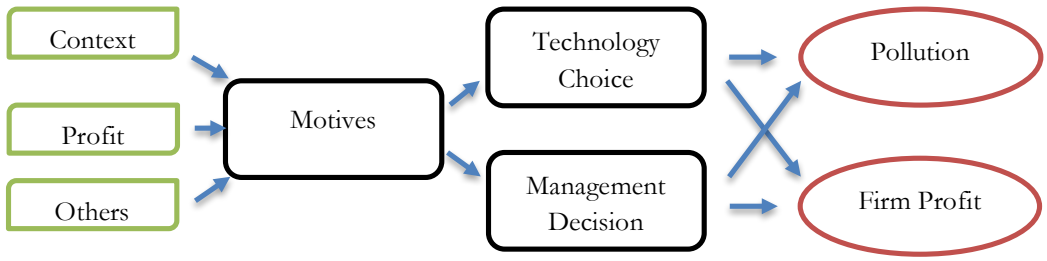

Figure 3.1: Structure of the theory

As shown in figure 3.1, an individuals' behavior within a laboratory setting can be broadly driven by motives such as that of pure profit, the context of the experiment or others such as warm-glow effect or an altruistic approach. With relevance to this study, I consider two motives that impact behavior, namely profit and context. An individual responding to a pure profit motive is found to make decisions that result in higher pollution emissions and solely enhance take home earnings at the end of the experiment. On the other hand, if a participant is responding to the context of the experiment, the decisions arising from this does not increase profit. Rather, it translates to environmentally friendly decisions resulting in low pollution emissions coupled with the choice to donate at the end of the experiment.

Pollution emission is determined by the management decision of the firm as well as the choice of technology. Following Palm-Forster et al. (in press), the firm's profit-maximization problem is given by

$$\max_{xi,ai} \pi(x_i, a_i) = g + b(x_i) - c*a_i \quad (1)$$

Where **g** is the subsidy/government benefit provided to each firm earning a net production income of $\mathbf{b(x_i)}$ with $\mathbf{x_i}$ representing the quantity of inputs used in production. It is assumed that there is no additional cost for the adoption of the conventional technology. Therefore, the cost of adopting the conservation technology is denoted by c, and the charge associated with the choice of technology is denoted by $c*a_i$. From this design, a negative correlation can be expected between the choice of technology adopted and firm profit.

Considering the individuals that decided to donate at the end of the experiment, I observe if their decisions were based on underlying ideas or a consistent profit motive. This is observed by the choices made by the individual in the production process, wherein adopting a conservation technology would have a negative impact on payout by increasing costs of production but a positive impact on the environment by reducing pollution emission. In addition, I observe the existence of a relationship between donations and the level of pollution emitted. These explanations lead to the following two hypotheses:

H1: There is no correlation between individual pollution and donation

In order to test this hypothesis, I estimate the following regression equation.

$$\text{Individual pollution}_{ij} = \beta_0 + \beta_1 \text{donate} + \beta_2 \text{ gender} + \beta_3 \text{ economic classes} + \beta_4 \text{ age} + \beta_5 \text{ international} + \mu_{ij} \quad (2)$$

where individual pollution_{ij} is an outcome determined by the choice of technology adopted by the individual 'i' in round 'j' expressed in unit terms. β_n represents the coefficients of the independent variables. Donate is a dummy variable which takes the binary values of 0 and 1. If a participant chose to donate at the end of the experiment this takes the value of 1 and 0 otherwise. β_2, β_3, β_4 and β_5 represents the coefficients of demographic details such gender, number of economic classes taken, age and whether or not the student is an international candidate. μ_{ij} is the error term of the specification using pooled data. If an individual is responding to the context of the experiment, we expect β_1 to have a negative sign, indicating a negative relationship between donations and individual pollution.

