Anonymity in Giving in a Natural Context —

A Field Experiment in Thirty Churches

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Abstract

The role of anonymity in giving is examined in a field experiment performed in thirty Dutch churches. For a period of 29 weeks, the means by which offerings are gathered is determined by chance, prescribing for each offering the use of either 'closed' collection bags or open collection baskets. When using baskets, attendees can see the contribution made by their direct neighbors as well as the total amount already gathered.

Contributions to offerings with an external cause initially increase by 10% when baskets are used, but this effect peters out over time. No effect is found for offerings with an internal cause. This result can be explained by the presence of social incentives, but is also in line with recent studies showing that asymmetric information about the quality of the charity leads to increased contributions.

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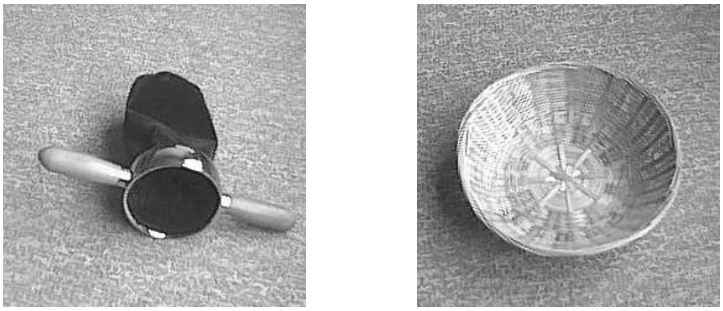
1 Introduction

How does anonymity affect giving? Recently, this question has been addressed in some public good experiments (Andreoni and Petrie, 2004; Rege and Telle, 2004). These studies find that contributions increase when subjects are unmasked, indicating that — besides economic motivations — there is a role for social incentives in giving. Subjects act on the circumstance that they can see what others give and that their giving decisions are observed and potentially evaluated by others.

Intuition suggests that the extent to which subjects care about this evaluation by others is dependent on the social ties that exist between them. Van Dijk *et al.* (2002) prove that social ties can indeed form between subjects participating in public good experiments, which validates the presence of social ties as a potential explanation for the observed increase in contributions. However, the ties formed between subjects in the laboratory are fundamentally different from the ties that exist between individuals in repeated real-life interactions. Consequently, it is not clear to which extent laboratory findings on the effect of anonymity on giving decisions can be extrapolated to real-life situations. Ideally, one would like to observe the effect of removing anonymity on contribution decisions made by individuals in their natural habitat.

The field experiment in this paper tries to accomplish exactly this, by implementing a change in the anonymity of giving to offerings in thirty Baptist churches in the Netherlands. These churches commonly collect at least two offerings during a service by means of 'closed' collection bags. (See figure 1a.) To examine the role of anonymity, the following treatment is imposed. For a period of 29 weeks, the familiar collection bags are randomly replaced with open collection baskets (see figure 1b). Contrary to the bags, the basket treatment provides attendees with two additional pieces of information. First, nearest neighbors can observe each other's contributions and second, attendees can see the total amount already gathered. For each offering, baskets are assigned with probability 0.5 (treatment group), bags are assigned otherwise (control group).

To test the hypothesis that anonymity affects contribution levels, I compare the contributions in the treatment group with those in the control group. Using nonparametric tests I find that the replacement of bags by baskets significantly increases contributions to the second offering of a service, but that no effect is



a. collection bag b. collection basket

Figure 1: Collection bags and baskets used.

found for the first offering. This finding is corroborated by subsequent econometric analysis of the data. Estimates indicate that the treatment increases proceeds of the second offering by as much as 10 percent, but that this effect peters out over time. Possible explanations for the difference in treatment effect use the fact that the first offering's proceeds are always earmarked to the parish itself (public good), whereas the second offerings often serves causes outside the own parish (charity good). One explanation is that social incentives have a different effect when the offering serves an external cause. An alternative explanation argues that whereas every attendee knows the value of the public good, not everybody will be familiar with the charity good. Therefore, in a non-anonymous context, asymmetric information may lead to higher contributions to external causes when the attendees who contribute first have an incentive to signal their private information about the quality of the cause. Additional analysis shows that the difference in effect can indeed be traced back to the difference in internal and external causes.

Three churches provided detailed information on the coins that were collected in each offering. These data show that when baskets are used, the portion of small coins (up to 20 eurocent) declines as churchgoers shift to giving larger coins (1 and 2 euro). This provides further evidence that social factors play a role in non-anonymous contribution decisions.

The paper proceeds as follows. Section 2 briefly reviews results from experiments and field studies as well as the (small) existing literature on giving in churches. Section 3 gives the experimental setup. Data are presented in Section 4 and Section 5 contains the results. In Section 5.1 the effect of the basket-treatment is identified non-parametrically. A panel data model to quantify the treatment

effect is presented in Section 5.2 and estimated in Section 5.3. Section 6 analyzes the effect of using baskets on the type of coins given. Section 7 concludes.

2 The role of anonymity in giving

Before proceeding to the experiment, I briefly review previous work on the role of anonymity in contribution decisions to a public good or to charity.

2.1 Experimental and field studies

A couple of studies on public good experiments have recently investigated the role of anonymity in giving (Andreoni and Petrie, 2004; Rege and Telle, 2004; Gächter and Fehr, 1999). Their main conclusion is that removing anonymity leads to increased contributions. Gächter and Fehr (1999) note that when "the opportunity for social exchange is combined with some minimal social familiarity there is a substantial increase in contribution levels." (p. 352). In line with this, Hoffman, McCabe and Smith (1996) find that in experimental dictator games offers are lowered as the social distance between the experimental subjects and the experimental leader increases.

Explanations commonly given to explain these greater contributions when subjects are identified point to the presence of social incentives like prestige, receiving social approval, avoiding shame, social comparison and/or fairness. Harbaugh (1998a, b) shows the positive effect of category reporting using field data on fund raising. His explanation is that the prestige, derived from having the amount of a donation publicly known, has a positive effect on an individual's contribution decision. Masclet *et al.* (2003) find that the opportunity for agents to express disapproval of others decisions increases contribution levels.[1] Field evidence by Haan and Kooreman (2002) suggests that individuals may experience a strong moral obligation to pay the price asked in settings where they are free to choose their contribution. Fairness considerations influence the decision-making process if individuals value how their contribution relates to some "fair" standard, which itself is some function of the contributions of others (Bolton and Ockenfels, 2000; Fehr and Schmidt, 1999, and Fehr and Gächter, 2000). Individuals who care

[1] See Bowles and Gintis (2003) for an analytical model showing that shame can increase the level of cooperation in a group.

about how their contribution compares to the contributions of others are led by motivations of social comparison.

In the churches, prestige might lead to higher contributions when baskets are used, since only baskets provide the necessary identification of an individual's contribution by others.[2] Churchgoers searching for social approval may seize the opportunity given by the baskets to show that they "do their part" and increase their contribution. They might however be wary to overdo it for reasons of fairness and social comparison, since deviating too much from an implicitly agreed upon 'standard' amount may trigger negative reactions. In this way the identification provided by the baskets may increase average contributions when social approval and shame are important motives.

Two differences between public good experiments and the current setup have to be mentioned. First, in the studies mentioned, identification in the non-anonymity condition is *global*, in the sense that a subject's contribution is revealed to *all* other participants. The current setup provides *local* identification, because only nearest neighbors can identify each others contributions. Second, the order of moves in the basket offerings is inherently sequential instead of simultaneous. Sequential play may help to sustain cooperation when a substantial fraction of the subjects are conditional cooperators (Houser and Kurzban, 2003).[3] Furthermore, in the presence of asymmetric information about the quality of the cause, sequential play gives first movers the possibility to signal private information to followers. Vesterlund (2003) provides a theoretical model on sequential fundraising showing that announcement of contributions can be optimal when there is imperfect information about the value of the good. Potters, Sefton and Vesterlund (2003) experimentally show that leading-by-example increases contributions in an environment where a leader has private information about the returns from contributing. List and Lucking-Reiley (2002) report the positive effect of publicly announcing amounts of 'seed money', indicating that individuals take the amount already given by others into account in making their own contribution decision.

