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# ABSTRACT

# To What Do People Contribute? Ongoing Operations vs. Sustainable Supplies*

We study how the objective of the contributions affects the willingness to contribute to real-life public goods. We conducted three treatments of a fundraising experiment among religious Jewish students in which the contributions were assigned to finance sustainable supplies and the ongoing operations of their campus synagogue. In each treatment, we informed the subject of the different allocation of their contributions between funding sustainable supplies and ongoing operations. The results show that contributions increase significantly with the share of contributions assigned to the procurement of sustainable supplies. We use the results to derive practical implications for the design of fundraising for public goods.

| **JEL Classification:** | C73, C91, C92, H41 |
| --- | --- |
| **Keywords:** | experiment, Nash equilibrium, public goods, voluntary provision |

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## 1. Introduction

Throughout history, people, especially in small communities, have relied on voluntary contributions and charitable giving to finance public goods. The necessity to cooperate for survival made altruism an innate human characteristic that emerges early in childhood (List & Samak, 2013). The motivation for charitable giving may originate from pure altruism, the genuine concern for others (Bergstrom, Blume, & Varian, 1986; Roberts, 1984; Warr, 1982); the desire to gain prestige (Olson, 1965); or social pressure (Arbel et al. 2016; Dellavigna, List, & Malmendier, 2012). Charitable giving may also be motivated by a personal gain (Becker, 1974) or "warm glow," the utility gained by the contributor from the act of giving (Andreoni, 1989, 1990).

Institutions (e.g., hospitals or universities) frequently raise funds to construct buildings and subsequently face difficulties financing their maintenance and ongoing operations. In this paper, we study the effect of the objective of contributions on the willingness of donors to contribute to a real-life public good. We conducted a fundraising experiment in which religious students from the Jerusalem College of Technology (JCT)[1] were asked to contribute to their campus synagogue, a public good they use for their daily prayer whenever they are present on campus.[2]

In each treatment, subjects were handed an initial endowment of tokens to be divided between themselves and a contribution to their campus synagogues. It is important to note that there is *no* religious obligation to donate to synagogues. The Jewish religious obligation is to help the poor by tithing 10% of income and not to donate to religious institutions.

In the first treatment, we asked the subjects to divide their initial endowment between private consumption and contribution for the ongoing operations of the campus synagogue (e.g., cleaning, electricity bills, food, and beverages). In the second treatment, we asked the subjects to divide their initial endowment between private consumption and contribution for procurement of sustainable supplies for the campus synagogue (e.g., prayer books, religious books). We also informed the subjects that

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[1] The JCT is a Jewish Orthodox religious institution that combines academic studies and Jewish religious studies. Orthodox Judaism adheres to the interpretation and application of the laws in the Torah as interpreted in the Talmud (the "Oral Law") and further developed and applied by later authorities. The differences between Orthodox and ultra-Orthodox Judaism relate primarily to religious attitude and evaluation of modernity and Zionism and are, therefore, irrelevant to this study.

[2] The Jewish religion obligates males to observe three daily prayers (females have to pray at least once a day) and highly recommends public prayers within a synagogue with at least 10 participants.

20% of their contribution would be assigned to finance the ongoing operations of the campus synagogue. In the third treatment, we informed the subjects that 100% of their contributions would be used to procure sustainable supplies for their campus synagogue.[3] By controlling for The experimental design proposed fundraising experiment is closely captured by a simple theoretical framework used to model contributions for the procurement of sustainable supplies and ongoing operations of public goods.

The differences between the three treatments elicit the effect of the objective of the contributions. In other words, if the subject were interested only is the contribution alone, we would not observe any difference between the three treatments. Therefore, the significant increase in contributions in response to a modification of the objective of the contributions from ongoing operations to the procurement of sustainable supplies may indicate that the subjects prefer to contribute to durables rather than ongoing operations.

Regression outcomes show, controlling for socioeconomic characteristics, that the average contribution significantly rises with the share of contributions assigned to the procurement of sustainable supplies for the campus synagogue.

The remainder of the paper is organized as follows. Section 2 provides a literature review. Section 3 presents the theoretical framework. Section 4 describes the experimental design. The results of the experiment are presented in section 5. Section 6 concludes and summarizes.

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[3] Note that unlike Gneezy et al. (2014), who used some donations to cover overhead expenses, all the contributions in our experiment were utilized to procure supplies for the campus synagogue.

## 2. Literature Review

Our results provide evidence that individuals are more willing to contribute to durable goods rather than ongoing operations. One possible explanation is the "warm glow" effect, the private extra benefit or reward experienced by the contributor from the act of giving, associated with contributions to durables. The warm glow effect is considered one of the primary motivators for contributing because it creates a positive externality (Andreoni, 1989, 1995; Konow, 2010; Park, 2000), particularly for females (Tonin & Vlassopoulos, 2010). Indeed, laboratory experiments found evidence of a warm-glow effect in charitable giving, expressed by incomplete crowding out of private contributions made by a third party. That is, individual $i$ reduces his contribution by less than \$1 in response to a \$1 increase in the contribution made by a third party that is financed by a lump-sum tax levied on individual $i$ (Andreoni, 1993; Bolton & Katok, 1998; Crumpler & Grossman, 2008; Eckel, Grossman, & Johnston, 2005; Gronberg, Luccasen, Turocy, & Van Huyck, 2012). Nonetheless, other researchers (Goeree et al., 2002; Palfrey & Prisbrey, 1997) found experimental evidence of the existence of pure altruism (demonstrated by complete crowding out of private contributions by a third party) in charitable giving. The extent of the crowding out was found to depend on the charity's output (Ottoni-Wilhelm, Vesterlund, & Xie, 2017; Ribar & Wilhelm, 2002; Yildirim, 2014).