H2: There is no correlation between firm profit and donation

To test the above hypothesis, the following regression equation has been estimated

$$\text{Firm profit}_{ij} = \alpha_0 + \alpha_1 \text{donate} + \alpha_2 \text{ gender} + \alpha_3 \text{ economic classes} + \alpha_4 \text{ age} + \alpha_5 \text{ international} + \varepsilon_{ij} \quad (3)$$

where firm profit_{ij} is an outcome determined by the receipt of subsidy, choice of technology adopted by the individual 'i' in round 'j'. α_n represents the coefficients of the independent variables. Donate is a dummy variable which takes the binary values of 0 and 1. If a participant chose to donate at the end of the experiment this takes the value of

1 and 0 otherwise. α_2, α_3, α_4 and α_5 represents the coefficients of demographic details such gender, number of economic classes taken, age and whether or not the student is an international candidate. ε_{ij} is the error term of the specification using pooled data. If an individual is responding to the context of the experiment, we expect α_1 to have a negative sign.

The above two hypotheses along with the result are tabulated below in table 3.1

Table 3.1: Research hypotheses

Research Question	Null Hypotheses	Test	Result and Interpretation
Are participants in a laboratory experiment responding to the context of the experimental setting and not merely to a profit motive?	$\beta_1 = 0$ (There is no correlation between individual pollution and donation)	$p < 0.01$	Reject. Lower the individual pollution, higher the amount donated
	$\alpha_1 = 0$ (There is no correlation between profits and donation)	$p < 0.01$	Reject. lower the firm profits, higher the amount of donation.

4. EXPERIMENTAL DESIGN

This section of the paper is based on the experimental design and data collected at the University of Delaware by Dr. Palm-Forster, Dr. Messer and Dr. Suter who have kindly granted me permission to analyze this dataset for the purpose of my major paper. Below is a summarized description of their design which is described in more detail in Palm-Forster et al. (in press)[2].

Using the data collected, I observe participant's behavior within the setting of a laboratory experiment collected in the Spring of 2016 at the University of Delaware. A total of 156 undergraduate students were recruited using lists managed by the Department of Economics. The only information provided to participants at this stage was an e-mail stating that they were selected to participate in a study that involved decision-making and would take approximately 90 minutes with an average payout of $30. The minimum and maximum payout to participants at the end of the experiment amounted to $21.50 and $72.75 respectively. Since the average sum per hour was up to $20, this was similar to payments resulting from other experiments such as Fooks et al., (2016), Arnold et al., (2013), Messer et al., (2014) and Suter et al., (2012).

The experiment consisted of six stages in total. In the first stage, participants received audio as well as written instructions about the experiment. In the second stage, they were asked to participate in a practice round which had no implications on the

[2] For finer details please refer to Palm-Forster, L.H., J.F. Suter, and K.D. Messer. *In Press.* "Experimental evidence on policy approaches that link agricultural subsidies to water quality outcomes." *American Journal of Agricultural Economics.* http://dx.doi.org/10.1093/ajae/aay057

payment received. This was to ensure participants understood the details of experiment. In the third stage, individuals took part in the experiment, which was similar to the practice round but decisions from this round had financial implications on profit earned. In the fourth stage, participants took part in an adapted Holt-Laury lottery which helped the experimental investigator gain insight on respective risk preferences. The fifth stage involved a short demographic survey on details such as gender, race, age, number of economic classes taken as well as if the student was a domestic or international candidate. In the final part of the experiment, participants were provided with a short script about the Chesapeake Bay foundation and they were given a choice to donate to the respective organisation. Any donation made was deducted from the total earnings at the end of the experiment.

All of the firms in their group were identical in terms of potential net production income, profits, and pollution relationships. Between each student, there were privacy barriers setup to avoid other participants from viewing an individual's screen. Individuals were randomly assigned to a six-person group that they were unable to identify. This ensured complete anonymity in the responses received.

Each experimental session consisted of four treatments (C1, T2, T3 and T4) with each treatment comprising of five decision rounds. In each of the rounds, participants were given the choice to simultaneously choose between a costly conservation technology or a conventional technology and one of ten management decisions (refer to table:4.1). The choice of the management decision coupled with the technology choice jointly determined the pollution outcome. At the beginning of every round participants were awarded 400 experimental dollars which resembled a subsidy. The cost of the

conservation technology was 150 experimental dollars which was subtracted from the firm's profits for each round of the game when chosen.