This field experiment has some advantages relative to laboratory experiments.

[2]This is not fully true. Individuals could in fact choose to voluntarily show their contribution to their neighbors before dropping it into the bag. However, it does not seem likely that this plays an important role in practice.

[3]Andreoni, Brown and Vesterlund (2002) look at fairness considerations in a two-person sequential public good game.

First, church attendees do not primarily choose to participate in an experiment, they choose whether or not to go to church.[4] Second, attendees have made for years the contribution decision that is under investigation. As a result, there is no doubt that they understand the procedure and moreover, pre-experimental data are available for analysis. Finally, church attendees donate money they earned in their daily life instead of money given to them by the experimenter. A disadvantage is that individual contributions cannot be observed because for each offering only aggregate amounts are reported. This makes it for example impossible to pin down precisely the number of people that make non-zero contributions.

2.2 Literature on giving in churches

The number of studies dealing with giving in churches are relatively few. Most of the existing studies focus on group-size effects by looking at per-member rates of annual giving. Sullivan (1985), Stonebraker (1993) and Zaleski and Zech (1994) all report a negative relationship between the number of members and per-member rates of annual giving.[5] Yet it is hard to interpret these results as evidence that free riding increases in group size. Zaleski and Zech (1996) for example put forward that for small parishes, members may agree to collectively share congregation costs. Since these costs do not increase proportionately with membership, an increase in membership leads to a drop in per capita giving. Alternative explanations are that the congregation size is endogenous, that church members feel that the quality of the services decreases as the number of members increases (Iannaccone, 1998) or that public good considerations are minor in giving decisions because members "make a bargain with God" (Tullock, 1996).

A notable difference between the present study and previous studies is that the data I examine are weekly contributions to offerings by church *attendees* instead of annual contributions by church *members*. This gives the opportunity to use intra-church variation in the number of attendees to assess a possible group size effect. In addition, I get rid of a host of confounding factors like e.g. the above mentioned cost sharing argument.

[4]The assumption that no-one alters this decision due to the introduction of baskets seems reasonable.

[5]Reported in Iannaccone (1998). Lipford (1995) found no evidence of a group size effect on giving, but was criticized by Zaleski and Zech (1996) for using a flawed specification.

3 Experimental design

3.1 Selection procedure

An invitation letter was sent to all 89 Baptist parishes in the Netherlands. This letter stated in general terms that the University of Groningen intended to start a research project on church offerings and that participating parishes could each receive a compensation of €300. Parishes should return a reply form if they were interested to participate in the project.[6] The questionnaire and the instructions that were sent to the local church councils used a neutral language. In particular, no reference was made to the role of anonymity in giving. Of the 45 parishes that reacted positively, 30 were selected for participation, based on the number of offerings during service and geographical dispersion. The sample is not biased toward particular small or large parishes.[7]

All selected parishes have service on Sunday morning and most of them have two offerings per service. Commonly, collection bags are used to gather the proceeds.[8] Two parishes have standard an exit offering that is gathered at the end of the service when attendees leave the building. One parish only rarely has a second offering.[9] Celebration of the Lord's supper – which in most parishes takes place monthly – results in an additional (third) offering during service in 21 parishes. At the Sunday of Easter and Pentecost, 3 and 2 churches, respectively, have only one offering with a special cause. The proceeds of these so-called 'gratitude offerings' are as a rule far above average.

In each selected parish, someone was appointed to coordinate the project (in most instances the treasurer). Besides filling out the questionnaire and gathering historical data, his or her task during the experimental period was to act as experimental leader, looking after the correct implementation of the setup. He instructed the deacons and made sure that in each service the number of attendees

[6] The amount of €300 is not unreasonable, since in order to receive this amount, parishes not only had to implement the experimental design, but they also had to collect historical information on the proceeds and cause of each individual offering held from 1995 onward and furthermore answer a questionnaire with general questions about the parish and the parishioners.

[7] The (rural) northern part of the country is somewhat overrepresented in the sample, reflecting the fact that a large number of Baptist parishes are located in this part of the country. The number of members of the churches in the sample varies from 26 to 384, with the median at 130. In general, an individual member is personally acquainted with a large fraction of the other members.

[8] An exception is formed by the extra offering gathered after having celebrated the Lord's supper, which is sometimes gathered by means of a plate (10 churches) or a mug (one church).

[9] This was only noticed after the beginning of the experimental period.

was counted. After service, he filled out a form with questions regarding the particularities of the service and the offerings.

Before the start of the experiment, the appointed person in each church received a randomized scheme indicating for each offering by which means it had to be gathered. These schemes were constructed as follows. For each offering, the Gauss random number generator drew from a $U[0,1]$ distribution; values larger than 0.5 resulted in the offering receiving the treatment. Note that in this way, it can happen that none, one or both offerings in one service are collected by means of a basket. Most churches informed their members in advance that offerings could be taken in by either bags or baskets. In some parishes this was communicated during a service or other meeting, and in other parishes a message appeared in the church periodical. The necessary baskets were sent to the churches.[10]

Baptists form a relatively small denomination in the Netherlands. With the first parishes already being founded around 1840, they now form an integral part of Dutch society. The parishes considered are affiliated to the national Baptist federation, but have a large degree of autonomy in organizing their services. Due to this, changes in aspects of the service like the introduction of baskets to gather offerings are more easily implemented than would have been the case in e.g. the Reformed or Catholic churches in the Netherlands, which are more hierarchically organized. The offerings represent on average 10 to 25% of total revenues of a parish which further comprise regular bank payments by the members, bequests and rents.[11]

3.2 Order of moves

At the beginning of service, one of the deacons announces to the congregation the number and the cause of the offerings that will be held. Just before the actual gathering, the minister makes an second announcement. One of more deacons pick up a collection bag from the table in front of the church, which is then passed in

[10] In the vast majority of the parishes, visitors did not know in advance for which particular offerings replacement took place. In six churches, visitors were told at the beginning of service whether bags or baskets were used for the offerings in that service.

[11] In some parishes it also happens that a small minority of members makes (for reasons of tax deduction) regular payments by bank explicitly labeled 'offering contribution' instead of contributing to the offerings during service. This lowers the observed average contribution per attendee. This does not affect the non-parametric effects which I will carry out at level of individual parishes; in the econometric estimation, the effect is absorbed by the church-specific fixed effect. The same is true for the possible endogeneity of the church selection decision.

the following way: Each deacon gives his bag to a visitor; (s)he makes his or her contribution and passes the bag to the person next to him or her. This procedure is repeated until the last person in the row has made his contribution. The bag is then passed to the next row. This procedure repeats until all attendees have had the opportunity to make a donation.[12] In most churches (26), the two offerings are taken in simultaneously, that is, the deacon hands out the first collection bag, waits until the churchgoer has passed the bag and then hands out the second collection bag to the same churchgoer.

3.3 Offering causes

In each church, the cause of the first offering is the parish itself; the cause of the second offering changes weekly and varies from parish to parish. The causes of the second offering can be divided into four categories. The first category comprises all offerings serving an internal cause. Examples are offerings for church building or renovation; offerings for bearing costs of sending flowers to elderly members or for evangelical work. The second category consists of offerings meant to fund (one of) the tasks of the national Baptist federation. The third category includes causes that have an indirect link to the own parish, like partner communities in Eastern Europe or missionaries sent out to developing countries. The last category consists of all causes outside the sphere of influence of the own parish, like for example offerings for Amnesty International or the Leprosy Fund. Thus the first offering has a public good character, whereas the second offering either has a public good character (in case of an internal cause) or more the character of a charity good (in case of an external cause).[13]

4 Data

The experimental period lasted for 29 Sundays, in the time period from March 3, to September 15, 2002. In one parish, the experiment ran till September 22 and in another till September 29, since in these parishes a few services were cancelled.

