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EN BEDRIJFSKUNDE**

**TWEEKERKENSTRAAT 2
B-9000 GENT**

**Tel. : 32 - (0)9 - 264.34.61
Fax. : 32 - (0)9 - 264.35.92**

WORKING PAPER

The Role of Seed Money and Threshold Size in Optimizing Fundraising Campaigns: Past Behavior Matters!

Griet A. Verhaert¹

Dirk Van den Poel²

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¹ Dr. Griet Verhaert, Postdoctoral researcher, Ghent University

² Corresponding author: Prof. Dr. Dirk Van den Poel, Professor of Marketing Modeling/analytical Customer Relationship Management, Faculty of Economics and Business Administration, dirk.vandenpoel@ugent.be; more papers about charitable giving/customer relationship management: www.crm.UGent.be

The Role of Seed Money and Threshold Size in Optimizing Fundraising Campaigns: Past Behavior Matters!

Griet Alice Verhaert and Dirk Van den Poel

Griet Alice Verhaert, Department of Marketing, Faculty of Economics and Business Administration, Ghent University, Tweeckerkenstraat 2, B-9000 Ghent, Belgium

Tel: +32 (0)9 264 35 28

Fax: +32 (0)9 264 42 79

Corresponding author: Dirk Van den Poel, Department of Marketing, Faculty of Economics and Business Administration, Ghent University, Tweeckerkenstraat 2, B-9000 Ghent, Belgium

Tel: +32 (0)9 264 89 80

e-mail: Dirk.Vandenpoel@UGent.be

Fundraising appeals often announce that some funds have already been raised in order to reach a certain threshold. This article reports results from a field experiment examining the role of seed money (i.e., no, 50%, and 67%) in combination with threshold size (i.e., low versus high) in fundraising appeals across different targets (i.e., prospects, low fidelity donors, and high fidelity donors). Based on a 2x3x3 between-subjects design we investigate charitable behavior of 25,617 households. Findings reveal a novel qualification of using seed contributions as well as the necessity of a communication differentiation by considering past behavior. We show that seed money works well if the threshold is high but with a low threshold it could have a baleful influence. More specifically, in campaigns targeted at prospects and low fidelity donors, the announcement of seed money increases donations regardless of the threshold level. However, in campaigns targeted at high fidelity donors, seed money is an effective strategy only when the threshold is rather high.

Charitable giving, Differentiated communication, Field experiments, Fundraising, Seed money, Threshold size

1 Introduction

Over the last years, professional fundraisers have utilized a spectrum of possible strategies in order to optimize their direct mail campaigns (e.g. Barzanti et al. 2009). These strategies are mainly focused on the optimization of the target selection (e.g., Malthouse and Derenthal 2008; Malthouse 2010) as well as the solicitation letter (e.g., Berger and Smith 1997). Regarding this latter strategy, an important aspect is related to the announced amount in the donation request (Verhaert and Van den Poel 2011a). Recently, academic literature gives more and more attention to a broad range of techniques that focuses on the announced amount such as the use of rebates (e.g., Eckel and Grossman 2003; Buckinx 2004), refunds (e.g., List and Lucking-Reiley 2002), reciprocity (e.g., Croson, Fatas, and Neugebauer 2005), matching (e.g., Karlan and List 2007; Rondeau and List 2008), conditional cooperation (e.g., Frey and Meier 2004), identity congruency (e.g., Shang, Reed, and Croson 2008), social information (e.g., Reingen 1982; Croson and Shang 2008) and seed money (e.g., List and Lucking-Reiley 2002). Charities often use this last strategy by showing that some funds have already been raised in order to reach a certain threshold to realize the benefaction. Hence, in practice, this strategy is since long the rule of thumb but it has only been recently picked up by few studies. Therefore, the focus of this article restricts itself to the use of seed money in fundraising appeals in order to provide more extensive insight into this strategy.

Seed money, for example in the form of a challenge gift from leadership givers, is an unconditional commitment by a donor, or set of donors, to provide a

given sum of money to the cause (Rondeau and List 2008). In this kind of fundraising appeal, the seed money is announced in combination with a certain threshold that has to be gathered. Consequently, this technique mainly consists of two components: the level or percentage of seed money and the size of the threshold. Whereas previous studies investigated the role of seed money by considering one threshold (e.g., List and Lucking-Reiley 2002; Rondeau and List 2008), we conducted a first study that incorporates different sizes of the threshold in combination with different levels of seed money. In addition, various authors suggest that the effectiveness of direct mail campaigns may differ regarding the loyalty of the customer (e.g., Rust and Verhoef 2005). Previous studies on seed money examined this strategy in either a cold list of prospects (List and Lucking-Reiley 2002) or a warm list of previous donors (Rondeau and List 2008). Moreover, we did not find a study that split up between most and low fidelity donors. Because the impact of seed money across different donor segments has never been studied before, we included different groups (i.e., prospects, low fidelity donors, and high fidelity donors) in our study based on their past donation behavior.

Additionally, a lot of studies on charitable giving are based on laboratory experiments investigating intentions to contribute. However, recently, some academics (e.g., List 2008) stressed the growing importance of field experiments because of the possible discrepancy between the laboratory setting and the field situation. This paper therefore presents results of a large-scale field experiment investigating charitable behavior of 25,617 households. In our setting, we have the added benefit of implementing this controlled experiment in a real fundraising campaign of two charities. Based on each of the original campaigns, we created several versions, each representing an experimental manipulation.

The contribution of this study is threefold. Starting from two recent studies on seed contributions, we compare the previously identified optimal levels of seed money. We include 67% as in the study of List and Lucking-Reiley (2002) and 50% as in the field experiment of Rondeau and List (2008). We also incorporate a control treatment with no seed money. Hence, one contribution of this paper is to investigate whether both former levels of seed money are equally successful. In this respect we can report that both levels are indeed equally effective. Consequently, we build on previous studies and at first glance, our study might be perceived as a replication study. However, in our opinion, previous studies clearly ignored the role of the magnitude of the threshold level in combination with seed money. Therefore, the second and main contribution of this study is that we make new forays into the interaction between the announcement of seed money and threshold level. In other words, is there a difference in contributions when working with a relatively low versus relatively high threshold in combination with and without the announcement of seed money? We answer this question by including a factor with a relatively low (i.e., €3900) or high threshold level (i.e., €11,900). Our empirical results show that both threshold levels result in similar revenues except for appeals targeted at the best donors. Finally, we are the first authors that captured different donor segments into one study. Consequently, the third contribution of this study is to explore whether the announcement of seed money is equally successful when soliciting from cold list of prospects versus a warm list of low fidelity donors versus a warm list of high fidelity donors. In other words, is there a need for differentiation in the communication strategy in accordance with the type of the donor segment when working with seed money? The answer to this question is a definite ‘yes’, because we observe a detrimental effect of using seed money in campaigns with a relatively low threshold towards

the best donors. Our results largely accord with those reported by List and Lucking-Reiley (2002) and Rondeau and List (2008) except for one important novel finding: the identification of an interaction effect between the use of seed money and the level of the threshold in campaigns towards the best donors. In sum, we believe that we are the first authors that showed that seed money does not always increase giving and that the size of the threshold as well as the donor commitment to the organization are important as well.