Several studies examined methods to increase charity giving. For example, charitable giving was found to increase with group size (Isaac & Walker, 1988; Zhang & Zhu, 2011) and following a request to donate (Andreoni, Rao, & Trachtman, 2017). Government grants crowd out charity, mainly by reducing the effort to raise funds (Andreoni & Payne, 2011). Also, government grants have a positive effect on small charities (Andreoni, Payne, & Smith, 2014). Huck et al. (2015), Huck and Rasul (2011) explored the effect of different treatments, such as equal matching for each donated sum and having a lead donor, on the level of donations. They found that total contributions increase with linear matching, although the matching partially crowds out contributions. They concluded that charitable organizations should maximize donations by announcing the presence of a lead gift, even if it does not exist. Gneezy et al. (2014) found evidence that contributions decrease in response to an increase in the overhead expenses associated with fundraising. They also showed that the presence of a lead donor, which covers the overhead expenses, increases contributions.

In the presence of overhead expenses, one's contributions become less effective. Indeed, Gee and Schreck (2018) found that contributions increase when contributors feel their contributions are more effective. They conducted an experiment in which reaching a threshold level of contributions secured matching and showed that this treatment more than doubled contributions. The effectiveness of contribution is also expressed by recognition. Brock, Lange, & Ozbay (2017) and Krawczyk & Le Lec (2010) showed that people reduce their contributions in the presence of a risk that their contribution will be less effective, and even use this risk as an excuse to avoid contributing (Exley, 2015). Recognizing the importance of the contribution also affects its size. Samek & Sheremeta (2017) showed that recognition in the form of announcing the highest donors increased contributions.

Unlike charity, contribution to a public good is expected to *rise* with higher intensity of use. Arbel, Bar-El, & Tobol (2016) conducted a five-round contribution experiment among religious and secular students, in which contributions were dedicated to the procurement of sustainable supplies for their campus synagogues. They showed that the average contribution increases with the level of utilization in the public good (number of visits to the campus synagogues), whether information about contributions made by other subjects was provided or not. Unlike Arbel *et al.* (2016), the current study focuses on the effect of the objective of contributions, rather than the intensity of use, on the willingness to contribute.

## 3.    Theory and Background

Following Becker (1974), Bergstrom et al. (1986), Andreoni (1990, 1989) and Ottoni-Wilhelm et al., (2017), we review the impure altruism models and demonstrate the effect of the objective of the contributions on the willingness to contribute.

A pure altruist derives utility $U^i(c_i, G)$ from his private consumption, $c_i$, and the charity's output, $G$. We assume that the utility function is strictly quasi-concave. Normalizing price, individual $i$'s budget constraint is $c_i + g_i \leq w_i$, where $g_i$ denotes her contribution to the public good and $w_i$ denotes her income. The charity's output equals the sum of contributions made by all individuals, that is, the sum of contributions made by individual $i$ and the all other individuals excluding individual $i$,

$G = \sum_{i=1}^{n} g_i = g_i + \sum_{j \neq i} g_j = g_i + G_{-i}$. Under the Nash assumption $G_{-i}$ as is treated as exogenous. By substituting $c_i = w_i - g_i$ and $g_i = G - G_{-i}$, the utility function of individual $i$ becomes $U^i(w_i - G + G_{-i}, G - G_{-i})$. Differentiating the utility function with respect to $G$ and solving, yields the preferred contribution of the pure altruist as a function of the exogenous variables: $g_i^* = G^* - G_{-i} = q^i(w_i + G_{-i}) - G_{-i}$. An increase in the level of contribution by other individuals, $G_{-i}$, financed by a lump-sum tax levied on individual $i$ (such that $dG_{-i} = -dw_i$) does not change the preferred charity's output but only its composition. That is, individual $i$ decreases her contribution by $dG_{-i}$. Therefore, a complete crowd-out is predicted for a pure altruist, or $\left. \frac{dg_i^*}{dG_{-i}} \right|_{dw_i = -dG_{-i}} = -1$.

An impure altruist derives utility also from the act of giving, that is, the utility of the impure altruist is defined by $U^i(c_i, G, g_i)$, a strictly quasi-concave function. By substituting $c_i = w_i - g_i$ and $g_i = G - G_{-i}$ into the utility function and maximizing over $G$, we obtain the preferred contribution of the impure altruist: $g_i^* = G^* - G_{-i} = f^i(w_i + G_{-i}, G_{-i}) - G_{-i}$ where the first argument of $f^i$ comes from the public good dimension of the utility function and the second argument from the private good dimension. That is, individual $i$'s preferred charity's output, $G^*$, is a function of his social income, $w_i + G_{-i}$,[4] and the sum of contributions made by all individuals excluding individual $i$, $G_{-i}$. An increase of \$1 in $G_{-i}$ that is financed by a lump sum tax levied on individual $i$, reduces the contribution of individual $i$ by less that one-to-one if private consumption and warm glow are normal goods. The first argument of $f^i$ remains unchanged and therefore $f_1^i = 0$. The derivative of $f^i$ with respect to the second argument, $f_2^i$, is positive since both private consumption and warm glow decrease in response to the \$1 tax. Hence, $\left. \frac{dg_i^*}{dG_{-i}} \right|_{dw_i = -dG_{-i}} = f_2^i - 1 > -1$.

Furthermore, if $0 < f_1^i + f_2^i \leq 1$ the Nash equilibrium is unique and stable (Andreoni, 1990).

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[4] The term 'social income' is due to Becker (1974).

Therefore, if individuals are impure altruists, we expect their contributions at the Nash equilibrium to be higher compared to pure altruists.

In this paper, we study how the effectiveness of the contribution, as perceived by the donor, affects his contribution.

In the context of our discussion, the charity's output is allocated between a contribution to the procurement of sustainable supplies for the public good and a contribution to the ongoing operations of the public good. We assume that only contributions to sustainable supplies create a warm glow effect. The share of contributions that is assigned to the procurement of sustainable supplies for the public good is denoted by $\theta$ and $(1-\theta)$ is the share of contributions that is assigned to finance the ongoing operations of the public good.