The four treatments included a no policy control (C1) in which the choice of a management decision with high levels of pollution had no negative financial implication on the participant. The cost of adopting the conservation technology to reduce pollution was fixed at 150 experimental dollars for every treatment. In the linear tax treatment (T2), if the total pollution of the group exceeded a specified threshold, each firm paid a linear tax for every unit of pollution above the said limit. In the linear subsidy reduction (T3), instead of a linear tax, if the total pollution exceeded the threshold limit, each firm within the group incurred a subsidy reduction for every unit of pollution above the limit. The limit of subsidy reduction was capped at 400 experimental dollars which was the subsidy received at the beginning of each round. T4 was similar to T3 in terms of linear subsidy reduction for total pollution emissions above the limit. However, in this treatment, if a firm adopted the costly conservation technology there was an assurance of no penalty.

After the experiment, individuals participated in an adapted Holt-Laury (2002) risk-elicitation procedure that helped ascertain risk preferences. Participants were then instructed to fill out a short survey that collected demographic data such as gender, age, race, academic major, home state or country and number of economic courses taken.

At the end of the survey, participants were provided a description about an environmental organization as shown in figure 4.1, that comprised of details such as when the organization was founded, what it stands for, and a short note on what it aims at achieving. The organization used in this experiment was the Chesapeake Bay foundation

whose motto is to reduce pollution in the Bay, it's rivers and streams. Students were then given the option to donate to the organization. If an individual opted to donate to the organization, this sum was deducted from the net profits earned at the end of the experiment. The description and donation information provided to all the participants were identical. All decisions were made within privacy barriers to control for a social pressure motive and payout electronically calculated at the end of the experiment. The range of donations were found to range from $0 to $10 with a total of 23 participants choosing to donate.

In the experiment instructions, participants were told that their decisions impacted the level of NPS pollution generated by their firm in the experimental setting. This provided the individual with the context within which the experiment was set. The tasks and decision making that were asked of the participants all linked to this underlying text. By concluding the experiment with a donation decision to a real environmental organisation that works towards mitigating water pollution helps the experimental investigator to analyse if responses are context driven.

Founded in 1967, the **Chesapeake Bay Foundation (CBF)** is the largest independent conservation organization dedicated to reducing water pollution in the Chesapeake Bay and its rivers and streams. The CBF's motto, "Save the Bay," is a call for pollution reduction throughout the Chesapeake's six-state, 64,000-square-mile watershed, which is home to more than 17 million people and 3,000 species of plants and animals.

Would you like to make a donation to the **Chesapeake Bay Foundation?**
(Donations will be collected at the end of the experiment)
◯Yes ◯No

If yes, please indicate the amount you would like to donate to the **Chesapeake Bay Foundation.**
Donation amount (US Dollars): $

Figure 4.1: Screenshot of donation information provided

The take-home final earnings of an individual consisted of the net profits earned through the experiment with $600 experimental dollars equivalent to $1 plus the payout from the risk-elicitation procedure minus the donation.

(Refer to source: Palm-Forster et al. (in press), for finer details on the experimental design.)

Table 4.1: Emissions and Profits related to management decisions

Management Decision	General Earnings	Net Production Income	Technology 1 (Conventional)		Technology 2 (Conservational)	
			Profit	Emissions	Profit	Emissions
A	400	40	440	0.0	290	0.0
B	400	150	550	1.0	400	0.5
C	400	240	640	2.0	490	1.0
D	400	310	710	3.0	560	1.5
E	400	360	760	4.0	610	2.0
F	400	390	790	5.0	640	2.5
G	400	400	800	6.0	650	3.0
H	400	390	790	7.0	640	3.5
I	400	360	760	8.0	610	4.0
J	400	310	710	9.0	560	4.5

Source: Palm-Forster et al. (in press).

5. RESULTS

From the data collected and owned by Palm-Forster et al. (in press), I observe individual behavior within an experimental setting. A participant could either be driven by a pure profit motive and make decisions to stimulate earnings at the end of the experiment or could be influenced by the context of the experiment and make environmentally friendly choices. An individual who adopts the costly conservation technology thereby polluting less, coupled with a decision to donate at the end of the experiment is understood as being responsive to the context of the setting. It is observed that individuals that choose lower pollution levels are more likely to donate. I further analyse the relationship between firm profits and individual pollution. A negative correlation suggests that an individual that earns lower profits from the experiment is more likely to make a donation. It is to be noted that the results from this paper are preliminary and not based on the best available model specifications.