[12] During the gathering, the organ plays and possibly the congregation sings a song.

[13] Notice that in case an individual derives utility from the total amount his/her church donates to the external cause, his utility is positively affected by the amount donated by others, as in a public good situation.

One parish left the sample after three weeks[14] and was replaced by another in which the experimental period started at May 5 and ended at November 17.

INSERT TABLE 1 ABOUT HERE

For the first offering 834 observations are available and for the second 791. Tables 1 contains summary statistics on the first and second offering. The table shows that per-attendee proceeds are on average 23% higher for the first offering and that the distribution is skewed to the right for the first as well as the second offering. The mean values of the dummy variables show that — as a result of the randomization — about half of the first as well as the second offerings is gathered by means of bags, and the other half by means of baskets. The table further shows that in about 20% of the services an additional third offering is held ("is 3rd"); and in about 12% of the services an exit offering ("is exit"), which in half of the cases is meant for missionary work. These variables are included in the empirical analysis to account for the possible effect of additional offerings on the proceeds of the first two offerings. Exit offerings meant for missionary work are taken up separately, since they are often announced one week in advance.

The dummy "simultaneous" indicates whether the first offering is directly followed by the second, which is true in about 81% of the services. The fact that there is no time lag between the two contribution decisions may affect the amount given in each of the two offerings.[15] A few offerings receive a special recommendation or bear a relationship with the character of the service. Since recommendations are directly aimed at increasing the proceeds of an offering and a relation between the sermon and the offering cause increases the attendees' awareness of the offering, both are included in the empirical analysis.

Dummies for the presence of additional musicians ("music"), or coffee for free after service ("coffee") are included to pick up a possible "good mood" effect of hearing music and having the prospect of coffee. One's mood may also be affected by the amount of sunshine on a given day. "Sun" gives the daily hours of sunshine as a percentage of the maximum amount of possible sunshine one could obtain.[16]

[14]This parish ceased participation because the treasurer of this parish had to quit his job on personal grounds and could not find a successor.

[15]In non-simultaneous offerings, the first offering commonly takes place before the preaching and the second after the preaching.

[16]This maximum amount increases as days get longer. To take into account the geographical dispersion of the parishes, I use information from five different weather stations (provided by

The "own minister" dummy is included to pick up possible effects of the preacher on the perceived quality of the service, resulting in more or less generosity. The "special service" dummy equals one if the service has a special character, like e.g. baptizing services and services in which a new minister is installed. These services are characterized by a relatively large number of guests. The dummy for family services indicates whether a service has the character of a low-threshold family service, which are attended by an above average number of children who are likely to have a downward effect on average per-attendee contributions. The "evening service" dummy equals one if on the same Sunday a service is held in the evening hours. The opportunity to visit an evening service is seized by some parishioners, especially youth, to opt out for the morning service. Thus having an evening service may change the composition of the parishioners present in the morning service.

The dummy "Chr. celebration" equals one if the service is held on Christian celebration days like Easter and Pentecost. Besides affecting the number of people who go to church, attendees consider these days as special, which may influence their donation. In some churches, so-called gratitude offerings are collected on these special days to give attendees the opportunity to express their gratitude. In general, the contributions to gratitude offerings are far above average. Offerings held following the celebration of the Lord's Supper are also possibly used by attendees to express their gratitude. For these reasons, both a "gratitude" and a "Lord's Supper" dummy are included. With regard to the offering causes, the table makes clear that almost all (99.4%) of the first offerings have the own parish as cause; of the second offerings, 30% serves specific internal causes, 56% the Baptist federation and 7% other causes outside the own parish.

Table 2 presents summary statistics on the average per-attendee contributions to the first and second offerings for all parishes in the sample. Moreover, a distinction is made in offerings gathered by means of bags and offerings gathered by means of baskets. Large differences in average contributions are observed between different parishes.

INSERT TABLE 2 ABOUT HERE

the Royal Netherlands Meteorological Institute).

5 Results

5.1 Nonparametric tests

To assess the effect of using baskets on average offering proceeds, I first calculate Wilcoxon rank sum statistics. Gratitude offerings and offerings held after celebration of the Lord's Supper are dropped from the sample because of their special character. I distinguish between the effect on first and on second offerings. In a two-sided test, the null hypothesis of no treatment effect is rejected for the second offering but not for the first offering (p-value = 0.000014 and 0.1800, respectively).[17] For each parish, the calculated standard normal z-values are reported in the last column of table 2. At the level of individual parishes, large differences are observed. For the second offering, all significant differences (7 parishes on a 10% level) point to a positive effect from the introduction of baskets on average proceeds. For the first offering, significantly more is raised by baskets in three parishes but in one parish the baskets have a strong negative effect on average proceeds. Table 2 also reports for each parish the t-statistics obtained by performing a difference in mean test.[18] The patterns found are roughly similar to those found by using the Wilcoxon rank sum test, except for parish nr. 5.[19]

Both the Wilcoxon rank sum test and the difference in mean test assume that the observations are independent. In practice however, there might be a dependence between offerings held in the same parish, because from week to week more or less the same people visit service and, moreover, these regular visitors tend to take the same seats. The Wilcoxon signed rank test is an alternative that

[17] The calculation is as follows: For first offerings, denote for each parish the total number of times a bag is used by m, the number of times a basket is used by n and the sum of the ranks of the basket observations by R_n. Since the total of $n+m$ exceeds 10 in each parish cases, the asymptotic normality of R_n can be used such that $p(R_n \leq k) \equiv \Phi \quad \frac{k+1/2-n(m+n+1)/2}{\sqrt{mn(m+n+1)/12}}$ under the null hypothesis of no treatment effect. p-values for the general effect are obtained by aggregating the R_n values of all parishes. The procedure for second offerings is similar.

[18] For each parish, the t-statistics are calculated as $t_j = \frac{\overline{y_{j,basket}} - \overline{y_{j,bag}}}{S_p\sqrt{\frac{1}{n}+\frac{1}{m}}}$ with $S_p = \frac{(n-1)S_n^2+(m-1)S_m^2}{n+m-2}$ and $j = 1, 2$ denoting whether the offerings are first or second offerings, and $\overline{y_{j,bag}}$ ($\overline{y_{j,basket}}$) per-attendee proceeds averaged over all $j$ths offerings gathered by means of bags (baskets) during the experimental period.

[19] Data on the number and type of coins and bank notes show that in parish nr. 5, once a month a note of €100 is contributed. Each time, the note is contributed to an offering which is gathered by means of a bag and whose cause is the parish itself. Since the note increases the total proceeds with about 200%, the phenomenon leads to a number of outliers for which the difference in mean test is more sensitive than the Wilcoxon rank sum test. Pre-experimental data for this parish show that the act of giving a €100-note once a month already started in the year 2000 and is not a reaction to the introduction of baskets as a means to gather offerings.

does not assume independence. The test uses for each parish the observed paired percentage difference of average basket offering proceeds and average bag offering proceeds. According to this two-sided test, the p-values of no treatment effect are 0.2096 and 0.0727 for the first and second offering, respectively.