Assume that the utility of individual $i$ is defined by a continuous and quasi-concave utility function $U^i\left(c_i, G, g_i(\theta)\right)$ where $0 \le \theta \le 1$. We also assume that $U^i_{g_i}\big|_{\theta=0} = 0$ and $U^i_{g_i,\theta}\big|_{0<\theta\le1} > 0$. That is, for $\theta = 0$ individual $i$ is a pure altruist and the marginal utility from the act of giving, namely, the warm glow effect, increases with $\theta$. The preferred contribution function of individual $i$ is $g_i^* = G^* - G_{-i} = h^i\left(w_i + G_{-i}, G_{-i}, \theta\right) - G_{-i}$ where $h_3^i > 0$. That is, an increase in $\theta$ leads to an increase in the contribution of individual $i$ for every given $G_{-i}$ and a higher contribution at the Nash equilibrium.

To demonstrate the effect of $\theta$, consider the following example: $n$ identical individuals are asked to contribute to a sustainable public good and the ongoing operations of the public good. Each individual $i$ is endowed with an income $w$ and derives utility from private consumption $(c_i)$ and a public good, $G$. The public good has two characteristics: its level, which is a durable good, and the level of its ongoing operations. Also, we assume that individuals derive an additional utility ("warm glow") from the contributions assigned to increase the level of the public good.

Each individual $i$ decides on the allocation of his endowment between private consumption and contribution to a public good. The contribution to the public good is divided into a contribution to a durable public good (a fixed proportion $\theta$, $0 \le \theta \le 1$ ) and a contribution to its ongoing operations ($1-\theta$).

The public good is financed through voluntary contributions,

$$G = g_i + G_{-i},$$ (1)

where $g_i$ is the contribution of individual $i$ and $G_{-i}$ denotes the total contributions made by all individuals, excluding individual $i$.

The private consumption of individual $i$ equals his endowment, net of his contribution to the public good,

$$c_i = w - g_i.$$ (2)

The utility of individual $i$, $U^i(c_i, G, g_i(\theta))$, is defined over his private consumption, the level of public good, and his contribution to the durable public good. We use equations (1) and (2), and assume that the utility function takes the following functional form:

$$u^i(g_i) = \alpha \ln(w - g_i) + \beta_i \ln(g_i + G_{-i}) + \gamma \theta \ln(g_i),$$ (3)

where $\alpha, \beta_i, \gamma$ $(\alpha, \beta_i, \gamma > 0)$ capture the importance attributed by individual $i$ to his private consumption, public consumption, and his contribution to the durable public good, respectively.[5]

Each individual chooses his contribution to the public good $(g_i)$ to maximize (3). The first order condition is

$$\frac{\partial u_i}{\partial g_i} = -\frac{\alpha}{w - g_i} + \frac{\beta_i}{g_i + G_{-i}} + \frac{\gamma \theta}{g_i} = 0.$$ (4)

Using equation (4), we numerically solve the model for different values of $G_{-i}$ (reflecting differences between individuals in the importance they attribute to the public good) and $\theta$.

Figure 1 displays the optimal contribution of individual $i$ as a function of the total contributions made by all individuals, excluding individual $i$, $G_{-i}$, the share of contributions that is assigned to finance the durable public good, $\theta$, and given that $w = 100, \alpha = \beta_i = \gamma = 0.5$:

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[5] Note that individuals may differ in the importance they attribute to the public good.

**Figure 1:** The contribution of individual $i$ ($g_i$) as a function of the contributions made by all other individuals excluding individual $i$ ($G_{-i}$), and the share of contributions dedicated to financing the durable public good $(\theta)$.
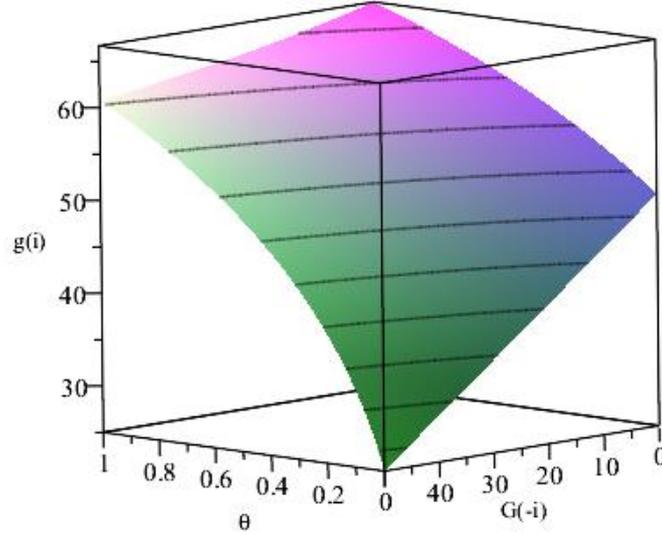


Figure 1 shows that the contribution of individual $i$ $(g_i)$ increases with the share of contributions that are designated to the durable public good $(\theta)$ and decreases with the total contribution of all individuals, excluding individual $i$ $(G_{-i})$. Thus, the extent of the crowding out does not solely depend on the individual's endowment and the contributions made by others (e.g., for example Bolton & Katok, 1998; Ottoni-Wilhelm et al., 2017) but also on the share of contributions that was pre-designated to the durable public good, as this share directly affects the individual's utility.

To analytically solve the model, we assume that all individuals are identical, namely, $\beta_i = \beta \; \forall \, i \in [1, n]$.