The remainder of this paper is organized as follows. The subsequent section describes the theoretical background of our study in combination with the formulation of the hypothesis and research questions. This is followed by presenting the design of our field experiment. Next, the corresponding results are summarized and finally, we conclude with implications for further research and practice.

2 CONCEPTUAL BACKGROUND AND FORMULATION OF HYPOTHESIS AND RESEARCH QUESTIONS

2.1 Seed Money and Threshold Level

Andreoni's theory of charitable fundraising (1998) predicts that publicly announced seed money will increase charitable donations from a Nash equilibrium with zero charitable giving to a positive equilibrium level G^* that is greater than or equal to the level of the threshold. More specifically, in the absence of seed money there exists a Nash equilibrium with zero-contribution. This zero charitable giving can be eliminated by initial commitments of seed

money, which lower the residual amount needed to be raised during the fundraising campaign. This theory points to a discretely jump from zero charitable funds to an amount greater than or equal to the threshold level. Consequently, in this theory, seed money is used to eliminate the zero-contribution equilibrium. However, recently, the theory of signaling (Vesterlund 2003; Andreoni 2006) discusses a different effect of seed money by proposing the announcement of seed money as a credibility mechanism rather than an elimination device. This alternative theory for an increase in contributions states that seed contributions signal the quality and value of the charity and reduces uncertainty by potential donors. Notwithstanding the fact that both theories originates from different mechanisms (elimination device versus credibility device) both theories predict that the announcement of seed money leads to an increase in contributions. Therefore, we formulate the following hypothesis in order to test their common prediction.

H1: Appeals with the announcement of a seed contribution yields higher revenues in comparison with the absence of a seed contribution in fundraising direct mail campaigns.

Later on, using Andreoni's theory (1998) as a starting point, List and Lucking-Reiley (2002) were the first authors who evaluated this theoretical model by providing field experimental evidence. These authors tested the use of three different levels of seed money (i.e., 10%, 33%, and 67%) in the context of threshold public goods (i.e., a university capital campaign) targeted at a cold list of prospects where \$3,000 had to be raised for a computer. Based on Andreoni's theory (1998), the authors expected that the revenues should jump from equilibrium of zero to equilibrium of at least the threshold level. However, they

found a continuous increase along the level of seed money. This continuous raise in gift size was unexpected according to Andreoni's theory. However, Andreoni's theory includes the simplifying assumption of complete information assuming that people have complete information about each other's utility functions and thus can predict other's gift sizes with certainty. Therefore, List and Lucking-Reiley (2002) suggested a potential improvement of Andreoni's theory (1998) by introducing incomplete information in order to explain this continuous increase. List and Lucking-Reiley (2002) refers to the fact that in reality, donors may have uncertain ideas of what other donors are giving so donors may play an incomplete-information game. The results of their study indicated that increasing seed money yields more response as well as higher average contributions. Moreover, they found that the 67% of seed money outperformed the other levels. List and Lucking-Reiley (2002) also referred to the study of Vesterlund (2003) as an alternative theory for why seed contributions should raise the funds. This theory of signaling (Vesterlund, 1999) indicates that donors might be uncertain about the quality of the charity and that seed contributions may signal the quality of the charity.

A second field experiment was that of Rondeau and List (2008) who compared the effect of presence and absence of seed money in a real charitable giving campaign. They manipulated a solicitation letter to a relatively warm list of donors (i.e., Sierra Club supporters) for a campaign in an effort to expand their K-12 environmental education program. Their challenge treatment contained 50% seed money, the total amount required was set at \$5,000 and the leadership gift was thus \$2,500. In the high and low control treatments, the announced thresholds were respectively \$5,000 and \$2,500. The authors proved evidence of the superior performance of seed contributions for the reason that the challenge treatment

outperformed both control conditions. Based on the two most favorable levels in previous field experiments, we formulate our first research question as follows:

RQ1: Which of both optimal levels in previous studies leads to the highest total funds raised: 50% or 67%?

However, these previous studies only investigated the seed contribution(s) in combination with one threshold size. We want to address this shortcoming by examining different seed proportions with different threshold levels in order to determine which element is crucial: the seed proportion, the threshold size or both? Therefore, we address the following research question.

RQ2: What is the role of seed money in combination with the threshold size in optimizing charity appeals?

2.2 Past Behavior

Regarding the list of addresses, charities often distinguish between a cold and warm list. The first type is used in case of an acquisition campaign and is meant to attract new donors by sending the solicitation to people who have not contributed to the charity before. These addresses are rented or are obtained by exchange with other charities. The focus of acquisition campaigns is to maximize the response rate rather than to obtain a high average contribution. In contrast, a warm list is mostly used for retention campaigns in which the charity tries to preserve the current donors and to upgrade their donation behavior. Various authors suggest that different types of interventions can have a different impact across customers, depending on their customer characteristics (e.g., De Wulf, Odekerken-Schröder, and Iacobucci 2001; Jonker et al., 2004). Whereas previous studies on seed money examined the role of seed money when soliciting from either a cold list of

prospects (List and Lucking-Reiley 2002) or a warm list of past donors (Rondeau and List 2008), we want to investigate differences across both groups in one study because it might be that the responsiveness to different treatments differs across groups (Karlan and List 2007)³.

Moreover, Rust and Verhoef (2005) identified moderating effects of past behavior on two types of direct marketing interventions. They explored past behavior by examining recency, frequency, monetary value, and length of relationship of customers and showed that the effectiveness of the direct mail intervention differed across the high fidelity and low fidelity clients. For that reason, we do not only distinguish between prospects (i.e., cold list) and past donors (i.e., warm list) but we also want to split up the group of past donors. More specifically, we want to separate the high fidelity donors from the low fidelity ones. Therefore, we define our third research question as follows:

RQ3: Does the use of seed money in combination with the threshold size have a different impact across donor segments (in terms of their past behavior) in fundraising campaigns?

3 Design of the Experiment

This controlled field experiment was conducted in December 2008 during a direct mail campaign of two European charities with a total mailing depth of 25,617 households. We needed to aggregate both datasets to obtain enough observations in each cell of the experimental design, especially for analyzing gift size. The purpose of the first direct mail campaign was to raise funds for building a book and toy library for a children's home. The second campaign was meant to raise

³ Karlan and List (2007) investigated the local political environment and found that a matching gift increases the revenue per solicitation by 55 percent in "red" states whereas the effect was much lower in blue states.

funds to accomplish a humanitarian mission in Africa. Both the building of the library and the humanitarian mission could only be accomplished when a required threshold had been achieved. Although the scope of both campaigns was different, the sentence related to seed money and threshold level was identical, except for the manipulations according to the experimental design (see Appendix for the complete campaign texts).