5.2 Econometric analysis

The field character of the experiment entails that one has to account for a number of covariates other than the treatment variable that potentially influence the offering proceeds and that vary between services (e.g. the number of attendees) or between offerings (e.g. the cause of the offering and the way in which the offering is recommended). I will call variables that vary between services "service specific" and variables that vary within services "offering specific". In order to assess the effects of anonymity while accounting for these covariates, the following panel regression is estimated

$$\begin{array}{rcl} \ln y_{it,j} & = & \alpha_{i,j} + \beta_j BASKET_{it,j} + \beta_3 BASKET_{it,1} \cdot D_{it,j} \\ & + & \sum_{k=1}^{4} (\zeta_k + \phi_{k,j} BASKET_{it,j}) \cdot T_k(t) + \delta_j \ln q_{it,j} \\ & + & \theta' x_{it,j} + (\psi_1'(1 - D_{it,j}) + \psi_2' D_{it,j}) \cdot z_{it,j} + \epsilon_{it,j}, \end{array} \tag{1}$$

where the logarithm of the average per-attendee contribution $y_{it,j}$ to the jth offering in week t of the experimental period in parish i is the dependent variable; $i \in \{1, \ldots, 30\}$; $j \in \{1, 2\}$; $t \in \{1, \ldots, 29\}$. With regard to the disturbances $\epsilon_{it,j}$, note that the first and second offering in the same service are likely to be correlated. For example, the presence of generous people will be beneficial to both the first and the second offering. If attendees determine in advance the sum of money they bring with them to church, only deciding during service how to split this sum between offerings, this induces a negative correlation. Furthermore, since the dependent variable is (logarithm of) the average contribution per attendee, the errors terms are heteroscedastic, with variance decreasing in the number of attendees. To allow both for correlation and heteroscedasticity, the error structure is modeled as follows: $var(\epsilon_{it,j}) = \sigma_{jj}/q_{it}$; $cov(\epsilon_{it,1}, \epsilon_{it,2}) = \sigma_{12}/q_{it}$ and $cov(\epsilon_{it,j}, \epsilon_{vw,k}) = 0$ whenever $v \neq i$ or $t \neq w$, $j, k \in \{1, 2\}$.

The coefficients $\alpha_{i,j}$ absorb church specific fixed effects. Moreover, by adding a subscript j, I allow the effect of church specific variables to differ between the first and second offering. $BASKET_{it,j}$ is a dummy variable indicating whether baskets are used to gather the offering. The parameters β_1 and β_2 thus measure

the effect of switching from bags to baskets. The dummy variable $D_{it,j}$ takes on the value 1 if the observation under consideration is a second offering and 0 otherwise, so $D_{it,j} = 1$ iff. $j = 2$. As a result, β_3 estimates the effect of using a basket in the first offering on the proceeds of the second offering.[20]

The functions $T_k(t)$ represent non-overlapping time-intervals defined as $T_k(t) = I[6k < t \leq 6(k+1)]$, $k = 1, \ldots, 4$, with $I[\cdot]$ an indicator function. The coefficients ζ_i pick up possible effects of inflation or changes in the income of parishioners during the experimental period. The products of these time intervals with the basket dummy are added to incorporate changes in the treatment effect over time, where again a distinction is made between the first and second offering. The number of attendees is given by $q_{it,j}$ such that $1 + \delta_j$ reflects the percentage increase in total proceeds by a one percent increase in the number of attendees. $x_{it,j}$ is a vector of service-specific binary variables (is 2nd, is 3rd, is exit, mission exit, simultaneous, music, coffee, family service, special service) and the continuous variable "sun".

The vector $z_{it,j}$ contains binary variables that are offering specific (recommendation, relation, federation, external, Eastern Europe, gratitude)[21] or that might for some reason have a different effect on the first than on the second offering (own minister, evening service and Chr. celebration).[22] For "own minister" this reason is that the minister receives his salary from the parishes' internal funds. The possibility of an evening service might lead to a selection effect. Since 63% of the evening services have only one offering (usually for the parish itself), parishioners who normally visit the evening service may have another attitude to the second than to the first offering. Christian celebrations might have a larger effect on second offerings that are held after the preaching.

5.3 Estimates

The results are based on 791 services with at least two offerings, leading to a total of 1582 included observations.[23] Estimates are given in table 3. The first column contains least squares estimation results for the model without a time trend for the

[20] Since in some of the parishes attendees know in advance how the second offering will be collected, one might argue that also a parameter measuring the effect of using a basket in the second offering on the proceeds of the first offering should be added. However, since it turns out that β_3 is insignificant across specifications, the same is likely to be true for the reverse effect.

[21] Internal causes act as reference category.

[22] A specification test did not find a difference in effect for the variables in $x_{it,j}$.

[23] Contrary to the analysis in Section 5.1, gratitude offerings and offerings following celebration of the Lord's Supper are included in the sample.

treatment and neglecting heteroscedasticity in the error terms. Column (2) gives the results of a basic regression with heteroscedasticity taken into account. In this regression, the only explanatory variables added besides the basket dummy are dummies for the offering causes and a service specific group size effect. In column (3), the same model as in (1) is estimated but now with heteroscedasticity taken into account. The complete model is estimated in column (4), addressing heteroscedasticity and incorporating a linear time trend.

In line with the pattern revealed by the nonparametric tests in the previous section, the four specifications provide no evidence of a treatment effect on the average proceeds of the first offering, but they do show a highly significant increase in those of the second. For the complete model, the initial increase in proceeds of the second offering by the introduction is estimated at 10.1%.[24] This increase is smaller as in Andreoni and Petrie (2004), who find an initial increase of about 35%. Among other things, one reason for this difference might be that in the current setup, identification is local instead of global.

For the second offering, the number of periods since the start of the experimental period has a significant (p-value = 0.018) and sizeable negative effect on the treatment effect: The effect of using baskets for the second offering peters out over time. It is tempting to relate the diminishing effect in time to the finding in public good experiments that contributions decline with repetition (Isaac, McCue and Plott, 1985). This relation however is somewhat problematic since there is no final round in the current setup (offerings were still held after the experimental period ended) nor can the second offering be considered as a pure public good. A similar negative time-effect is found in Haan and Kooreman (2002), which also lacks a clearly defined final round. It is unclear what causes the particular large drop in weeks 19 till 24. In general, contributions increase over time. The estimates imply an annual increase in offering proceeds of about 8.4%. The means of gathering of the first offering does not have an effect on the proceeds of the second offering. The overall effect of using baskets (calculated by summing $\hat{\beta}_1, \hat{\beta}_2$ and $\hat{\beta}_3$) is significantly positive at the 5-percent level. The hypothesis that the effect of using baskets is the same for the first and second offering is clearly rejected.

INSERT TABLE 3 ABOUT HERE

[24] $e^{\beta_2} - 1 = 0.101$.

Looking at the other coefficients in column (4), one sees a negative group size effect as measured by the δ_j's: a 1 percent increase in the number of attendees leads for both offerings only to a 0.7 percent increase in total proceeds. This is consonant with earlier empirical studies on giving in churches. A possible explanation is that on Sundays with relatively few attendees, the people who come are the most dedicated and most generous ones. The presence of an additional third offering leads to a reduction in average proceeds of the first two offerings of 8%, but no such effect occurs for additional exit offerings. As expected, average contributions are lower when the service is a family service and people give more when a service is held at Easter or Pentecost. The own minister leading the service does not affect contributions.

Interestingly, recommending the offering increases contributions to the second offering by 28% but has no effect on the proceeds of the first offering. The same goes for the offering cause being related with the preaching. This shows that parishioners are sensitive to recommendations. Partly this may be caused because an appeal is made to their social obligation to contribute. Gratitude offerings bring in 220% (84%) more if held as first (second) offering. Having an evening service on the same day does not affect average contributions to the first offering, but increases the average proceeds of the second offering by 11%, suggesting a negative correlation between being inclined to attend the evening instead of the morning service and the willingness to contribute to the second offering. Finally, proceeds of the second offering are much higher (+45%) when the cause is in Eastern Europe; higher when the cause is an external one (+8%) and slightly lower when the offering serves the national federation (−4%).