From equation (4), we obtain the contribution of a representative individual at the Nash equilibrium:

$$g^{NE} = \frac{\theta(\gamma n\theta + \beta)}{n(\gamma\theta + \alpha) + \beta} w.$$

(5)

By differentiating (5) with respect to $\theta$, we obtain that in equilibrium, the contribution increases with the share of the endowment pre-assigned to the durable public good:

$$\frac{\partial g^{NE}}{\partial \theta} = \frac{\alpha \gamma n^2 w}{\left(n(\gamma\theta + \alpha) + \beta\right)^2} > 0 \,. \tag{6}$$

The theoretical model predicts that if contributions for sustainable public goods create warm glow while contributions to ongoing operations do not, then the contributions for a public good increase with the share of contributions dedicated to the procurement of the sustainable public goods. In the next section, we introduce an experiment designed to capture the effect of the contributions objective on the willingness to contribute.

## 4. Experimental Design and Procedures

We conducted the experiment at the two campuses of the Jerusalem College of Technology (JCT) in Jerusalem, an academic Jewish Orthodox religious institution that combines academic studies and Jewish religious studies. The JCT implements a strict separation of genders with geographically separated campuses for males and females. Each campus has a synagogue that is utilized by the students for their daily prayers, religious studies, and other religious activities and ceremonies.

We sampled 144 undergraduate students, both female and male, and randomly assigned each participant to only one of the sessions.[6] Unlike common practice in the relevant experimental literature, subjects were asked in each treatment to contribute to a *real* public good—their campus synagogues, a public good they use whenever present on the campus for their daily prayers and religion studies.

The use of the campus synagogue as the objective for contributions has several advantages. First, like many religious institutions around the world, synagogues raise funds to finance their budget, particularly on holidays and other occasions when a large prayer crowd is present. Therefore, it is likely that the subjects are familiar with this custom and probably have a prior position as to what extent they should contribute.

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[6] Fehr & List (2004) showed that the use of students as subjects in experiments, particularly in those that involve giving, can be an advantage since small payments are significant for them due to their low income.

However, it is important to note that there is ***no*** religious obligation to donate to synagogues. Second, synagogues require sustainable supplies that can increase the number of individuals who can pray and study, as well as consumable supplies that enable beneficial use of the synagogue. Therefore, the experiment confronts the subjects with familiar decisions and enables an approximation of real-life behavior.

The experiment provides a strong incentive to free ride: As part of the campus, the academic institution finances the synagogues. Therefore, the tuition fee that students pay to the JCT may discourage any voluntary contribution to an institutional facility. Moreover, the contributions were raised for an already existing public good. Finally, the contributions were anonymous.

The experiment was divided into three treatments that were conducted simultaneously at the two campuses of the JCT. In each treatment, we handed 500 tokens to each subject, where one token is equivalent to 0.1 NIS (or approximately 0.25 USD), and asked them to allocate their endowment between private consumption and contribution to the campus synagogue under varying terms.

*Treatment 1:*

Treatment 1 was a single-round contribution game in which the contributions were dedicated to financing the ongoing operations of the campus synagogue (e.g., cleaning, electricity bills, food, and beverages). The treatment was divided into two sessions. The first session included 24 female students and the second included 24 male students. Overall, 48 students participated in treatment 1.

*Treatment 2:*

Treatment 2 was a single-round contribution game in which the contributions were dedicated to the procurement of sustainable supplies for the campus synagogue. Unlike treatment 1, we informed the subjects that only 80% of their contributions would be assigned to finance the procurement of sustainable supplies for the campus synagogue (e.g., prayer books and religious books) and the remaining 20% would be assigned to finance its ongoing operations. The treatment was divided into two sessions: the first included 24 females and the second included 24 males. Overall, 48 students participated in treatment 2.

*Treatment 3:*

Treatment 3 was a single-round contribution game in which all contributions were dedicated to the procurement of sustainable supplies for the campus synagogue. We conducted two sessions: the first included 24 females and the second included 24 males. Overall, 48 students participated in treatment 3.

Recruitment of subjects for the experiment was held on a voluntary basis. Two days before the actual experiment, notices were posted around the two campuses, stating that participation is on a voluntary basis and that subjects will be paid for participation.

The experiments took place at the campus computer labs using Google Docs and a calculator. After being seated in front of a computer terminal, each subject received an experiment identification number to ensure complete anonymity and written instructions for the specific experiment the student was attending (all subjects in a specific session participated in the same experiment). The participants were asked to read the instructions and follow along as these instructions were also read aloud by the experimenter. Understanding the instructions to the specific treatment was ensured by a control questionnaire the subjects had to answer before the experiment started.[7] The subjects were then given a written version of the questionnaire with marked correct answers. The answers were carefully reviewed before proceeding to the actual experiment.

After concluding the experiment, each subject filled out a socioeconomic questionnaire.[8] After filling out the questionnaire, the subject was handed a voucher to be privately exchanged for the actual payment. After receiving the payment voucher, the subject left the experiment area to prevent any contact with other subjects.[9] After completing the experiment, a representative of the student association divided the contributions into contributions for the procurement of sustainable supplies and contributions for ongoing operations and transferred the contributions to the relevant campus synagogue.[10]

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[7] See instructions and control questionnaires in the appendix.

[8] See Table 2 for the descriptive statistics based on the questionnaire.

[9] We ensured that the subjects had no previous acquaintance with the experimenters by recruiting the experimenters outside the JCT.

[10] For example, a subject who contributed 50 tokens was left with 450 tokens that were converted to 45 NIS.

## 5.  Results

*5.1  General Results*

Table 1 displays the results of the experiment separated by treatment and gender, as well as the results of the *t* and Wilcoxon-Mann-Whitney (WMW) tests.[11] The results clearly show that contributions increase with the share dedicated to financing the durable public good.

The average total contribution in treatment 1 is lower than the average total contribution in treatments 2 and 3 (50 tokens compared with 170.31 tokens and 199.02 tokens, respectively, with the differences significant at the 1% significance level). This result is also preserved when separated by gender.