To ensure that both donor bases were comparable, we investigated their gender, age, socio-economic-status-score and purchasing-power-score⁴. The gender of the donor was derived from the salutation of the donor. By comparing the proportion of males, females and couples between both charities, we found no significant difference ($\chi^2(2, N = 25617) = 1.32, p > .10$) in the proportion of salutation category (cfr., Appendix). In addition, the age distributions are comparable in both charities (cfr., Appendix). The average age of donors of the first campaign was 64.35 years and 63.03 years for donors of the second campaign. Although this difference was significant ($t(19000) = -6.12, p < .001$), the difference is rather small. In other words, it is not the case that we have very young donors in the first campaign and very old donors in the second campaign. Moreover, the socio-economic-status-score ($t(18000) = 1.00, p > .10$) as well as the purchasing power-score ($t(19000) = 0.49, p > .10$) is comparable in both groups.

The main purpose of this study was to investigate the role of threshold size and seed money across different donor segments. For that reason, we set up a randomized 2 x 3 x 3 between-subjects design. The first factor in our design manipulates the level of the threshold (i.e., low versus high) and the second factor

⁴ For this analysis, we asked an external data provider to augment both donor bases with these demographic characteristics.

manipulates the percentage of seed money (i.e., 0%, 50% or 67%). Based on previous research, we expected differences between donors depending on their past behavior. Therefore, the third factor in the design is related to the donor segment based on previous behavior. The first group consists of prospects or people who never donated before (i.e., the cold list based on purchase of names and addresses), whereas the second group contains current donors with a lower fidelity score, and the last group is related to existing donors with a higher fidelity score. As in Rust and Verhoef (2005), past behavioral loyalty was based on the traditional recency, frequency, monetary value, and length of relationship-variables. More specifically, in order to define these two groups of current donors, we use the following behavioral attributes:

1. Number of days between the last gift and the drop date of the campaign
2. Frequency of donations during the past
3. Cumulative amount of donations during the past
4. Number of days since the first donation

We incorporate these four characteristics into one summarizing factor score. For this, higher scores reflect a greater behavioral fidelity, which is indicated by shorter time since last donation, higher number of donations, larger cumulative amount of gifts, and longer relationship duration. Based on a median split⁵, we assigned the donors in the warm list to one of the following two groups: low fidelity and high fidelity segment. Table 1 shows the number of solicitations sent per group.

⁵ First, we will investigate the three groups of prospects, low fidelity and high fidelity donors. The median split was used to rudimentary obtain two groups of fidelity concerning the active donors. This approach allow us to investigate all three segments (including the prospects) in one analysis and also contributes to the practical interpretability. Because the median split leaves potentially interesting information, in 4.4 we investigate the fidelity of active donors more in depth by considering each individual characteristic (i.e., length of relationship, recency, frequency and monetary value) in both segments. In other words, in this section we clarify what drives high versus low fidelity.

Table 1 Experimental design and the number of solicitations

	Cold list		Warm list: low fidelity donors		Warm list: high fidelity donors	
	Low	High	Low	High	Low	High
	threshold	threshold	threshold	threshold	threshold	threshold
No seed	1824	1838	1221	1286	1217	1153
50% seed	1830	1848	1187	1259	1246	1183
67% seed	1831	1816	1212	1251	1225	1190

We designed our solicitation as a threshold that has to be reached without money-back guarantee⁶. The solicitation letter specified that the proposed project would have to be cancelled if some minimum threshold of contributions could not be met. Based on the original campaign, we created six versions, each representing another combination of the level of seed money and the threshold size. Table 2 gives an overview of these six versions:

Table 2 Overview of the six versions

Version	Description	Threshold Size	Seed	Residual money required to reach to threshold
1	Low-no seed	€3900	€0	€3900
2	Low-50	€3900	€1900	€2000
3	Low-67	€3900	€2600	€1300
4	High-no seed	€11900	€0	€11900
5	High-50	€11900	€5900	€6000
6	High-67	€11900	€8000	€3900

⁶ This is in contrast with previous research on seed money (e.g., Rondeau and List 2008). The charities of our experiment refused to work with a money-back guarantee.

We manipulated the size of this threshold by using a relatively low or high threshold. The low threshold of €3,900 was approximately based on amounts used in previous research (Rondeau and List 2008). We used €11,900 as a high threshold. In addition, we implemented three levels of seed money: absence of seed money, 50% and 67% of the money required to reach the goal. These seed proportions were again based on previous research (List and Lucking-Reiley 2002; Rondeau and List 2008). The residual money requested was obtained from subtracting the seed from the threshold. As presented in Table 2, we decided to use round numbers like €3,900, €2,000 €1,300 in the low threshold and for €11,900, €6,000 and €3,900 in the high threshold. Remarkably, we asked for the same residual funds, that is €3900, in the first and last version. The only difference was the use of seed money in the last version.

The six treatment groups were:

1. The 'low control' group, in which the full amount of €3,900 has to be raised.
2. The 'low 50% seed', where €3,900 has to be raised, but where a leading donor has already committed €1,900 in a challenge gift. Consequently, the amount of money required of the solicited individuals was €2,000.
3. The 'low 67% seed', where the announced cost of the good was €3,900 and the challenge gift was set to €2,600. Therefore the remainder was €1,300.
4. The 'high control' group, in which the full amount of €11,900 has to be raised.
5. The 'high 50% seed', with the announced cost of €11,900, but where a leading donor has already committed €5,900 in a challenge gift.

Consequently, the amount of money required of the solicited individuals was €6,000.

6. The 'high 67% seed', where the announced cost of the good was €11,900 and the challenge gift was set to €8,000. Therefore, the remainder was €3,900.

4 Results

To check for outliers, we first conducted a multivariate outlier analysis. We calculated the Mahalanobis Distance on the four indicators of behavioral fidelity, namely recency, frequency, monetary value and length of relationship. On the basis of this analysis we identified 206 outliers for which the observed Mahalanobis distance exceeded the 99.99 % quantile. Furthermore, we excluded another 653 cases that were more than 2,5 standard deviations removed from the mean of one of the four indicators of behavioral fidelity. This remains us with a total of 24758 valid cases.