How do the results in this and the previous section relate to the experimental evidence on anonymity in giving? The positive treatment effect found for the second offering is in accordance with the experimental results of both Andreoni and Petrie (2004) and Rege and Telle (2004). Contrary to these however is the absence of a treatment effect for the first offering. Is this difference due to the fact that the first offering has the character of a public good whereas the second offering often serves an external cause? In order to analyze this question, I estimated equation (1) separately for two subsets of the data. The first subset comprises the services

that have a second offering with an internal cause; the second subset comprises the subset of services that have a second offering with an external cause. Estimates are given in columns (5) and (6) of table 3, respectively. Interestingly, the estimates show that the significance of the treatment effect for the second offering is persistent for the subset of external second offerings, but not for the subset with internal second offerings. Thus the basket-treatment only has a positive effect on contributions when the offering has the character of a charity.

There are a number of behavioral explanations for this result. First, most churchgoers make — in addition to the amounts given to the offerings — regular bank payments to the parish. Since these amounts are not observed by the other parishioners, one can always defend low contributions to internal offerings by claiming that one compensates for this by one's bank payments. Having an excuse might prevent people from feeling ashamed. For external offerings, no such excuse is available. Second, one can argue that external offerings give better opportunities to exhibit unselfish behavior, since there is no direct monetary payoff to the contributor.

A third explanation does not use social incentives to explain the difference but points to the possible role of asymmetric information when the offering has the character of a charity. When the offering has the character of the public good, everybody knows its value, because all attendees are members of the same church. Offerings for charity however serve each week a different cause and not everybody will be familiar with that cause. In this case, attendees with private information about the quality of the charity have an incentive to signal their information to others in order to stimulate them to contribute. The opportunity to "lead-by-example" can reduce the free-rider problem and increases contributions in an environment where a leader has private information about the quality of a charity.[25] Potters, Sefton and Vesterlund (2003) provide experimental evidence of this. In the current setup however, we cannot identify whether the difference in treatment effect is caused by social incentives, asymmetric information or both.

With regard to the other explanatory variables it is interesting to note that the "Chr. celebration" dummy and the "gratitude" dummy are only significant for the subset of internal offerings. The reason for this may be that gratitude

[25] I am grateful to an anonymous referee for raising this point.

for the resurrection of Christ finds a natural expression in contributing an extra amount to the own parish, but not in contributing to e.g. Amnesty International. The "recommendation" dummy on the other hand is much larger for the subset of external offerings, lending support to the hypothesis that making an appeal to the moral obligation of the attendees has more effect when the cause is external.

6 Effect on type of coins contributed

As mentioned, information on the number and the type of coins collected is available for three parishes. For two parishes this information is available for first as well as second offerings and for the other only for the first offerings. For the latter parish, information is also available for the pre-experimental period.[26] Histograms and cumulative distribution functions are given in figure 2.

INSERT FIGURE 2 ABOUT HERE

The panels *a*, *b* and *c* all show the same pattern: as compared to closed offerings, collecting offerings by means of baskets leads to a decrease in the average fraction of small coins (1, 2, 5, 10 and 20 eurocents) and an increase in the average fraction of large coins (1 and 2 euro).[27] For parishes *a* and *b*, the cumulative distribution when using baskets first-order stochastically dominates the cumulative distribution function for offerings that use bags. For parish *a*, the average fraction for the time period before the outset of the experiment are also depicted. As compared to the pre-experimental period, a shift to giving larger coins occurred in the experimental period.[28] The cumulative distribution function of bag offerings during the experimental period first-order stochastically dominates the cumulative distribution function of bag offerings in the pre-experimental period. Table 4 shows the percentage increase in the share of coins of a certain type (in the total number of coins collected) when baskets are used.[29] The joint-significance test shows that the increase in 1 and 2 euro coins is significant at the 5%-level.

[26] The pre-experimental period comprises the months January and February 2002; the effect of the experimental period may be confounded with the replacement of the Dutch guilder by the euro in January 2002.

[27] A χ^2-test for difference in distributions delivers for parishes *a*, *b* and *c* *p*-values of $9.7 \cdot 10^{-8}$, 0.0559 and 0.0549, respectively.

[28] *p*-value $= 3.3 \cdot 10^{-4}$.

[29] For each type of coin and for each parish, the ratio of the number of coins of a certain type relative to the total number of coins collected was calculated for each offering separately. These ratios were ordered first and second offerings) and significance was tested using a Wilcoxon rank sum test.

INSERT TABLE 4 ABOUT HERE

Comparison of the coin distributions shows that people refrain from giving small coins in favor of giving more valuable ones when baskets are used. Perhaps attendees feel ashamed when giving substandard coins or try to receive social approval by ostentatiously giving large coins. The fact that a similar shift is observed when bag-offerings during the experimental period are compared to bag-offerings in the pre-experimental period, indicates that attendees are to some extent aware that their decisions are observed by the university.[30]

The large effect observed for parish a is remarkable, since it results from observations on first offerings only. In light of the analysis in the previous section this effect is unexpected. Apparently, there is yet some role for social incentives in the attendees' decision to give to the first offering; these are not incentives to give more, but to make the contribution look more. The results in this section compare to the findings by Burnham (2003) who reports an upward shift in modal gift in an experimental dictator game when the anonymity of subjects is removed.

7 Conclusions

This paper set out to investigate whether removing anonymity affects contribution decisions in a real-life environment. For a period of 29 weeks, offerings in thirty churches were randomly gathered either using collection bags or more open baskets. The baskets enable local identification of contributors, giving social incentives like prestige, social approval, shame and social comparison the opportunity to take effect. Furthermore, asymmetric information about the quality of the cause may increase contributions when first-movers can increase the contribution of others by signaling their private information.

I found, first, that non-anonymous collecting methods have a positive effect on contributions to external causes (charity), whereas no effect is found for contributions to internal causes (public good). Second, the effect of removing anonymity peters out over time. Social incentives may have a different impact when the offering serves an external cause, because external causes give more possibilities to exhibit unselfish behavior or because regular bank payments give churchgoers

[30] One treasurer reported that some parishioners in his parish reacted to the research project by saying: "For what reason does the university interfere in our affairs?"

an excuse to contribute less to offerings with an internal cause. This may explain the different effect of the basket-treatment for internal and external offerings. The presence of asymmetric information provides an alternative explanation. Whereas most attendees are familiar with the internal causes, information about the quality of external causes will not be common knowledge. This gives first-movers an incentive to signal private information through their contributions. Within the current framework, we cannot separately identify the effect of asymmetric information and social incentives. A third finding is that in both offerings, people shift to giving more valuable coins when anonymity is removed. This observation is also made for first offerings, which indicates that social incentives are of some importance in contributing to public goods. Feeling ashamed about giving small coins or the desire to receive social approval by giving larger coins might be a possible factor that drives this shift.[31] Note, however, that this result is based on additional data from three churches only.

One caveat should be kept in mind in deriving general policy recommendations for fund-raising institutions from the results presented here. Parishioners may not be representative for the population of interest to fund-raisers because joining church services may correspond to an attitude to giving that differs from that of the population at large.[32]

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[31] Related is the observation by one coordinator who reported that people added to the initial amount of money they took out of their wallet when they noticed that the offering was to be gathered by means of baskets.

[32] Eckel and Grossman (2003) report that active membership in religious organizations is one of the most important determinants of charitable giving. Iannaccone (1998) on the other hand notes that religion seems to matter but that its impact is far from uniform.