Table 5.1: Summary statistics of key variables

Variable	Description	Mean	Min	Max	Observations
Gender	1 if participant is male, 0 otherwise	0.57	0	1	156
Donate	1 if participant donated, 0 otherwise	0.15	0	1	156
Donate amount	Amount donated at the end of the experiment	0.40	0	10	156
Age	Age of participant	25	19	31	156
International	1 if participant is international, 0 otherwise	0.24	0	1	156
Economics classes	Number of economics classes the participant had taken prior to the current semester	3.28	0	50	156
Lottery winnings	Amount a participant won from the lottery	3.29	0	39	156
Individual pollution	Pollution generated by an individual	5.7	0	9	156
Individual tax	Tax an individual incurred when pollution exceeded the threshold limit	23.9	0	468	156
Firm profit	Amount earned as a result of subsidy received, net production income and choice of technology	722.68	290	800	156

Note: Averages computed by the author. Data taken from Palm-Forster et al. (in press).

From Table 5.1, it is observed that 57% of the participants were male. Out of the 156 participants, 23 individuals donated to the environmental organisation which is approximately 15% of the sample. The average donation amount was $0.4 U.S dollars and the mode of donations among individuals who donated was $2 U.S dollars. Participants were at an average of 25 years old with approximately 24% comprising of international students. On average, participants had taken 3 economics classes. Out of the

156 participants, 26 won the lottery with average winnings summing up to $19.76 U.S dollars. The average individual pollution choices were found to be at 5.7 which is almost at the profit maximizing decision choice as per table 1.1 that lists management choices. The individual tax that a participant incurred when the total pollution in the watershed exceeded a specified limit was found to be 23.9 experimental dollars. Mean individual firm profits calculated as a function of subsidy received, net production income, minus the cost of technology was found to be 722.68 experimental dollars.

Figure 5.1 exhibits the results of the binary choice of donation. Out of 156 participants 15 percent chose to donate at the end of the experiment.

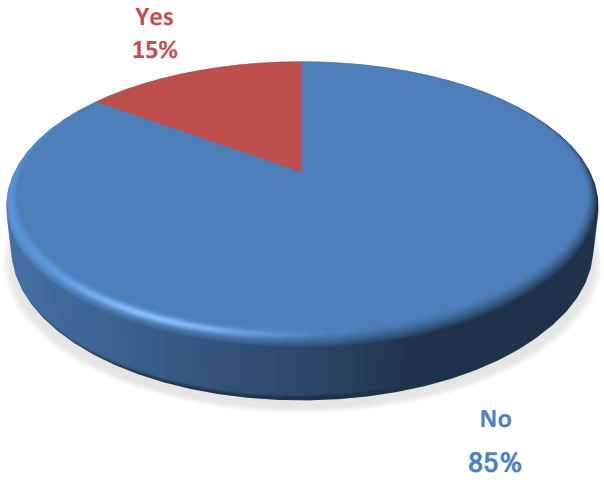

Figure 5.1: Donation choice

Figure 5.2 exhibits the range of donations that participants chose at the end of the experiment. The majority of donations were centered at $0 with 133 participants choosing not to donate. These participants are assumed to be comparatively lesser environmentally friendly compared to the participants that donated. A total of 23 participants were found to donate. From this figure, I find that the mode of donations was at $2.