Table 3 Experimental design and descriptive statistics

Segment	Seed level	Thres hold size	N	N (res ponders)	Response rate (%)	Average gift - Log transforma tion (€)	Revenu per solicitation - Log transforma tion (€)	LOR - number of days sinds first donation	R - number of days since last donation	F - number of previous donations	M - Log transforma tion (€)	Factor Score
prospects	0	low	1824	16	0,88 (0,09)	3,26 (0,49)	0,03 (0,31)					
prospects	0	high	1838	18	0,98 (0,1)	3,22 (0,49)	0,03 (0,32)					
prospects	50	low	1830	19	1,04 (0,1)	3,37 (0,69)	0,04 (0,35)					
prospects	50	high	1848	26	1,41 (0,12)	3,3 (0,43)	0,05 (0,39)					
prospects	67	low	1831	22	1,2 (0,11)	3,13 (0,6)	0,04 (0,35)					
prospects	67	high	1816	30	1,65 (0,13)	3,33 (0,58)	0,05 (0,43)					
low fidelity donors	0	low	1196	62	5,18 (0,22)	3,34 (0,64)	0,17 (0,75)	823,4 (519,52)	439,03 (252,84)	2,21 (1,44)	4,18 (0,79)	-0,7 (0,28)
low fidelity donors	0	high	1255	79	6,29 (0,24)	3,35 (0,66)	0,21 (0,83)	808,43 (525,73)	427,98 (258,02)	2,22 (1,43)	4,19 (0,8)	-0,69 (0,28)
low fidelity donors	50	low	1165	81	6,95 (0,25)	3,35 (0,75)	0,23 (0,88)	821,21 (537,48)	436,82 (246,22)	2,23 (1,45)	4,19 (0,79)	-0,7 (0,28)
low fidelity donors	50	high	1235	84	6,8 (0,25)	3,29 (0,64)	0,22 (0,84)	804,04 (508,78)	431,66 (255,22)	2,18 (1,46)	4,16 (0,8)	-0,7 (0,28)
low fidelity donors	67	low	1191	79	6,63 (0,25)	3,34 (0,74)	0,22 (0,85)	831,49 (525,56)	437,59 (252,83)	2,22 (1,4)	4,2 (0,79)	-0,7 (0,28)
low fidelity donors	67	high	1217	87	7,15 (0,26)	3,22 (0,73)	0,23 (0,85)	810,23 (503,07)	435,3 (253,19)	2,22 (1,42)	4,19 (0,78)	-0,7 (0,27)
high fidelity donors	0	low	1092	177	16,21 (0,37)	3,45 (0,7)	0,56 (1,3)	2574,66 (1103,35)	199,93 (194,09)	10,48 (6,55)	5,67 (0,78)	0,5 (0,56)
high fidelity donors	0	high	1044	138	13,22 (0,34)	3,4 (0,65)	0,45 (1,18)	2609,74 (1094)	194,82 (189,19)	10,76 (6,76)	5,69 (0,8)	0,54 (0,59)
high fidelity donors	50	low	1129	158	13,99 (0,35)	3,33 (0,71)	0,47 (1,19)	2532,57 (1078,49)	190,38 (189,18)	10,72 (6,82)	5,66 (0,85)	0,52 (0,59)
high fidelity donors	50	high	1064	176	16,54 (0,37)	3,35 (0,75)	0,55 (1,28)	2559,91 (1083,53)	194,87 (193,71)	10,65 (6,86)	5,65 (0,84)	0,51 (0,57)
high fidelity donors	67	low	1097	151	13,76 (0,34)	3,39 (0,75)	0,47 (1,2)	2595,61 (1092,5)	199,23 (194,89)	10,53 (6,39)	5,66 (0,84)	0,52 (0,57)
high fidelity donors	67	high	1086	170	15,65 (0,36)	3,39 (0,64)	0,53 (1,26)	2562,21 (1079,99)	193,61 (190,8)	10,74 (6,69)	5,67 (0,83)	0,52 (0,58)

Note: Standard deviations in parentheses

Initially, to have a first impression, we investigated a 3-way Analysis of Variance (ANOVA) on revenue per appeal. The first factor, segment, contained three levels of segment type (prospects vs. less fidelity donors vs. high fidelity donors). The second factor reflected the presence or absence of seed money. The third factor had two levels: low or high threshold. This analysis showed a significant 3-way interaction ($F(2, 24764) = 7.90, p < .001$). Consequently, for simplicity reasons, we discuss the most effective combination of threshold level and seed money by separate analyses for each specific segment. Moreover, the results are presented by discussing the effects of seed money and level of the threshold on each of the dependent measures. The effectiveness, or total revenue, of a fundraising campaign mainly relies on both the response rate and the average gift size. Sometimes, depending on the type of the campaign, one of these elements is to be considered more relevant than the other, as is the case in an acquisition campaign where the maximization of the response rate is of primordial importance. Taking this latter fact into account, we start with reporting the factors affecting the response rate, followed by an assessment of the size of the gift. We finish with a general discussion on the effects on overall revenue. In each of those parts, we compare the different segments: prospects, donors with a low and donors with a high fidelity scores in terms of past behavior. As in Reingen (1982), regarding the analysis of the precise gifts, a $\log(X + 1)$ transformation was first performed on the data.

4.1 Participation Rate

Table 4 Summary results of response rate for all treatments

	Cold list		Warm list: low fidelity donors		Warm list: high fidelity donors	
	Low threshold	High threshold	Low threshold	High threshold	Low threshold	High threshold
No seed	0,88%	0,98%	5.18%	6.29%	16,21%	13.22%
50% seed	1,04%	1.41%	6.95%	6.80%	13.99%	16.54%
67% seed	1,20%	1.65%	6.63%	7.15%	13.76%	15.65%

Table 4 summarizes the response rates per group per version. For the dependent measure of response rate, we used the GLIMMIX⁷ procedure in SAS in which we specified that the dependent variable is binary. First, looking at the results of people in the cold list, we investigated the use of seed money (absent vs. present) and threshold size (low vs. high) as independent measures. This analysis revealed a main effect of using seed money ($F(1, 10983) = 3.00, p = .083$) but no threshold effect ($F(1, 10983) = 1.12, p = .290$) nor an interaction effect between seed money and threshold size ($F(1, 10983) = 0.26, p = .612$). More specifically, the announcement of seed money has a positive influence on the participation rate. The response increases from 0.93% to 1.32% just by adding seed money to the campaign ($t(8551) = -1.91, p = .056$)⁸. If we take a closer look at the individual levels of seed money we find that as we increase the seed money from zero to 67% of the threshold, the number of received donations also increases with 54% ($t(6990) = -1.97, p = .049$). These results are in agreement with those reported by List and Lucking-Reiley (2002) and Rondeau and List (2008) who also found an increase in response rate by using seed money. Moreover, we can conclude that the proposed optimal level in both studies, respectively 50% and 67%, is equally effective ($t(7272) = -0.76, p = .449$). In analogy with the study of Rondeau and

⁸ We obtain these percentages by aggregating the two levels of seed money into one category.

List (2008), we also did the novel experimental comparison between the low threshold control treatment and the high threshold 67% seed condition where the remaining requested amount remains constant⁹. The number of donors just about doubles when asking the same amount, merely by the announcement of seed money ($t(3325) = -2.09, p = .037$), this clearly demonstrates the vital importance of seed money in acquisition campaigns.