In addition, a Kolmogorov-Smirnov test rejects the null hypothesis that the distributions of contributions to the public good in treatments 1 and 3 are not different at the 1% significance level (*D*, the maximum cumulative probability difference between the two distributions, equals 0.71).

The results also show that the average total contribution in treatment 2 is lower by 28.71 tokens than in treatment 3, although the difference is not statistically significant. When separated by gender, the difference between the average contribution of females in treatments 2 (211.875 tokens) and 3 (252.75 tokens) becomes marginally significant (significant at the 10% significance level).

Moreover, the results show that in all treatments, females contribute significantly more than males (significant at the 1% significance level).

*5.2.  Regression Analysis*

We further analyze the results by using regressions and controlling for socioeconomic differences among subjects.

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[11] Recall that the treatments are separated by gender because the JCT separates campuses by gender.

**Table 1:** Average contributions to the campus synagogue by treatment

| The objective of Contributions: | Contribution for the ongoing operations of the campus synagogue | 80% of the contributions are assigned to the procurement of sustainable supplies for the campus synagogue, 20% of the contributions are assigned to finance the ongoing operations of the campus synagogue. | Procurement of sustainable supplies for the campus synagogue. |
|---|---|---|---|
| | Treatment 1: | Treatment 2: | Treatment 3: |
| **The entire group:** | 50.00 (31.89) | 170.31 (13.43) | 199.02 (18.56) |
| The difference compared with Treatment 1 | - | 120.31*** (14.19) [7.57] | 149.02*** (19.13) [6.5] |
| The difference compared with Treatment 2 | - | - | 28.71 (22.91) [0.93] |
| Observations | 48 | 48 | 48 |
| | | | |
| **Session 1 (Females):** | 67.92 (6.08) | 211.875 (20.73) | 252.75 (26.63) |
| Difference compared with Treatment 1 | - | 143.96*** (21.6) [5.6] | 184.83*** (27.31) [5.29] |
| Difference compared with Treatment 2 | - | - | 40.87* (33.75) [0.98] |
| Observations | 24 | 24 | 24 |
| | | | |
| **Session 2 (Males):** | 32.08 (4.66) | 128.75 (12.53) | 145.29 (21.17) |
| The difference compared with Treatment 1 | - | 96.66*** (13.37) [5.71] | 113.21*** (21.68) [4.44] |
| The difference compared with Treatment 2 | - | - | 16.54 (24.6) [0.32] |
| Observations | 24 | 24 | 24 |
| **Female-Male Difference** | 35.84*** (7.66) [3.7] | 83.13*** (24.22) [3.28] | 107.46*** (34.02) [2.82] |

Notes: Standard errors are given in round parentheses. The degree of freedom in the *t-test* equals to (n-2), where n is the total number of observations. The calculated *z-statistics* of the Wilcoxon–Mann–Whitney test are given in square parenthesis.

* significantly different from zero at the 10% significance level according to a *t-test* and a Wilcoxon–Mann–Whitney test.

** significantly different from zero at the 5% significance level according to a *t-test* and a Wilcoxon–Mann–Whitney test.

*** significantly different from zero at the 1% significance level according to a *t-test* and a Wilcoxon–Mann–Whitney test.

### 5.2.1 Descriptive Statistics

Table 2 reports the descriptive statistics of dummy variables for the three treatments and the socioeconomic control variables.

**Table 2:** Descriptive Statistics of Socioeconomic Variables

| Variable | Description of variables | Obs. | Mean | STD | Min | Max |
|---|---|---|---|---|---|---|
| TREATMENT1 | 1= first treatment (ongoing operations of the campus synagogue); 0=otherwise | 144 | 0.3333 | 0.4730 | 0 | 1 |
| TREATMENT2_3 | 1= second and third treatment (80%-100% assigned to sustainable supplies); 0=otherwise | 144 | 0.6667 | 0.4730 | 0 | 1 |
| TREATMENT3 | 1= third treatment (100% assigned to sustainable supplies); 0=otherwise | 144 | 0.3333 | 0.4730 | 0 | 1 |
| WOMAN | 1=woman; 0=man | 144 | 0.5000 | 0.5017 | 0 | 1 |
| AGE | Age in years | 144 | 22.4653 | 3.8683 | 18 | 37 |
| WORK | 1=employed; 0=unemployed | 144 | 0.4306 | 0.4969 | 0 | 1 |
| INC | Income from all sources in NIS | 144 | 3,615 | 3,073 | 500 | 15,000 |
| PERSONS | Number of persons in the household | 144 | 5.4375 | 2.1146 | 2 | 10 |
| OWNER | 1=owner; 0=renter | 144 | 0.2083 | 0.4075 | 0 | 1 |
| ASHKENAZI | 1=Ashkenazi; 0= Sephardi | 144 | 0.5069 | 0.5017 | 0 | 1 |

Notes: NIS is the local Israeli currency, where 1 NIS ≈ 0.25 USD.

The total number of participants in all treatments is 144, where each treatment consists of exactly one-third of the entire sample (TREATMENT1, TREATMENT2_3, and TREATMENT3). We separated each treatment into two sessions of 24 participants, a female session and a male session. Consequently, 50% of the participants are women (WOMEN).

The mean age of the participants is 22.46 years (AGE). Only 43.06% of the respondents are employed (WORK), compared with a national average of 64.0% participation rate in workforce and 61.3% employment rate among the 15 year and above cohorts at the fourth quarter of 2017.[12] The average income from all sources is 3,615 NIS (INC), lower than the 2017-2018 minimum wage of NIS 5,300 NIS. The average number of persons per household is 5.4375 (PERSONS). Only 20.83% of the participants are owner-occupiers (OWNER), and 50.69% of the subjects are from a European origin (ASHKENAZI).

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[12] Israeli Central Bureau of Statistics (2017).

