Coordinating Donations via an Intermediary: The Destructive Effect of A Sunk Overhead Cost

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Abstract

Donors often use the services of an intermediary to prevent their donations from being too thinly distributed over multiple public projects. We explore whether donors' willingness to coordinate their funds via an intermediary depends on the extent of the intermediary's discretion over their contributions, as well as the organizational overhead costs incurred by the intermediary. We investigate this using a laboratory experiment in which donors face multiple identical threshold public goods and the opportunity to coordinate their contributions via another donor assigned to the role of intermediary. In line with standard game theoretic predictions, we find that donors make use of the intermediary only when they know she is heavily restricted in terms of the proportion of their contributions she can expropriate for herself. However, we find strong evidence that the positive effect of these restrictions is undone once the intermediary incurs a sunk overhead cost. Our analysis suggests that the ex-ante inequality created as a result of this sunk cost reduces the trustworthiness of the intermediary in the donors' eyes, which in turn reduces the donors' willingness to use the intermediary to coordinate their contributions effectively.

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1 Introduction

Voluntary donations are the lifeblood of non-governmental organizations (NGOs) and they play a vital role in the successful implementation of social projects in different domains, ranging from education and healthcare to poverty alleviation and environmental protection. They also help shape our culture and society, providing the funds necessary to sustain political, recreational, and sports organizations across the world.

Considering a situation in which multiple NGOs coexist and promote similar projects, donors not only need to give generously but must also coordinate their financial efforts on the same NGO lest their donations become too thinly distributed over multiple initiatives and eventually wasted. Indeed, such miscoordination over the possible alternatives is likely to substantially reduce the positive effects of donors' generosity and ultimately discourage contributions altogether. The interplay between contribution and coordination represents an intriguing research question in the economic literature. By extending the standard threshold public good setting, Corazzini, Cotton, and Valbonesi (2015) (henceforth, CCV) show that increasing the number of alternative public goods can discourage subjects' contributions and increase the probability that all public goods fail. CCV provides experimental evidence in favor of the anecdotical argument that "too many of the new nonprofits are just too weak" (Light & Light, 2006, p. 59) and unable to survive in a context characterized by narrow budget constraints and scarce resources.

When multiple alternatives are at stake, providing donors with an effective coordination device becomes of vital importance. With this in mind, Corazzini, Cotton, and Reggiani (2020) (henceforth, CCR) experimentally study the effect of giving subjects the opportunity to contribute through an intermediary rather than directly to the alternative public goods. Their main result is that the use of an intermediary increases public good success and subjects' earnings but only when the intermediary is formally committed to direct 100% of the contributions received from donors to the public goods. The use of an intermediary resembles a common real world situation in which donors may transfer their resources to a Community Chest (i.e., an intermediary), who then pools their funds and directs it toward funding one of the projects successfully. Since a Community Chest is typically composed of members of the community who may themselves be donors, this setting differs from those in which intermediaries have more information than the donors about the quality of the different alternatives.[1]

While a pioneering study, the set-up in CCR does not take into account certain crucial aspects of donating via an intermediary namely, i) the overhead costs incurred by the intermediary in collecting and deploying donors' funds, and ii) the possibility for the intermediary to *expropriate* some amount of the donors' funds for herself. The aim of the present study is thus to deliver insights into how the donor's and intermediary's behavior are affected by these real world features.

With respect to the first aspect, we introduce an overhead cost on the intermediary as an exogenous sunk cost that has already been incurred prior

[1] We note here that in our experiment, we cannot address questions of how donors and intermediaries would behave in cases where it is clear the intermediary has more or better information than the donors do about the quality of different investments.

to fundraising. As such, the size and presence of this overhead cost cannot signal anything to donors about the quality (or trustworthiness) of the intermediary or about the quality of the available public goods. Outside of the laboratory, while donors do sometimes consider the the size of the overhead cost or overhead ratio to be an indicator of a charity's quality[2], this perception of the overhead costs is often misleading[3]. Overhead costs typically consist of administrative or fundraising expenses that cannot be attributed to any direct program expenses (Meer, 2017) and hence are unrelated to how donors' funds are deployed to address the charity's actual mission. The actual size of overhead costs relative to overall revenues of the charity also often varies quite widely.[4] Our implementation of the overhead as a sunk cost captures its inability to signal anything about the quality of the intermediary in our experiment. Our objective in exogenously manipulating whether or not the intermediary incurs this cost is to understand whether donors in our setting are averse to these costs *despite* this.