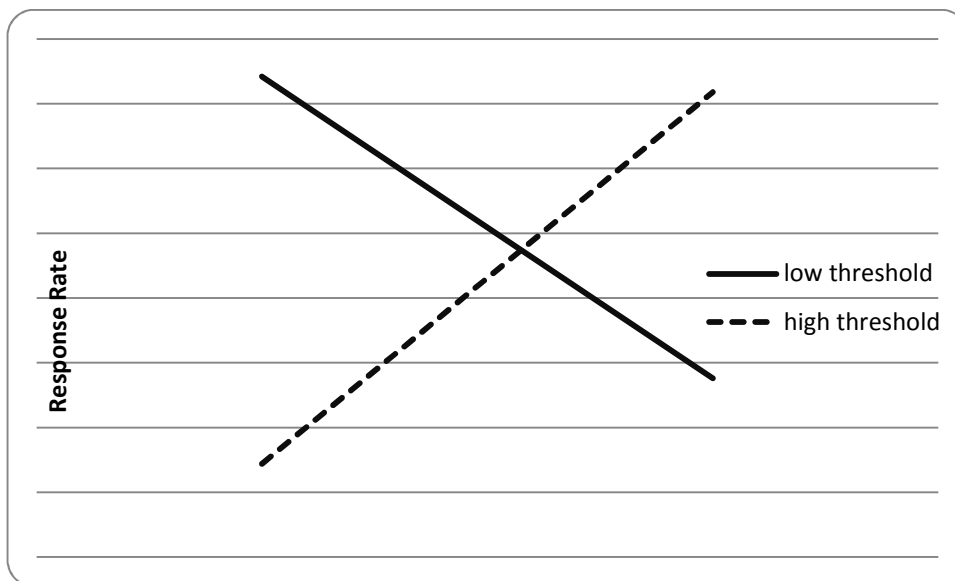
When we now consider the behaviorally low fidelity donors of the warm list, we found the same pattern as in the cold list with a main effect of seed money ($F(1, 7255) = 3.62, p = .057$) on participation rate but no threshold effect ($F(1, 7255) = 1.26, p = .261$) nor an interaction effect ($F(1, 7255) = 0.72, p = .395$). More specifically, announcing seed contributions increases the response from 5.75% to 6.88% ($t(5310) = -1.90, p = .058$). In addition, levels 50% and 67% are equally effective ($t(4806) = -0.03, p = .980$). The difference between both treatments with the same amount requested remained significant ($t(2370) = -2.01, p = .045$), indicating the importance of seed money for customers in this segment. These results are in accordance with the results of the cold list and in line with previous work by List and Lucking-Reiley (2002) and Rondeau and List (2008).

The third segment we analyzed on ground of participation rate contains the best donors of the organization. We neither found a main effect of seed money ($F(1, 6508) = 0.10, p = .748$) nor a main effect of the size of the threshold ($F(1, 6508) = 0.19, p = .663$). Interestingly, this analysis showed a significant interaction effect between the use of seed money and size of the threshold ($F(1, 6508) = 7.65, p = .006$). This finding differed from both our results regarding the other segments and previous research, reviewed earlier in this article. However, we want to remark that previous studies reached response rates much lower (i.e.,

⁹ Although the same effect occurred, the amount required in Rondeau and List (2008) was \$2,500. In our study, the amount was set to €3,900 (almost \$5,000).

below 5%) than we obtained in our high fidelity segment (i.e., around 15%) which suggests that this type of segment has never been studied before. Figure 1 shows the interaction between size of the threshold and the use of seed money. As can be seen in the graph, using seed money is not always the best strategy because of the moderating effect of the threshold size. When the threshold is a relatively low amount, it is ineffective to announce seed contributions in the fundraising appeal. On the other hand, seed money remains a good technique when the threshold is rather high. This means that the residual money required should be high enough in appeals towards the best donors. Regarding the precise percentage of seed money, we did not find a difference between 50% and 67% ($t(4374) = 0.49, p = .626$) indicating that both levels are equally effective.

Figure 1 High fidelity donors: interaction between threshold size and use of seed money



4.2 Size of the Gift

Table 5 Summary results of size of the gifts for all treatments (log transformed)

	Cold list		Warm list: low fidelity donors		Warm list: high fidelity donors	
	Low threshold	High threshold	Low threshold	High threshold	Low threshold	High threshold
No seed	€3.26	€3.22	€3.34	€3.35	€3.45	€3.40
50% seed	€3.37	€3.30	€3.35	€3.29	€3.33	€3.35
67% seed	€3.13	€3.33	€3.34	€3.22	€3.39	€3.26

Results with regard to the average gift are presented in Table 5. The analysis of the size of the individual contributions revealed that neither seed money nor the magnitude of the threshold influenced the amount of the individual contributions. This result holds for all segments of the field experiment. This finding is in contrast with the results of List and Lucking-Reiley (2002) who indicated that the average gift size rises when seed money increases¹⁰. However, our results are in accordance with those reported by Rondeau and List (2008). They did not find a significant difference in individual gift size between the challenge treatment and the control group with the same threshold. But, in contrast with these authors, we did not find a difference in gift size between challenge treatment and the control group where the same residual amount was requested.

4.3 Total Raised Funds

Table 6 Summary results of the revenue per solicitation (log transformed)

	Cold list		Warm list: low fidelity donors		Warm list: high fidelity donors	
	Low threshold	High threshold	Low threshold	High threshold	Low threshold	High threshold
No seed	€0.029	€0.032	€0.173	€0.211	€0.559	€0.450
50% seed	€0.035	€0.046	€0.233	€0.223	€0.466	€0.554
67% seed	€0.038	€0.055	€0.221	€0.230	€0.467	€0.531

¹⁰ Although we want to remark that there was no treatment without seed money in the study of List and Lucking-Reiley (2002).

As shown in Table 6, the announcement seed contributions results in higher overall contributions by the cold list segment. As was the case in the study of Rondeau and List (2008), this influence of seed money on total revenue is driven by an increase in response rates when announcing seed money for the same threshold. The same conclusion holds for sending a campaign to the low fidelity donors. Regarding the best donors of the charity, there is again a significant interaction effect when analyzing the total revenue ($F(1, 6508) = 8.01, p = .005$). Consequently, the revenue is also driven by the response rate rather than by the size of the gift. Moreover, this interaction effect determines the overall revenue due to the lack of a main effect of seed money and the size of the threshold. This means that in order to optimize a campaign targeted at the high fidelity donors, the use of seed money depends on the size of the threshold. We find it remarkable that, in case of a low threshold, when seed money is used, there are fewer funds raised than there was when we omit seed money. This result clearly indicates that announcing seed money is not always the best technique and can as such lead to missed funds when soliciting from the best donors. This also points out that the required amount has to be large enough to signal the true need towards the best donors.

a. Fidelity Characteristics of the Warm List

In the previous sections, we investigated the impact of seed money and threshold level on campaign success rate across three different segments. We considered a cold list of prospects and for active donors in the warm list, we distinguished between high fidelity and a low fidelity donors based on a summarizing index. In general, we found that seed money is not always a good strategy. More specific,

for high fidelity donors, it is better not to announce seed money when the threshold is rather low. Since we have more detailed information (i.e., length of relationship, recency, frequency and monetary value) available concerning the individuals in the warm list, we will now investigate the relevance of each specific personal variable. To investigate fidelity more in depth, we estimated separate ordinary least squares regression models with revenue per solicitation as a function of the announcement of seed money, threshold level, the specific individual characteristic involving fidelity, and their interactions. We focus on revenue per solicitation because of the practical relevance of this dependent measure in campaigns towards active donors. The usual requirement for developing a regression equation that includes three-way interactions is that all first order and second order terms must be included in the equation (Aiken and West 1996). In addition, we mean centered the predictor variable concerning fidelity to maximize interpretability (Dawson and Richter 2006). The regression results are reported in Table 7. Each column reflects the results of the regression analysis for each specific variable concerning fidelity. We included the standardized coefficients (beta) because the measurement level differs across the variables in the regression. Based on our previous findings, we expect an interaction effect between seed money, threshold level and the variable reflecting fidelity. Except for the analysis concerning recency, every regression resulted in a significant three-way interaction between the three explanatory variables. This is consistent with our previous findings and indicates that an effective level of threshold and seed money depends on the length of relationship, the frequency as well as the monetary value of the donor.