*5.2.2   The Empirical Model*

Consider the following empirical model:

$$
\begin{aligned}
TOTAL = {} & \alpha_1 + \alpha_2 \cdot TREATMENT2\_3 + \alpha_3 \cdot TREATMENT3 + \alpha_4 \cdot WOMAN \\
& + \alpha_5 \cdot AGE + \alpha_6 \cdot WORK + \alpha_7 \cdot INC + \alpha_8 \cdot PERSONS + \alpha_9 \cdot OWNER \quad (7) \\
& + \alpha_{10} \cdot ASHKENAZI + u
\end{aligned}
$$

where *TOTAL* (the total level of contribution in tokens); The independent variables are: *TREATMENT2_3*, *TREATMENT3* (*TREATMENT1* is the base category); the independent control variables are: *WOMAN*, *AGE*, *WORK*, *INC*, *PERSONS*, *OWNER*, *ASHKENAZI*. Finally, $\alpha_1, \alpha_2, ..., \alpha_{10}$ are parameters, and $u$ is the stochastic random disturbance term.

A simple analysis of the empirical model, where all the control variables are set to zero, and the circumflex denotes projected parameters, gives the following outcomes:

1) $TREATMENT2 = 0; TREATMENT3 = 0: \ proj(TOTAL) = \hat{\alpha}_1$

2) $TREATMENT2 = 1; TREATMENT3 = 0: \ proj(TOTAL) = \hat{\alpha}_1 + \hat{\alpha}_2$

3) $TREATMENT2 = 1; TREATMENT3 = 1: \ proj(TOTAL) = \hat{\alpha}_1 + \hat{\alpha}_2 + \hat{\alpha}_3.$

That is, $\hat{\alpha}_1$ represents the projected contribution level of treatment 1 (100% of the contributions are assigned to finance the ongoing operations of the campus synagogue); $\hat{\alpha}_2$ captures the contribution difference between treatment 2 (80% of the contributions are assigned to finance the procurement of sustainable supplies for the campus synagogues and 20% to finance the ongoing operations of the campus synagogue); and treatment 1 (100% of the contributions are assigned to finance the procurement of sustainable supplies for the campus synagogue). Finally, $\hat{\alpha}_3$ captures the contribution difference between treatment 3 and treatment 2.

*5.2.3   Regression Outcomes*

Following the empirical model given above, Table 3 reports the outcomes of the regression analysis. The table includes two columns, where column 1 (2) represents the

full (stepwise) model. The latter gradually omits variables with insignificant coefficients.

**Table 3:** Regression Analysis Stratified by Treatments

| VARIABLES | (1) full TOTAL | (2) Step-wise TOTAL |
|---|---|---|
| Constant | -18.7073 | -17.0158 |
| | (53.2106) | (24.6394) |
| TREATMENT2_3 | 104.9629*** | 102.4447*** |
| | (16.4404) | (15.4184) |
| TREATMENT3 | 33.1309* | 32.0807** |
| | (18.0107) | (15.3191) |
| WOMAN | 45.6009*** | 45.9942*** |
| | (13.7264) | (13.1583) |
| AGE | -0.2310 | – |
| | (2.3060) | – |
| WORK | 16.3953 | – |
| | (24.9176) | – |
| INC | -0.0027 | – |
| | (0.0045) | – |
| PERSONS | 15.0588*** | 14.5337*** |
| | (3.3792) | (3.2833) |
| OWNER | 16.1448 | – |
| | (16.7533) | – |
| ASHKENAZ | -44.9282*** | -47.7774*** |
| | (14.6103) | (14.0706) |
| Observations | 144 | 144 |
| R-squared | 0.5862 | 0.5825 |
| F-Statistic | 21.09 | 38.50 |

Notes: TOTAL is the total contribution in tokens, where NIS 1 equals 0.1 tokens. The stepwise model gradually omits variables with insignificant coefficients. Numbers in parentheses are standard errors. * significant at the 10% significance level. ** significant at the 5% significance level. *** significant at the 1% significance level.

Results support the hypothesis of zero expected contribution level for treatment 1 (100% assignment to ongoing operations). Projected contribution *rises* significantly by 102.4-105.0 tokens with the shift from treatment 1 to treatment 2 (significant at the 1% significance level). Finally, an additional significant *rise* of 32.1-33.1 is obtained with a shift from treatment 2 to treatment 3 (significant at the 10%-5% significance level).

Regardless of the treatments, compared to men, women contribute 45.6-46.0 additional tokens (significant at the 1% significance level). Projected contribution rises significantly with the number of persons in the household by 14.5-15.1 tokens per additional person (significant at the 1% significance level). Compared to individuals from Sephardic origin,[13] individuals from Ashkenazi origin contribute 44.9-47.8 tokens less (significant at the 1% significance level).

## 6. Summary and Conclusions

We study the effect of the objective of the contributions on the willingness to contribute to public goods. We conducted three treatments of a fundraising experiment among religious Jewish students in which the contributions were assigned to finance sustainable supplies and ongoing operations of their campus synagogue. In each treatment, we changed the allocation of contributions between contributions for sustainable supplies and contributions to ongoing operations. In treatment 1, all of the contributions were assigned to finance the ongoing operations of the campus synagogue. In treatment 2, 20% of the contributions were assigned to finance the ongoing operations of the campus synagogue, and 80% were assigned to finance procurement of sustainable supplies. In treatment 3, all of the contributions were assigned to finance procurement of sustainable supplies for the campus synagogue. The results, which are captured by a simple theoretical benchmark model, show that controlling for the socioeconomic characteristics of the subjects, the average projected contribution increases with the share of contributions assigned to the procurement of sustainable supplies.