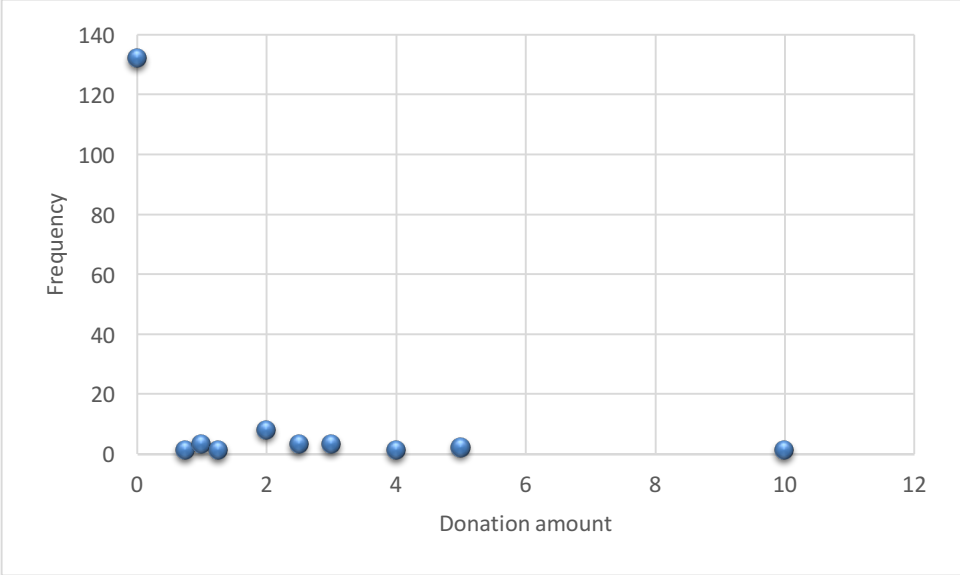

Figure 5.2: Donation amount including 0 donation

Figure 5.3 exhibits the distribution in the individual pollution levels. From this figure, I find that a majority of participants chose to pollute at 3. The second highest pollution choice is seen to at 6 which the level of pollution at the highest profit level.

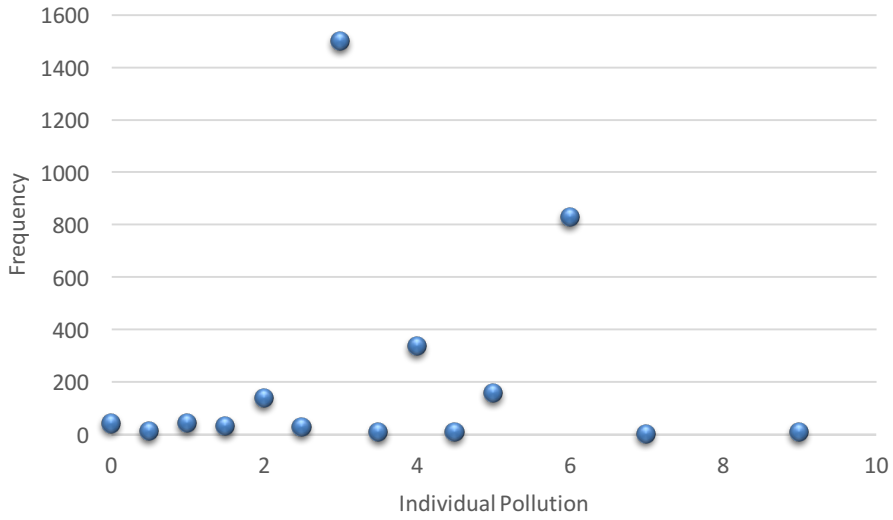

Figure 5.3: Individual pollution

Figure 5.4 shows the distribution of technology adoption between participants including T4 wherein the adoption of the technology resulted in a no penalty on subsidy irrespective of pollution emission in the watershed. Out of a total of 3120 observations, the costly conservation technology was adopted 533 times.

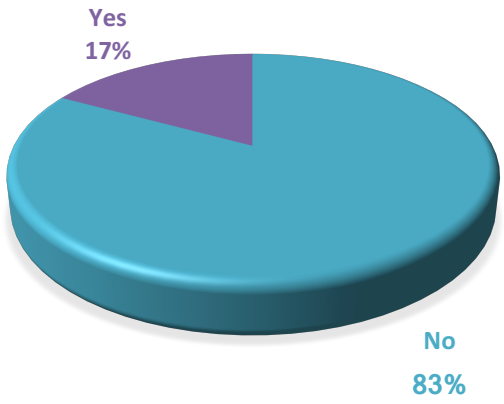

Figure 5.4: Technology choice including T4

Figure 5.5 exhibits the choice of technology in C1 exclusively. In this treatment, a higher pollution choice had no financial penalty. Individuals who adopted the expensive conservation technology in this no policy treatment round are assumed to be more environmentally friendly. The conservation technology was chosen 21 times out of 780 observations.