Table 7 Regression results (OLS, dependent variable=dollars donated; log transformed)

	length of relationship	recency	frequency	monetary value
seed money	-0.007(0.027)	-0.008(0.027)	-0.012(0.027)	-0.008(0.027)
threshold	-0.02(0.031)	-0.019(0.031)	-0.023(0.032)	-0.019(0.031)
Fidelity	0.087(0)**	-0.164(0)**	0.198(0.003)**	0.194(0.02)**
seed money*threshold	0.034(0.038)**	0.033(0.038)*	0.04(0.039)**	0.034(0.038)**
fidelity*seed money	-0.019(0)	0.016(0)	-0.028(0.004)	-0.046(0.025)**
fidelity*threshold	-0.053(0)**	0.023(0)	-0.034(0.005)	-0.049(0.028)**
fidelity*threshold*seed money	0.041(0)**	-0.033(0)	0.044(0.006)**	0.05(0.034)**

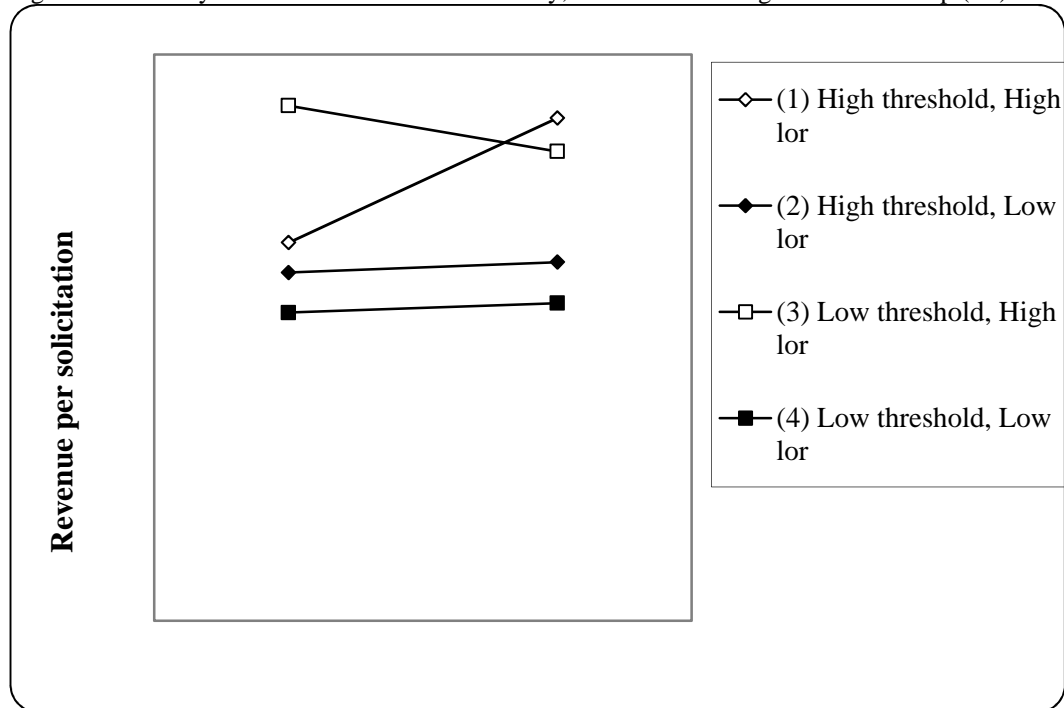
Note: Standard errors in parentheses

*Significant at, or below, 10 percent

**Significant at, or below 5 percent

We will now discuss each specific fidelity variable more in depth. Table 7 suggests a significant three-way interaction term for seed money, threshold level and the length of relationship of the donor ($\beta = 0.041$, $p < .05$). This implies that length of relationship moderates the interactive effect of seed money and threshold level. However, to further investigate this finding, additional analyses were required. First, we plotted the three-way interaction in Figure 2 (for this procedure, see Aiken and West 1996). The plot shows that in campaigns with a high (low) threshold towards donors with a higher than average length of relationship ($\mu_{\text{lor}} = 1646.54$), the revenue per solicitation increases (decreases) when seed money is announced. However, the plot also suggests that there are no harmful effects of announcing seed money in campaigns towards donors whose first payment was lower than 1646 days ago. Second, to shed more light on the significant three-way interaction, we performed a slope difference test (Dawson and Richter 2006). This test revealed that the slope of line 1 (see Figure 2) and line 3 are significantly different from each other ($t = 2.51$, $p < .05$). All other slopes did not differ from each other. This finding indicates that in campaigns with a low threshold towards donors with a higher length of relationship, it is better not to announce seed money.

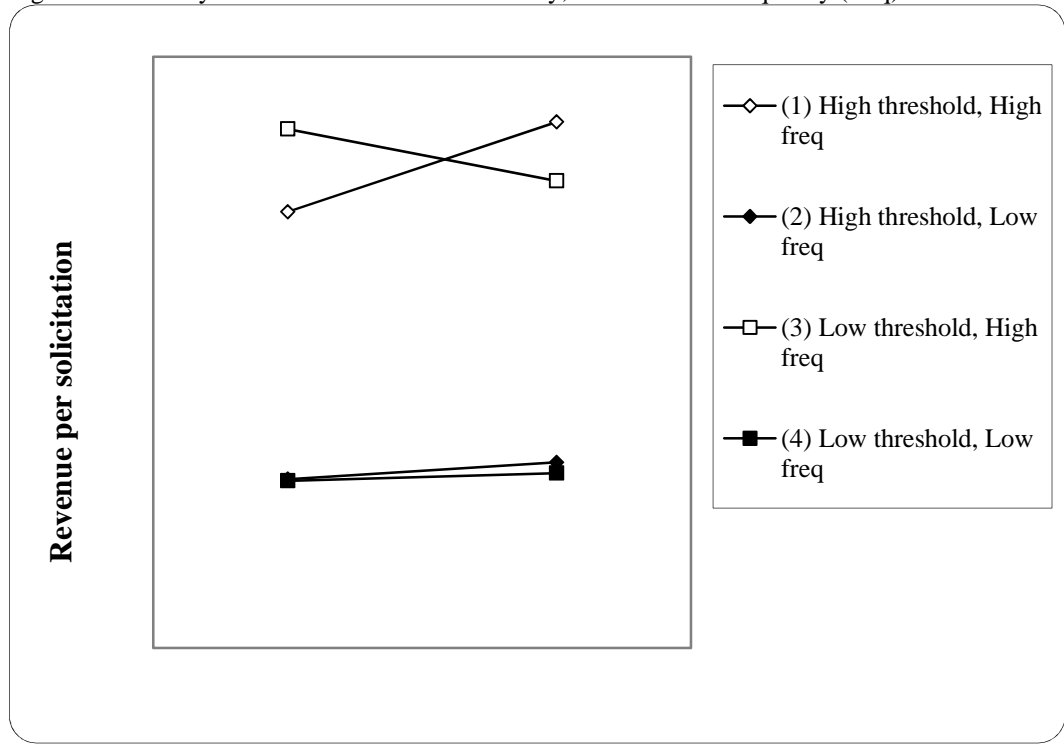
Figure 2 three-way interaction between seed money, threshold and length of relationship (lor)



As can be seen in Table 7, the interaction term for recency with seed money and threshold level is not significant ($\beta = -0.033$, $p > .10$). This indicates that it is not necessary to take into account the recency of the donor in optimizing the content (in terms of seed money and threshold level) of the appeal.