Our results suggest that people prefer to contribute to durable public goods rather than their ongoing operations. In other words, people seem to derive, ceteris paribus, a higher utility from \$1 contributed to durable goods compared with \$1 contributed to consumable goods. The reason may be that contributions to durable goods provide a higher "warm glow" or that people derive utility from the duration of their dollars' effect. That is, the level of contributions may not be determined only by the needs of the organization or institution, but also depend on the durability of the contributions.

Many institutions and organizations that raise charity have encountered difficulty in raising funds for the maintenance of durable public goods such as buildings and

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[13] Most of Sephardic Jews originate from Islamic countries.

laboratories, even compared with obtaining contributions for the construction of the buildings or laboratories. Our results provide experimental evidence of this difficulty and thus may imply that an organization seeking to maximize charitable giving to finance a durable public good that also requires ongoing operations costs should raise funds solely for the durable public good, hiding, if possible, the fact that part of the contributions will be used to finance the ongoing operations.

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# Appendix

## Treatment 1: Instructions

### Contribution for the ongoing operations of the campus synagogue

Dear participant,

Thank you for agreeing to participate in our experiment.

There are other people in this room who are also participating in this experiment. You must not talk to them or communicate with them in any way during the experiment.

In this experiment, you will be asked to contribute privately to the ongoing operations of the campus synagogue (e.g., food and beverages to be served during lessons and religious ceremonies, payment for invited lectures). The experiment has one round. For this round you will be given 500 tokens with a total worth of 50 NIS, i.e., each token is worth 0.1 NIS.

First, you will be asked to decide, privately, the number of tokens you would like to contribute. The number of tokens which you did not contribute will be converted to NIS at the end of the experiment.

The experiment will take about 30 minutes, and at the end, you will be paid in private and in cash. The amount of money you will receive depends only on the value of your contribution; however, the total value of contributions to the ongoing operations of the campus synagogue depends on your contribution as well as on the other participants' contributions.

Here are two examples:

You will see the following screen:

How many of your 500 tokens (50 NIS) are you willing to contribute to the ongoing operations of the campus synagogue (e.g., food and beverages to be served during lessons and religious ceremonies, payment for invited lectures)?

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1) Suppose that you answer the question by entering "**100"** into the answer box. In that case, you will receive 40 NIS at the end of the experiment.

$$\left( \frac{500-100}{10} = 40 \right)$$

2) Suppose that you answer the question by entering "**205"** into the answer box. In that case, you will receive 29.5 NIS at the end of the experiment.

$$\left( \frac{500-205}{10} = 29.5 \right)$$

Next, you will be asked to answer a short questionnaire.

The experiment's procedure and the nature of the questionnaire guaranty full anonymity. You are identified only by your experiment identification number that which will be used to convert your private tokens (the tokens you chose not to contribute) to NIS at the end of the experiment.

At the end of the experiment, each participant will be identified by an experiment identification number and receive payment according to the contribution he or she has made, while the total value of contributions will be transferred to the campus Rabbi. After receiving the payment, we would ask that you then leave the experiment area.

To make sure everyone understands how earnings are calculated, we are going to ask you to complete a short quiz. Once everyone has completed the quiz correctly, we will continue with the experiment. If you finish the quiz early, please be patient.

# Treatment 1: The quiz

1. How many tokens do you have for the experiment?
   - o 200
   - o 135
   - o 350
   - o 500

2. How many times will you be asked to contribute to the ongoing operations of the campus synagogue (e.g., food and beverages to be served during lessons and religious ceremonies, payment for invited lectures)?

   - o 2
   - o 1
   - o 3
   - o 7

3. Which of the following is a legitimate answer to the question: How many of your 500 tokens (50 NIS) are you willing to contribute to the ongoing operations of the campus synagogue (e.g., food and beverages to be served during lessons and religious ceremonies, payment for invited lectures)?
   - o -20
   - o 600
   - o 135
   - o 850

4. How much money will you receive at the end of the experiment if you have chosen to contribute 150 tokens to the ongoing operations of the campus synagogue (e.g., food and beverages to be served during lessons and religious ceremonies, payment for invited lectures)?

   - o   25 NIS.
   - o   35 NIS.
   - o   40 NIS.
   - o   27 NIS.

Thank you for your participation.

# Treatment 2: Instructions

**80% of the contributions are assigned to the procurement of sustainable supplies for the campus synagogue, 20% of the contributions are assigned to finance the ongoing operations of the campus synagogue.**

Dear participant,

Thank you for agreeing to participate in our experiment.

There are other people in this room who are also participating in this experiment. You must not talk to them or communicate with them in any way during the experiment. The experiment has one round. For this round you are given 500 tokens with a total worth of 50 NIS, i.e., each token is worth 0.1 NIS.

In this experiment, you will be asked to contribute privately to the procurement of sustainable supplies for the campus synagogue (e.g., praying books, religious books, religious artifacts).

20% will be taken out of your contribution to finance the ongoing operations of the campus synagogue (e.g., food and beverages to be served during lessons and religious ceremonies, payment for invited lectures).

First, you will be asked to decide, privately, the number of tokens you would like to contribute (remember that 20% will be taken out of your contribution to finance the ongoing operations of the campus synagogue). The number of tokens which you did not contribute will be converted to NIS at the end of the experiment.

The experiment will take about 30 minutes, and at the end, you will be paid in private and in cash. The amount of money you will receive depends only on the value of your contribution; however, the total value of contributions to the procurement of sustainable supplies for the campus synagogue depends on your contribution as well as on the other participants' contributions.

Here are two examples:

You will see the following screen:

How many of your 500 tokens (50 NIS) are you willing to contribute to the procurement of sustainable supplies for the campus synagogue (e.g., praying books, religious books, religious artifacts)? ☐

(Remember that 20% will be taken out of your contribution to finance the ongoing operations of the campus synagogue, that is, food and beverages to be served during lessons and religious ceremonies, payment for invited lectures).