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Table 1: Sample statistics independent variables

	mean	median	st. dev.	min.	max.
1st offering (834 obs.)					
total payment (€)	82.698	73.185	61.683	8.120	791.960
per-attendee payment (€)	1.021	0.867	0.780	0.376	16.429
attendees	96.919	76.500	72.989	7.000	443.000
2nd offering (791 obs.)					
total payment (€)	71.450	59.300	59.229	5.110	878.310
per-attendee payment (€)	0.828	0.707	0.497	0.258	5.179
attendees	98.609	78.000	73.380	7.000	443.000

	1st offering	2nd offering
gathering mode		
bag	0.513	0.507
basket	0.487	0.480
plate	0.000	0.008
mug	0.000	0.005
LS open	0.008	0.018
LS closed	0.000	0.019
offerings		
is 2nd	0.948	1.000
is 3rd	0.193	0.204
is exit	0.131	0.113
mission exit	0.067	0.062
simultaneous	0.795	0.837
recommendation	0.054	0.094
relation	0.019	0.034
service		
music	0.064	0.063
family service	0.024	0.023
special service	0.049	0.048
evening service	0.068	0.069
sun	40.132	39.736
Chr. celebration	0.064	0.063
own minister	0.474	0.472
coffee	0.470	0.455
causes		
parish	0.994	0.076
internal	0.001	0.295
federation	0.001	0.556
external	0.002	0.063
Eastern Europe	0.002	0.010
Lord's Supper	0.008	0.037
gratitude	0.008	0.010

Notes: The per-attendee payment is calculated as $\frac{1}{NT}\sum_{i=1}^{N}\sum_{t=1}^{T}\frac{y_{it,j}}{q_{it,j}}$, with $j = 1, 2$; $t = 1, 2, \ldots, T$ for the time period and $i = 1, 2, \ldots, N$ as an index for the churches.
The average value of the euro over the experimental period was about $ 0.94.

Table 2: Per-attendee contributions at the church level

	closed first offerings						open first offerings						difference		Wilcoxon
parish	mean	med.	sd.	min.	max.	#	mean	med.	sd.	min.	max.	#	in mean	t-value	z-value
1	2.41	2.28	0.63	1.57	4.09	*17*	2.77	2.41	0.97	2.01	5.41	*11*	0.36	1.18	0.89
2	0.77	0.79	0.13	0.56	1.05	*15*	0.80	0.76	0.16	0.56	1.10	*13*	0.04	0.68	0.28
3	0.86	0.90	0.13	0.65	0.97	*6*	0.95	0.92	0.13	0.73	1.12	*7*	0.09	1.21	0.93
4	1.00	0.91	0.46	0.62	2.81	*19*	1.32	1.10	0.81	0.83	3.58	*10*	0.31	1.32	2.23*
5	1.67	0.90	1.11	0.75	3.62	*11*	0.88	0.88	0.10	0.74	1.05	*18*	-0.79	-3.02**	-1.28
6	1.00	1.02	0.07	0.88	1.14	*13*	1.16	1.14	0.24	0.74	1.58	*15*	0.15	2.16*	1.70†
7	0.84	0.83	0.16	0.59	1.12	*16*	0.79	0.81	0.06	0.69	0.87	*13*	-0.05	-0.99	-0.59
8	0.79	0.76	0.10	0.62	0.96	*19*	0.78	0.76	0.17	0.63	1.28	*13*	-0.02	-0.33	0.11
9	0.93	0.90	0.17	0.62	1.30	*12*	0.96	0.94	0.11	0.81	1.20	*14*	0.03	0.54	0.85
10	1.17	1.21	0.21	0.81	1.49	*14*	1.17	1.15	0.14	0.93	1.41	*15*	-0.00	-0.05	-0.24
11	0.87	0.80	0.14	0.72	1.20	*15*	1.05	0.74	0.87	0.66	4.00	*14*	0.18	0.79	-1.20
12	0.93	0.96	0.12	0.69	1.16	*14*	0.98	1.02	0.16	0.74	1.29	*15*	0.05	0.91	0.81
13	1.01	0.99	0.22	0.79	1.64	*15*	1.04	1.00	0.14	0.89	1.26	*11*	0.03	0.39	0.73
14	0.51	0.52	0.06	0.41	0.59	*14*	0.44	0.43	0.06	0.38	0.56	*13*	-0.06	-2.74*	-2.45*
15	0.64	0.63	0.08	0.50	0.79	*12*	0.65	0.66	0.12	0.44	0.95	*15*	0.02	0.41	0.41
16	0.67	0.66	0.14	0.43	0.97	*14*	0.71	0.72	0.15	0.48	0.91	*14*	0.05	0.88	0.90
17	0.72	0.70	0.15	0.51	1.09	*16*	0.66	0.70	0.10	0.42	0.80	*12*	-0.06	-1.12	-0.77
18	1.39	1.40	0.35	0.54	1.92	*20*	1.38	1.39	0.23	1.08	1.78	*9*	-0.01	-0.07	-0.26
19	1.04	1.01	0.14	0.84	1.35	*12*	1.00	1.00	0.11	0.82	1.25	*17*	-0.04	-0.89	-0.60
20	0.90	0.87	0.25	0.51	1.51	*20*	0.88	0.83	0.15	0.72	1.22	*9*	-0.01	-0.14	-0.16
21	1.47	1.40	0.24	1.26	2.14	*13*	1.49	1.52	0.29	1.13	2.16	*11*	0.03	0.24	0.41
22	0.81	0.80	0.12	0.66	1.07	*13*	0.95	0.95	0.16	0.69	1.31	*14*	0.14	2.75*	2.40*
23	0.74	0.72	0.12	0.60	1.02	*14*	0.78	0.66	0.34	0.54	1.82	*13*	0.05	0.46	-0.56
24	0.51	0.51	0.07	0.44	0.69	*15*	0.51	0.51	0.08	0.39	0.65	*14*	0.00	0.08	0.15
25	0.63	0.64	0.10	0.38	0.77	*14*	0.65	0.62	0.11	0.50	0.87	*12*	0.03	0.62	0.03
26	0.93	0.81	0.63	0.50	3.05	*14*	0.80	0.84	0.15	0.51	1.02	*14*	-0.12	-0.71	0.39
27	1.35	1.31	0.29	0.94	1.89	*14*	1.46	1.45	0.21	1.14	1.80	*9*	0.11	1.61	1.35
28	0.70	0.69	0.10	0.54	0.86	*9*	0.71	0.67	0.07	0.63	0.86	*19*	0.01	0.15	0.34
29	0.84	0.79	0.33	0.58	1.79	*12*	0.77	0.77	0.12	0.57	1.02	*17*	-0.08	-0.90	0.00
30	1.11	1.03	0.26	0.91	1.92	*15*	1.08	0.94	0.52	0.43	2.60	*13*	-0.03	-0.22	-1.24
mean	0.97	0.92				*427*	0.99	0.94			*394*	0.01		0.93	

Table 2: (continued)