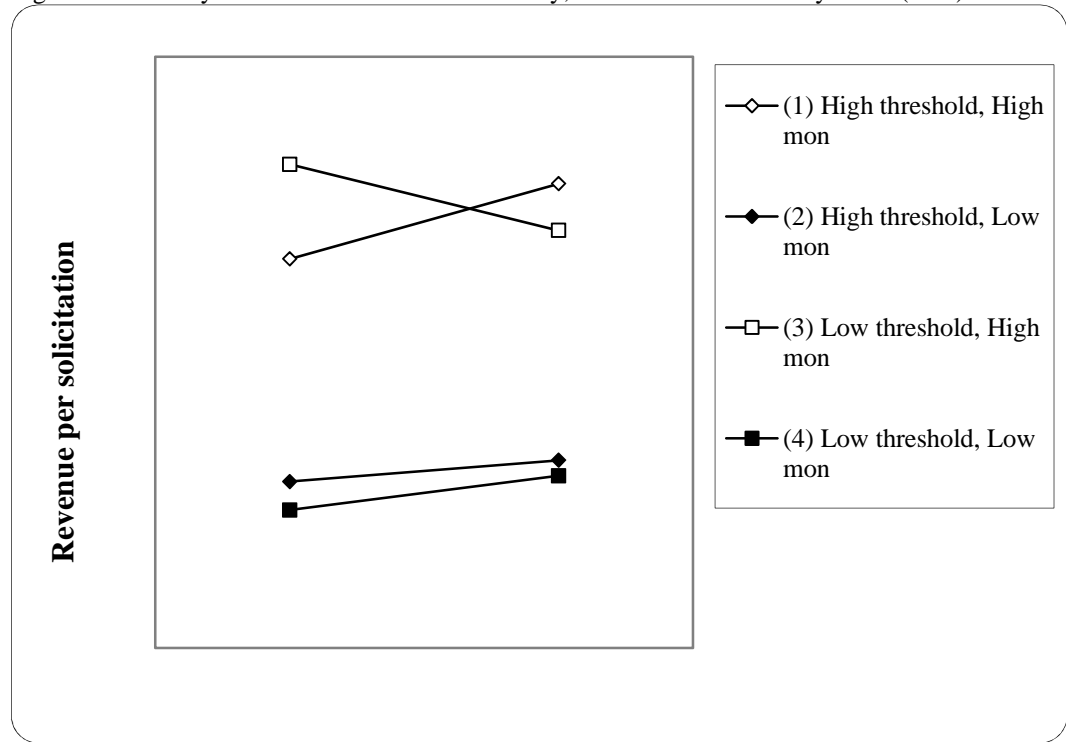
Concerning frequency, Table 7 shows that the three-way interaction is significant as well ($\beta = 0.044$, $p < .05$). To sharpen our understanding of this result, we plotted the interaction term. Figure 3 shows that seed money has a positive effect on revenue per solicitation in campaigns with a high threshold or in campaigns towards people with a lower frequency than 6.20, whereas this effect becomes negative in campaigns with a low threshold towards people with an higher frequency than average. Moreover, the slope difference test only performed significant for the comparison of the slope of line 1 and the slope of line 3 ($t = 2.12$ $p < .05$). These results also provide support for our previous findings.

Figure 3 three-way interaction between seed money, threshold and frequency (freq)



The monetary value (log transformed) of the donor also seems an important characteristic to take into account when optimizing the content of the appeal. As shown in Table 7, this three-way interaction term is significant ($\beta = 0.05$, $p < .05$). Figure 4 illustrates this effect and shows that in campaigns with a low threshold towards people with a higher monetary value than average ($\mu = 4.89$), it is better not to announce seed money. In all other campaigns, seed money can be announced. Again, the slope between line 1 and line 3 differs significantly ($t = 4.07$ $p < .001$) indicating the interaction effect between seed money and threshold for donors with a higher monetary value and thus high fidelity donors.

Figure 4 three-way interaction between seed money, threshold and monetary value (mon)



4.5 Conclusion

The model of multiple-goal pursuit proposed by Louro, Pieters and Zeelenberg (2007) provides a valuable explanation for this effect. Helping others by donating money on a regular basis to the charity reflects a goal of individuals with high fidelity towards the charity. However, these donors might simultaneously pursue multiple goals in their everyday life and therefore selectively allocate effort between multiple goals over time. Mentioning a threshold in the solicitation letter is the focal goal and the presence or absence of seed contributions indicates whether or not the goal is progressing, respectively resulting in positive or negative emotions. The residual money needed to reach the goal reflects whether goal attainment is near. This residual money is lowest with a low threshold in combination with seed money indicating that the goal is very close. This high success expectancy leads to a decreased effort towards the focal goal and increased effort towards competing goals. In contrast, in case of a high threshold with seed money, the goal is still remote but the moderate success expectancy

results in an increased effort in the focal goal by diverting resources from other goal pursuits. However, when seed contributions are omitted, negative emotions lead to decreased effort towards the focal goal when this goal is still remote (i.e., high threshold and highest residual money) because of low success expectancy. According to Louro et al. (2007), these negative emotions prompt increased effort towards the focal goal when the goal is near (i.e., low threshold) because of moderate success expectancy. In summary, the individuals' expectancy of success is important because effort to the focal goal is highest for intermediate levels of success expectancy and lowest for either low or high levels. This explanation is also consistent with Atkinson's (1957) motivation theory and only holds for high fidelity donors who proved that the charity is important to them reflecting a personal goal. People who never contributed before or people who have a low fidelity should be more affected by cues like credibility mechanisms in order to reduce their uncertainty. For these segments, the theory of signaling (Vesterlund 2003; Andreoni 2006) explains the positive influence of announcing seed money regardless of the threshold level.

In general, by showing an increase in revenue when using seed money, our results provide evidence for our first hypothesis. However, we found one exception: seed money does not increase revenues in appeals with a rather low threshold targeted at the high fidelity donors. By investigating our first research question, we found that 50% as well as 67% seed contributions are equally effective. The answer to our second and third research question is that, for new and low fidelity donors, the use of seed money has a positive influence on the contributions despite the size of the threshold level. There is however an important qualification. Seed money is a good strategy, except for appeals with a

rather low threshold targeted at the high fidelity donors. Finally, we demonstrate thus a need for differentiation when communicating seed money in the solicitation.