1) Suppose that you answer the question by entering "**100**" into the answer box. In that case, you will receive 38 NIS at the end of the experiment. $\left( \dfrac{500-100}{10} = 40 \right)$

2) Suppose that you answer the question by entering "**205**" into the answer box. In that case, you will receive 29.5 NIS at the end of the experiment. $\left( \dfrac{500-205}{10} = 29.5 \right)$

Next, you will be asked to answer a short questionnaire.

The experiment's procedure and the nature of the questionnaire guaranty full anonymity. You are identified only by your experiment identification number that which will be used to convert your private tokens (the tokens you chose not to contribute) to NIS at the end of the experiment.

At the end of the experiment, each participant will be identified by an experiment identification number and receive payment according to the contribution he or she has made, while the total value of contributions will be transferred to the campus Rabbi. After receiving the payment, we would ask that you then leave the experiment area.

To make sure everyone understands how earnings are calculated, we are going to ask you to complete a short quiz. Once everyone has completed the quiz correctly, we will continue with the experiment. If you finish the quiz early, please be patient.

## Treatment 2: The quiz

1. How many tokens do you have for the experiment?
    - o 200
    - o 135
    - o 350
    - o 500

2. How many times will you be asked to contribute to the procurement of sustainable supplies for the campus synagogue (e.g., praying books, religious books, religious artifacts)?
    (Remember that 20% will be taken out of your contribution to finance the ongoing operations of the campus synagogue, that is, food and beverages to be served during lessons and religious ceremonies, payment for invited lectures).

    - o 2
    - o 1
    - o 3
    - o 7

3. Which of the following is a legitimate answer to the question: How many of your 500 tokens (50 NIS) are you willing to contribute to the procurement of sustainable supplies for the campus synagogue (e.g., praying books, religious books, religious artifacts)?
    (Remember that 20% will be taken out of your contribution to finance the ongoing operations of the campus synagogue, that is, food and beverages to be served during lessons and religious ceremonies, payment for invited lectures).
    - o -20

o   600

o   135

o   850

4.  How much money will you receive at the end of the experiment if you have
    chosen to contribute 150 tokens to the procurement of sustainable supplies for
    the campus synagogue (e.g., praying books, religious books, religious artifacts)?
    (Remember that 20% will be taken out of your contribution to finance the
    ongoing operations of the campus synagogue, that is, food and beverages to be
    served during lessons and religious ceremonies, payment for invited lectures).

    o   35 NIS.

    o   25 NIS.

    o   40 NIS.

    o   24 NIS.

5.  Suppose you have decided to contribute 200 tokens. How many tokens did you
    contribute to the procurement of sustainable for the campus synagogue?

    o   200

    o   100

    o   160

    o   120

Thank you for your participation.

# Treatment 3: Instructions

## Procurement of sustainable supplies for the campus synagogue

Dear participant,

Thank you for agreeing to participate in our experiment.

There are other people in this room who are also participating in this experiment. You must not talk to them or communicate with them in any way during the experiment.

In this experiment, you will be asked to contribute privately to the procurement of sustainable supplies for the campus synagogue (e.g., praying books, religious books, religious artifacts). The experiment has one round. For this round, you will be given 500 tokens with a total worth of 50 NIS, i.e., each token is worth 0.1 NIS.

First, you will be asked to decide, privately, the number of tokens you would like to contribute. The number of tokens that you did not contribute will be converted to NIS at the end of the experiment.

The experiment will take approximately 30 min, and at the end, you will be paid in private and in cash. The amount of money you will receive depends only on the value of your contribution; however, the total value of contributions to the procurement of sustainable supplies for the campus synagogue depends on your contribution as well as on the other participants' contributions.

Here are two examples:

You will see the following screen:

How many of your 500 tokens (50 NIS) are you willing to contribute to the procurement of sustainable supplies for the campus synagogue (e.g., praying books, religious books, religious artifacts)? ⬚

1) Suppose that you answer the question by entering "**100**" into the answer box. In that case, you will receive 40 NIS at the end of the experiment.

$$\left( \frac{500-100}{10} = 40 \right)$$

2) Suppose that you answer the question by entering "**205**" into the answer box. In that case, you will receive 29.5 NIS at the end of the experiment.

$$\left( \frac{500-205}{10} = 29.5 \right)$$

Next, you will be asked to answer a short questionnaire.

The experiment's procedure and the nature of the questionnaire guaranty full anonymity. You are identified only by your experiment identification number that which will be used to convert your private tokens (the tokens you chose not to contribute) to NIS at the end of the experiment.

At the end of the experiment, each participant will be identified by an experiment identification number and receive payment according to the contribution he or she has made, while the total value of contributions will be transferred to the campus Rabbi. After receiving the payment, we would ask that you then leave the experiment area.

To make sure everyone understands how earnings are calculated, we are going to ask you to complete a short quiz. Once everyone has completed the quiz correctly, we will continue with the experiment. If you finish the quiz early, please be patient.

# Treatment 3: The quiz

1. How many tokens do you have for the experiment?
    - o 200
    - o 135
    - o 350
    - o 500

2. How many times will you be asked to contribute to the procurement of sustainable supplies for the campus synagogue (e.g., praying books, religious books, religious artifacts)?

    - o 2
    - o 1
    - o 3
    - o 7

3. Which of the following is a legitimate answer to the question: How many of your 500 tokens (50 NIS) are you willing to contribute to the procurement of sustainable supplies for the campus synagogue (e.g., praying books, religious books, religious artifacts)?
    - o -20
    - o 600
    - o 135
    - o 850

4. How much money will you receive at the end of the experiment if you have chosen to contribute 150 tokens to the procurement of sustainable supplies for the campus synagogue (e.g., praying books, religious books, religious artifacts)?

- o 25 NIS.
- o 35 NIS.
- o 40 NIS.
- o 27 NIS.

Thank you for your participation.