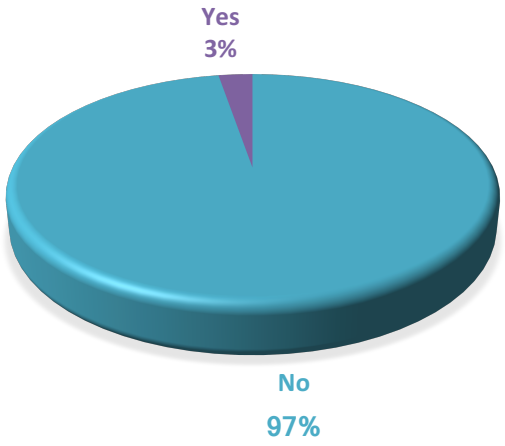

Figure 5.5: Technology choice C1

5.1. Linear Least Squares Regression Estimation

Although each individual participated in 20 rounds in the experiment, resulting in a panel structure for the data, this paper does not account for either random of fixed effects. A linear least squares regression using pooled data attempts to model the relationship between two variables by fitting a linear equation to observed data points. One variable is considered to be a dependent variable and the other is considered an explanatory variable. Here I do not necessarily observe a causal relationship but rather a correlation between the dependent and independent variables.

To test the first hypothesis, I observe the relationship between individual pollution and donation amount. Represented in equation (2), the firm's individual pollution is the dependent variable and the donation amount is the explanatory variable. A negative coefficient of the independent variable or donation amount indicates a negative relationship between the dependent (individual pollution) and the independent variable (donation amount). In other words, as the individual pollution decreases, one can expect the donation amount to increase.

To test the second hypothesis, I observe the relationship between firm profits and donation amount. In this estimation, the firm profit is considered as the dependent variable and the donation amount as the independent variable. A negative correlation indicates lower the firm profits, higher the donation amount.

The estimation results from running a linear regression are summarized in table 5.1.1 and table 5.1.2.

Table: 5.1.1: Linear least squares regression estimation to test the correlation between individual pollution and donation

Variable (Dependent variable = individual pollution)	**Coefficients**	
	(A)	**(B)**
Donation amount	-.0511***	-.0595***
	(0.0161)	(.0162)
T2	-2.4568***	-2.4568***
	(.0549)	(.0544)
T3	-2.4213***	-2.4213***
	(.0549)	(.0544)
T4	-2.3581***	
	(.0549)	
Gender	-	.1787***
		(.0303)
Economic classes	-	.0010***
		(.0002)
Age	-	-.0001**
		(.0000)
International	-	-.1797***
		(.0302)
Intercept	5.7183***	5.774***
	(.03935)	(.0687)
Observations	3100	3100
***F* statistic**	726.93	377.30
***R* squared**	0.48	0.49

Note: Numbers in the parentheses are standard errors. *** 1% significance ** 5% significance * 10% significance

From the above estimation results using the no policy control (C1) as the baseline I observe the correlation between individual pollution and donation amount. In specification (A), I find a statistically significant negative correlation between individual pollution and donation amount. This indicates that an individual making decisions that result in a low pollution level is more likely to donate more at the end of the experiment. For every 1 dollar increase in donation, individual pollution decreased by 0.05 units. As compared to the no policy control (C1), individuals in the treatments T2, T3 and T4 are found to be polluting less as shown by the negative signs of the estimated coefficients of

T2, T3 and T4 respectively. These coefficients are significant at the 1 percent level. Forty eight percent of the variation in individual pollution is explained by specification A.

Controlling for demographic variables such as respondent's age, gender, number of economic classes taken and if the student is international, I estimate the correlation between individual pollution and donation amount in specification (B). Comparing specification A and B, the negative sign is consistent. Here, for every 1 dollar increase in donation, individual pollution decreases by 0.06 units. Forty nine percent of the variation in individual pollution is explained by specification B. I thus find a 1 percent increase in the R squared value which can be explained by addition of the demographic variables. From the demographic variables, I find a positive correlation in gender and economic classes to individual pollution. Men were more likely to choose higher levels of pollution and also, the higher the number of economic classes taken, the more likely is the individual to choose a higher pollution choice. On the other hand, older and international students were more likely to choose lower pollution levels.

Consistent with (A), the correlation between individual pollution and donation amount is found to be statistically significant and negative with an increase in magnitude. This negative correlation suggests that lower pollution level choices are likely to be followed by higher donation amounts. I further test this using our second hypothesis using firm profits as the dependant variable and donation amount as the explanatory variable. The results are summarized in table 5.1.2.