5 Discussion

The results of this experimental study contribute to the extant literature on the effectiveness of seed money in fundraising appeals. Based on a field experiment in two fundraising campaigns sending 25,617 solicitation letters we examined the role of seed money and threshold size on charitable giving in three different donor segments: prospects, donors with low fidelity scores, and donors with high fidelity scores. On the one hand, our approach is unique in making a differentiation across donor segments by analyzing past behavior. On the other hand, it is the first study that explores the role of the threshold size in combination with seed money. It is, however, important to note that this study is not intended to capture the entire range of perspectives on important issues when working with seed money.

Taking the research of List and Lucking-Reiley (2002) and Rondeau and List (2008) as a starting point, our study of seed money in charitable direct mail campaigns yields several findings. First of all, not unexpectedly, the announcement of seed money leads to a higher response rate, and consequently higher revenues, for both acquisition campaigns and solicitations towards low fidelity donors. In this kind of campaigns, the size of the threshold does not play a crucial role. In contrast, when analyzing the best donors of the charity, we identified neither a main effect of seed money nor a main effect of the threshold level. But, a predominating interaction effect between the use of seed money and the level of the threshold occurs. More specifically, only when announcing a relatively high threshold, we do find the same patterns as in the cold list segment

and in the segment of low fidelity donors. However, regarding this high fidelity segment, one of the most remarkable results is that a campaign focused on a relatively low threshold is better off working without seed money. In addition, we investigated the individual characteristics of fidelity more in depth and we found that length of relationship, frequency and monetary value are the drivers behind this difference in fidelity.

Although this study is not the first to examine the role of seed money in charity appeals, its design adds external validity and important modifications to earlier findings in academic research. We agree with previous research that seed money is definitely a good strategy when soliciting from both a cold list of prospects and donors that have a low behavioral fidelity. However, one crucial difference with prior studies and our study is that seed money is only an efficient strategy with the best donors when the threshold is high enough. This finding is a novel qualification of Andreoni's (1998) theory on charitable fundraising who suggests that seed money is generally a good strategy. Therefore, in direct mail campaigns targeted at the best donors, we advise being careful when announcing seed contributions. We believe our findings could be explained by Louro et al.'s (2007) model of multiple-goal pursuit indicating the importance of the individuals' expectancy of success. Another explanation might be referring to what extent do people want to feel needed and to what extent is that feeling needed different for diverse donor segments. For example, for the high fidelity donors, it could be that if you already collected a lot of money it seems like a lot of people are contributing and that this makes them feel less needed because you already have a lot of money. However, for the low fidelity segment it could just be the opposite. For example, this donor segment may just want to know whether they really can make a difference (i.e., "Am I the one?"). Or, if the low fidelity donors who didn't

donate for a while see that a lot of people donated before, it can be easier to become active again because the announcement of seed money indicates then that it is the right time to move to donating again. Therefore, an interesting opportunity for further research is to investigate more in depth whether different segments are dealing with different perspectives explaining the interaction.

Considering the previously discussed results, we would highly recommend a cautious differentiation strategy, taking into account the level of the threshold at hand. Seed money is definitely a good strategy when the threshold is high enough but in combination with a relatively low threshold it could have a baleful influence. Hence, our results recommend considering the size of the threshold when investigating the role of seed contributions. Especially when focusing on high fidelity donors of the charity. In addition, research on the effectiveness of fundraising campaigns must take into account the past behavior of the target. For this, a link with the database of the charity is of vital importance.

The findings also have practical implications. We demonstrate different effects according to the donor segment indicating a need for differentiation in the communication strategy. By showing an interaction effect between the use of seed money and size of the threshold, the results suggest that when professional fundraisers want to optimize their campaigns, attention must be focused on the size of the threshold. In general, announcing seed money is always a valuable strategy except when raising funds for a relatively low threshold. In this latter situation, it is more efficient not to announce seed money in appeals towards the best donors because of its detrimental effect. Or, in other words, for high fidelity donors the residual money required should signal a necessity that is large enough in order to encourage them to contribute. However, more research on the size of the threshold is needed here. It would be interesting to investigate if our results

hold for different levels of thresholds. Expanding this experimental design in other fundraising situations could also be a fruitful area for further research. Incorporating a reactivation campaign in the experimental design could prove useful too. Finally, it would be worthwhile to further explore the question of which level of seed money best works with which level of threshold. What happens when the percentage of seed money is higher than 67 percent? We advice further researchers to investigate more variance in the manipulations to examine possible non-linear effects. Another issue is to investigate how donors exactly perceive the size of the threshold. In other words: is the €11,900 being perceived to be high and the €3,900 as low? Moreover, another limitation of this study is that we aggregated data of two fundraising campaigns to obtain enough observations in each condition. Although both populations are comparable, the goal and topic of both campaigns differed. Consequently, further research needs to investigate this more in depth by testing different goals of fundraising campaigns on large sample sizes to provide insight in how the specific goal of the campaign affect the results.

Moreover, our predictive models did not include psychographic variables. Further research could focus on including variables such as empathy (Verhaert and Van den Poel 2011b), which are known to help predicting donation behavior.

In addition, an interesting opportunity for further research is to investigate whether our results can be generalized to other fields and to investigate other applications related to the announcement of seed money. A nice illustration may be KIVA¹¹. KIVA empowers individuals to lend to an entrepreneur across the globe. By combining microfinance with the internet, KIVA is creating a global community of people connected through lending and on their website they

¹¹ www.kiva.org

announce how much money have already been raised for each specific project.

Another example might be related to volunteer helping behavior. If someone asks, by inviting his friends, on Facebook to help one weekend with his renovation, you can see how many friends are attending. It could be that more loyal friends are likely to confirm when they see that there are not a lot of volunteers yet. While for less loyal friends it may be that they first need to see that a lot of people are joining. The applications of this study may even go beyond non-profit. For example, our findings may have implications for realtors because real estate agents often mention how much of the properties are sold (e.g., 'We already sold 50% of the apartments'). They never announce that 5% of the apartments are sold. It can be interesting to explore the optimal proportion in this context and investigate, for example, what happens at 90%. Maybe people are not encouraged anymore because they can only visit the property in three days or they just may be very interesting because they really want the property. As we show that for prospects it is better to announce seed money, our results might have implications for starting companies. For example, If you start up a company creating websites, to convince new clients, it might be more convincing when you can show a lot of references rather than when you have no clients yet. Moreover, based on the results, we could expect that if you want to try a new restaurant and there is no people inside, you probably may look for another restaurant while for high fidelity clients, when the restaurant is almost full, they may not be interested anymore.

In conclusion, this research is the first to demonstrate the effect of both seed money and size of the threshold on charitable contributions across donor segments. It reveals an important qualification of the announcement of seed money. For practitioners, it clearly shows the necessity of a differentiation in direct mail appeals by considering past behavior of their donors.

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APPENDIX