	closed second offerings						open second offerings						difference		Wilcoxon
parish	mean	med.	sd.	min.	max.	#	mean	med.	sd.	min.	max.	#	in mean	t-value	z-value
1	—	—	—	—	—	*0*	—	—	—	—	—	*0*	—	—	—
2	0.64	0.64	0.09	0.45	0.80	*12*	0.69	0.67	0.09	0.52	0.87	*17*	0.05	1.38	1.48
3	0.91	0.72	0.68	0.47	2.84	*10*	0.91	0.92	0.04	0.87	0.94	*3*	-0.00	-0.00	1.94†
4	0.89	0.90	0.19	0.59	1.18	*14*	0.89	0.86	0.28	0.53	1.81	*15*	0.00	0.05	-0.68
5	0.99	0.75	0.69	0.56	3.29	*14*	0.82	0.78	0.13	0.64	1.14	*15*	-0.17	-0.96	0.41
6	0.73	0.74	0.06	0.66	0.85	*12*	0.80	0.83	0.12	0.60	0.97	*16*	0.07	1.91†	1.56
7	0.78	0.72	0.20	0.54	1.33	*13*	0.72	0.70	0.10	0.60	0.91	*15*	-0.05	-0.92	-0.83
8	0.63	0.63	0.10	0.46	0.78	*17*	0.79	0.69	0.45	0.55	2.19	*12*	0.16	1.39	1.17
9	0.82	0.78	0.17	0.59	1.23	*15*	0.86	0.87	0.12	0.61	1.05	*11*	0.04	0.65	1.14
10	0.98	0.97	0.16	0.61	1.19	*12*	1.13	1.07	0.26	0.79	1.72	*16*	0.15	1.78†	1.46
11	0.68	0.65	0.16	0.36	1.03	*18*	0.65	0.57	0.19	0.53	1.17	*11*	-0.03	-0.46	-1.64
12	0.88	0.86	0.18	0.58	1.31	*12*	0.85	0.84	0.15	0.65	1.10	*10*	-0.03	-0.40	-0.30
13	0.79	0.80	0.10	0.59	0.96	*18*	0.93	0.84	0.21	0.75	1.30	*8*	0.13	2.26*	1.64
14	0.51	0.42	0.30	0.26	1.33	*11*	0.40	0.41	0.08	0.27	0.54	*16*	-0.11	-1.39	-0.72
15	0.51	0.50	0.12	0.36	0.80	*10*	0.55	0.56	0.07	0.45	0.67	*17*	0.03	0.95	1.38
16	0.50	0.48	0.11	0.36	0.80	*17*	0.63	0.58	0.12	0.53	0.89	*10*	0.13	2.94**	2.79**
17	0.81	0.64	0.56	0.43	2.38	*10*	0.72	0.71	0.09	0.59	0.89	*15*	-0.09	-0.62	1.30
18	1.22	1.18	0.44	0.34	2.05	*11*	1.73	1.67	0.65	1.16	3.41	*10*	0.51	2.13*	2.01*
19	0.83	0.76	0.23	0.63	1.44	*16*	0.80	0.81	0.11	0.61	1.03	*12*	-0.03	-0.42	0.26
20	0.70	0.66	0.12	0.57	1.09	*17*	0.94	0.92	0.30	0.63	1.63	*11*	0.24	2.90**	1.98*
21	1.08	1.01	0.19	0.93	1.43	*6*	1.19	1.13	0.17	1.05	1.51	*6*	0.11	1.05	1.36
22	0.82	0.78	0.13	0.64	1.07	*14*	0.88	0.90	0.13	0.66	1.17	*13*	0.06	1.10	1.24
23	0.70	0.61	0.40	0.43	1.87	*11*	0.79	0.77	0.25	0.56	1.39	*14*	0.09	0.67	1.94†
24	0.42	0.42	0.04	0.35	0.52	*14*	0.45	0.45	0.04	0.39	0.54	*15*	0.03	1.52	1.55
25	0.46	0.44	0.09	0.36	0.65	*13*	0.57	0.57	0.07	0.44	0.68	*15*	0.11	3.47**	2.90**
26	0.74	0.65	0.38	0.48	1.95	*13*	0.63	0.63	0.12	0.45	0.91	*15*	-0.11	-1.06	-0.69
27	1.22	1.17	0.31	0.96	2.25	*15*	1.13	1.21	0.21	0.70	1.26	*6*	-0.09	-0.65	-0.11
28	0.62	0.63	0.09	0.47	0.80	*12*	0.63	0.61	0.11	0.48	0.95	*15*	0.00	0.09	-0.51
29	0.73	0.65	0.31	0.49	1.53	*14*	0.69	0.67	0.13	0.48	0.94	*15*	-0.05	-0.54	0.68
30	0.60	0.58	0.14	0.41	0.92	*14*	0.67	0.67	0.08	0.54	0.86	*13*	0.07	1.49	1.67†
mean	0.77	0.72				*385*	0.81	0.79				*367*	0.04		4.82**

Notes: Two-sided hypothesis test. † Significant at the 10-percent level; * Significant at the 5-percent level; ** Significant at the 1-percent level. Gratitude offerings and offerings held during or directly after celebration of the Lord's Supper are excluded.

Table 3: Estimation results (standard errors within parentheses).

	OLS				internal 2^{nd} offering	external 2^{nd} offering
	(1)	(2)	(3)	(4)	(5)	(6)
basket 1^{st} (β_1)	0.007	0.003	-0.006	0.028	0.020	0.007
	(0.015)	(0.012)	(0.013)	(0.023)	(0.034)	(0.031)
basket 2^{nd} (β_2)	0.061**	0.041*	0.038*	0.096**	0.043	0.080*
	(0.016)	(0.017)	(0.015)	(0.028)	(0.043)	(0.036)
basket 1^{st} on	-0.009		-0.022	-0.008	-0.032	0.019
2^{nd} off. (β_3)	(0.016)		(0.016)	(0.016)	(0.025)	(0.021)
			change in effect basket 1^{st}			
week 7-12 ($\phi_{1,1}$)				-0.047	0.012	-0.064
				(0.032)	(0.046)	(0.043)
week 13-18 ($\phi_{1,2}$)				-0.054†	-0.068	-0.036
				(0.031)	(0.045)	(0.041)
week 19-24 ($\phi_{1,3}$)				-0.051	-0.041	-0.026
				(0.034)	(0.051)	(0.044)
week 25-30 ($\phi_{1,4}$)				-0.018	0.016	-0.002
				(0.033)	(0.050)	(0.042)
			change in effect basket 2^{nd}			
week 7-12 ($\phi_{2,1}$)				-0.050	-0.026	-0.009
				(0.036)	(0.050)	(0.047)
week 13-18 ($\phi_{2,2}$)				-0.050	-0.027	-0.046
				(0.037)	(0.054)	(0.047)
week 19-24 ($\phi_{2,3}$)				-0.137**	-0.113†	-0.145**
				(0.041)	(0.059)	(0.053)
week 25-30 ($\phi_{2,4}$)				-0.075†	0.035	-0.091†
				(0.039)	(0.057)	(0.049)
			general time effect			
week 7-12 (ζ_1)	-0.011		-0.024	-0.002	-0.038	0.012
	(0.019)		(0.018)	(0.022)	(0.033)	(0.028)
week 13-18 (ζ_2)	0.004		0.007	0.032	0.081*	0.006
	(0.019)		(0.018)	(0.022)	(0.034)	(0.028)
week 19-24 (ζ_3)	-0.019		-0.017	0.022	0.047	0.003
	(0.021)		(0.020)	(0.024)	(0.038)	(0.031)
week 25-30 (ζ_4)	0.028		0.026	0.044†	0.037	0.031
	(0.021)		(0.019)	(0.024)	(0.038)	(0.030)
			service specific variables			
is 3rd	-0.074**		-0.069**	-0.071**	-0.035	-0.081**
	(0.017)		(0.015)	(0.015)	(0.026)	(0.019)
is exit	-0.015		-0.029	-0.032	-0.057	-0.020
	(0.044)		(0.039)	(0.039)	(0.080)	(0.050)
mission exit	-0.015		0.035	0.041		0.077
	(0.074)		(0.087)	(0.087)		(0.137)
simultaneous	-0.043		0.007	0.009	0.016	-0.018
	(0.031)		(0.027)	(0.027)	(0.035)	(0.045)
music	0.012		0.014	0.014	0.019	-0.002
	(0.027)		(0.025)	(0.025)	(0.033)	(0.037)
coffee	-0.011		-0.005	-0.005	0.005	-0.016
	(0.016)		(0.014)	(0.014)	(0.023)	(0.018)
family	-0.054		-0.075*	-0.076*	-0.092	-0.072
	(0.042)		(0.037)	(0.037)	(0.062)	(0.048)
special service	0.005		-0.009	-0.010	0.008	-0.015
	(0.030)		(0.023)	(0.023)	(0.041)	(0.028)
sun	0.000		-0.005	-0.006	-0.033	0.001
	(0.017)		(0.016)	(0.016)	(0.027)	(0.020)
$\ln q$		-0.181**				
		(0.027)				

Table 3: (continued)