Table 5.1.2: Linear least squares regression estimation to test the correlation between firm profits and donation

Variable (Dependent variable = firm profit)	Coefficients	
	(A)	**(B)**
Donation amount	-2.6872***	-3.1226***
	(.9217)	(.9260)
T2	-82.1678***	-82.1677***
	(3.1372)	(3.1132)
T3	-79.3032***	-79.3032***
	(3.1372)	(3.1132)
T4	-101.4968***	-101.4968***
	(3.1372)	(3.1132)
Gender	-	9.4197***
		(1.7306)
Economic classes	-	.0560***
		(.0138)
Age	-	-.0029*
		(.0016)
International	-	-9.4729***
		(1.7289)
Intercept	789.4275***	791.5393***
	(2.2483)	(3.9299)
Observations	3100	3100
***F* statistic**	309.68	163.73
***R* squared**	0.28	0.30

Note: Numbers in the parentheses are standard errors. *** 1% significance ** 5% significance * 10% significance

Similar to table 5.1.1, using the no policy control (C1) as the baseline I observe the correlation between firm profits and donation amount. In specification (A), I find a statistically significant negative correlation between profits and donation amount. This indicates that an individual making decisions that results in low take-home earnings is more likely to donate more at the end of the experiment. For every 1 dollar increase in donation, profits decreased by 2.69 experimental dollars. As compared to the no policy control (C1), individuals in the treatments T2, T3 and T4 are found to be earning less

profits as shown by the negative signs of the estimated coefficients of T2, T3 and T4 respectively. These coefficients are significant at the 1 percent level. Twenty eight percent of the variation in individual profits is explained by specification A.

Controlling for demographic variables such as respondent's age, gender, number of economic classes taken and if the student is international, I estimate the correlation between firm profits and donation amount in specification (B). Comparing specifications A and B, the negative sign is consistent. Here, for every 1 dollar increase in donation, profits decrease by 3.12 experimental dollars. Thirty percent of the variation in individual profits is explained by specification B. I thus find a two percent increase in the R squared value which can be explained by addition of the demographic variables. From the demographic variables, I find a positive correlation in gender and economic classes to profits earned. Men were more likely to make profit maximizing decisions and also, the higher the number of economic classes taken, the more likely is the individual to earn a higher profit. On the other hand, older and international students were more likely to earn less. Consistent with (A), the correlation between firm profits and donation amount is found to be statistically significant and negative with an increase in magnitude. This negative correlation suggests that decisions leading to a lower profit are likely to be followed by higher donation amounts.

From table 5.1.1 I find the individuals choosing lower pollution levels were more likely to donate at the end of experiment. Further, from table 5.1.2, participants earning lower profits were also more likely to donate to the Chesapeake Bay Foundation. This suggests that context does influence an individual's behavior in an experimental setting.

6. CONCLUSION

Context in an experiment can influence participants behavior. When observing an individual's behavior within a laboratory setting, it may be noteworthy to consider different aspects that could influence behavioral patterns. In this paper, I study whether behavior is influenced by a pure profit motive or driven by the context of the experimental setting employing the two-stage laboratory experiment of Palm-Forster et al. (in press). In the first stage an individual's behavior is observed through decisions involving a choice of a technology to be adopted as well as a management choice which jointly determined pollution levels. In the second stage, participants filled out a short demographic survey after which they made a donation decision to the Chesapeake Bay foundation. The take home earnings of a participant comprised of a general income awarded to the individual, net production income resulting from management decisions, minus the choice of a conservation technology where adopted, and donations.

Although the experiment consists of 20 rounds, resulting in a panel structure for the data, this paper does not account for individually specific effects. Instead, a convenient estimation strategy that uses pooled data is adopted in the analysis. From the estimation results, a negative correlation between individual pollution and donation is found, suggesting that participants who polluted less were more likely to donate. Examining this relationship with respect to firm profits, it was observed that lower firm profits were correlated with larger donation sums. This negative correlation between individuals who earned less and donating more, suggests the existence of a context driven response. Note that these effects are subject to change once the panel data structure is accounted for. Thus, the results presented here are not ready to be cited. Improving upon

this paper, varying the context of the experimental setting can elicit varying responses driven by a pure change in context. Further, context might also help in replicating results across cultures, languages and populations in which contextual instructions might have a different meaning.

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