	OLS				internal 2^{nd} offering	external 2^{nd} offering
	(1)	(2)	(3)	(4)	(5)	(6)
			1st offering specific variables			
$\ln q$ (δ_1)	-0.277**		-0.271**	-0.268**	-0.177**	-0.317**
	(0.035)		(0.034)	(0.035)	(0.054)	(0.045)
recommendation	0.003		-0.021	-0.017	-0.011	-0.017
	(0.061)		(0.049)	(0.049)	(0.066)	(0.068)
relation	0.018		-0.020	-0.019	-0.111†	0.053
	(0.059)		(0.047)	(0.047)	(0.067)	(0.063)
own minister	0.015		0.022	0.024	-0.014	0.042*
	(0.019)		(0.016)	(0.016)	(0.024)	(0.020)
gratitude	1.123**		1.142**	1.163**		1.193**
	(0.203)		(0.180)	(0.180)		(0.257)
Chr. cel	0.082*		0.086**	0.084**	0.087*	0.032
	(0.035)		(0.029)	(0.029)	(0.036)	(0.048)
evening service	-0.008		0.006	0.001	-0.009	0.025
	(0.044)		(0.029)	(0.029)	(0.046)	(0.040)
			2nd offering specific variables			
$\ln q$ (δ_2)	-0.249**		-0.299**	-0.312**	-0.374**	-0.281**
	(0.037)		(0.041)	(0.042)	(0.063)	(0.054)
own minister	-0.003		-0.004	-0.005	0.002	-0.003
	(0.023)		(0.020)	(0.020)	(0.029)	(0.026)
federation	-0.062**	-0.093*	-0.039*	-0.037†		
	(0.020)	(0.022)	(0.019)	(0.019)		
external	0.040	0.118**	0.074*	0.081*		0.083*
	(0.035)	(0.040)	(0.034)	(0.034)		(0.039)
Eastern Europe	0.228**	0.415**	0.367**	0.372**		0.360**
	(0.080)	(0.118)	(0.100)	(0.100)		(0.109)
Lord's Supper	0.214**		0.098	0.102	0.114	-0.037
	(0.051)		(0.068)	(0.068)	(0.121)	(0.098)
recommendation	0.161*		0.238**	0.244**	0.067	0.350**
	(0.067)		(0.056)	(0.056)	(0.077)	(0.079)
relation	0.182*		0.267**	0.265**	0.293**	0.202*
	(0.074)		(0.062)	(0.062)	(0.087)	(0.084)
gratitude	0.567**		0.604**	0.611**	0.738**	0.088
	(0.088)		(0.073)	(0.073)	(0.079)	(0.230)
Chr. cel	0.208**		0.152**	0.145**	0.257**	0.088
	(0.041)		(0.039)	(0.039)	(0.051)	(0.057)
evening service	0.089†		0.117**	0.102**	0.091	0.084†
	(0.047)		(0.036)	(0.037)	(0.056)	(0.047)
overall effect baskets	0.059	0.044	0.016	0.116	0.031	0.106
[p-values]	[0.057]	[0.030]	[0.743]	[0.014]	[0.660]	[0.085]
difference in effect	0.054	0.038	0.038	0.068	0.023	0.073
[p-values]	[0.011]	[0.084]	[0.025]	[0.047]	[0.650]	[0.098]
Prob F-test						
time effect 1^{st} off.	—	—	—	0.364	0.379	0.563
time effect 2^{nd} off.	—	—	—	0.018	0.155	0.038
Sample size	*1582*	*1582*	*1582*	*1582*	*586*	*996*

Notes: † Significant at the 10-percent level; * Significant at the 5-percent level; ** Significant at the 1-percent level.
Empty cells in columns (5) and (6) mean that there is no variation in the dummy variable in the subsample considered or that the variable is the default value (as "federation" is in column (6).

Table 4: Percentage increase in the share of coins of a certain type (in the total number of coins collected) when baskets are used.

	type of coin		
parish	€0.50	€1	€2
(a)	5.9%	20.4%*	23.2%*
(b)	-2.0%	11.7%*	30.9%**
(c)	3.1%†	2.5%	15.0%**
joint test (p-values)	0.2400	0.0291	0.0001

Note: † Significant at the 10-percent level;
* Significant at the 5-percent level;
** Significant at the 1-percent level
Parish *a*: first offerings only; *b, c*: first and second offerings combined.

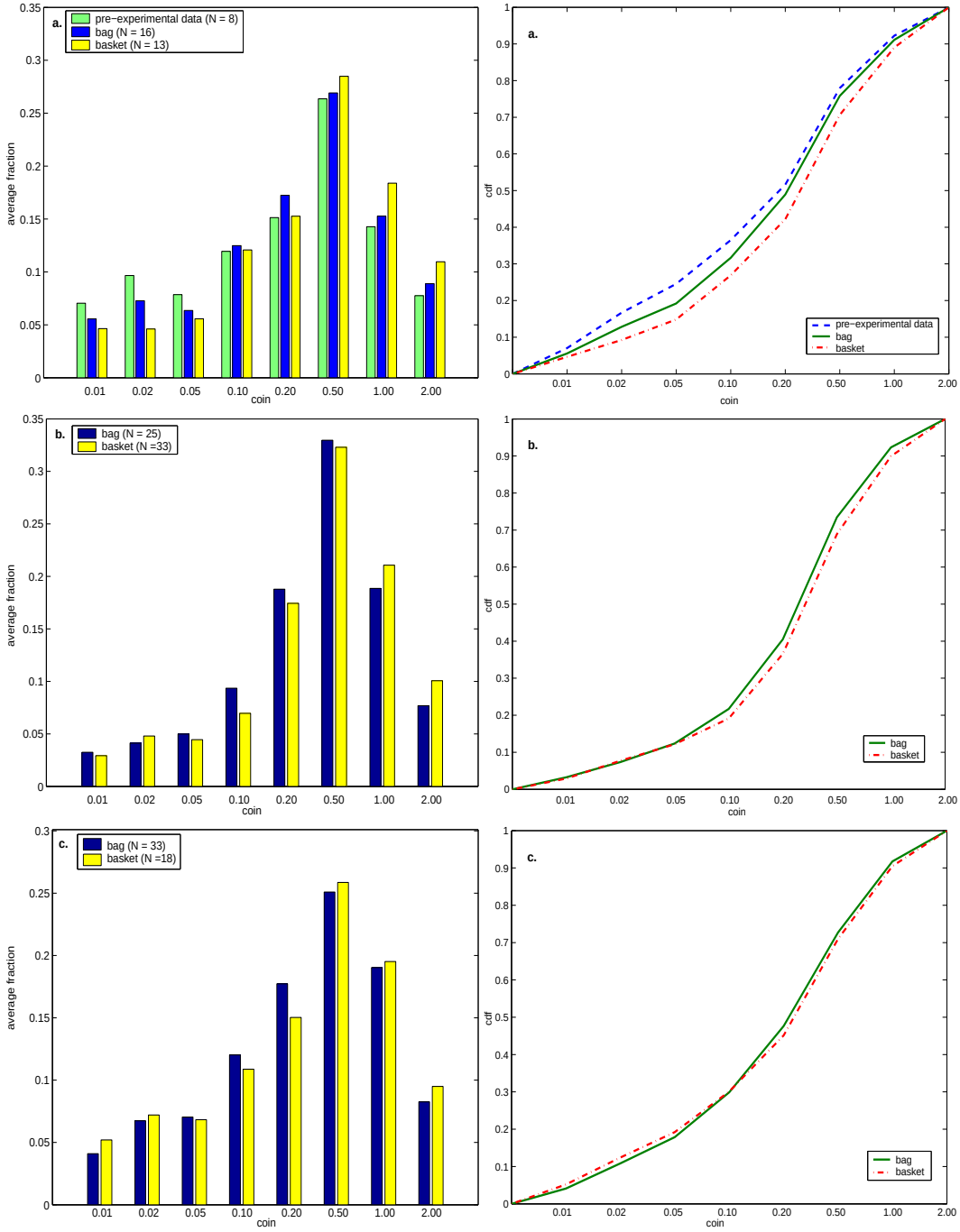

Figure 2: Average number of coins of a certain type as a fraction of the total number of coins given to bag and basket offerings (left panels). Cumulative coin distributions (right panels). Parish *a*: first offerings only; *b, c*: first and second offerings combined.