The second crucial aspect that improves on the setting in CCR is that we consider the effect of destination rules that leave a certain level of discretion to the intermediary. With regard to this dimension, CCR only considers one extreme case in which the intermediary is constrained by a 100% destination rule to contribute the entirety of the donors' transfers to her to the public goods. While donors may prefer this to be the case (Barman, 2007, 2008; Grønbjerg, Martell, & Paarlberg, 2000; Helms, Henkin, & Murray, 2005; Salamon, 2012), it is typically not feasible outside of the laboratory since a certain minimum level of flexibility over donor funds is needed for an NGO/charity to be able to operate efficiently. In our theoretical model, we show that provided the intermediary receives sufficient contributions from donors, a slightly lower 80% destination rule would still prevent the intermediary from expropriating the donors' contributions for herself if her doing so meant no public good was successfully funded. This lower 80% restriction would thus give intermediaries some discretion over donors' contributions while leaving unchanged their incentive to fund the public goods compared to the unrealistic 100% destination rule. In our experiment, we first compare the 80% destination rule treatment in which the intermediaries have a low level of discretion over donors' funds to a baseline in which the intermediary has full discretion over contributions received from the donors (i.e. a 0% destination rule). While the latter replicates

[2]In the US, for instance, watchdogs agencies like Charity Navigator and Better Business Bureau (BBB) rate charities as being of high quality only if they have overhead ratios of less than 20 and 35% respectively (as retrieved from the websites of CharityNavigator and BBB on 16th March 2021)

[3]To see why the size of the overhead costs may not be indicative of the charity's quality or efficiency, consider the following hypothetical example: suppose there is a charity (Charity A) with a high overhead ratio of say, 50% of the total contributions received from donors) but deploys its funds such that for every $500 deployed in country X, it has the systems in place to feed 200 families below the poverty line for 1 day. Now suppose another charity (Charity B) has a low overhead ratio of 20%, but is less efficient in that for every $800 it spends in Country X, only 180 families below the poverty line can be fed for one day. As a donor, sending $1000 to Charity A would mean just $500 would be deployed in country X but 200 families would be successfully fed. Sending $1000 to Charity B would mean that while $800 dollars are deployed in country X, only 180 families would be successfully fed. In other words, higher overhead costs or overhead ratios should not be taken as an indicator of low quality. A more detailed discussion of the relevant literature around the perception of overheads and their inability to signal charity quality can be found in Section 2.

[4]In the UK, a news report noted that spends on *non-program* costs among the most popular charities in the UK covered a wide range from 12 to 74% of their total income (The.Week, 2019)

the original baseline from CCR, the former represents a *realistic* restriction that a donor might impose wherein the NGO is committed to spending 80%, rather than 100%, of their donations on the intended cause (i.e the public goods).

In addition to the 0% and 80% destination rule treatments, we also run another treatment in which the intermediary is bound to send just 20% of donations received from donors to the public goods (i.e. a 20% destination rule treatment). In our setting, as would be the case outside the laboratory as well, this restriction on the intermediary would be too low for donors to consider sending their contributions to the intermediary. Nevertheless, this theoretically too low 20% restriction allows us to investigate whether the destination rule has "expressive power". Indeed, previous work has found that in contexts such as ours that are characterized by multiple equilibria, such expressive obligations can enhance coordination by introducing focal points and "rules of conduct" (Cooter, 1998; McAdams, 2000). The 20% destination rule allows us to test whether the very presence of a destination rule has a positive effect on both the willingness of intermediaries to send the donor's contributions to the public goods (i.e. over and above their 20% obligation) as well as the willingness of donors to coordinate their contributions using the intermediary.

A systematic investigation of the interaction between funding restrictions and overhead costs is also important because outside of the laboratory, it is often stringent funding restrictions that are the *cause* for high overhead costs.[5] When it comes to donors' perceptions of NGOs as trustworthy, the positive effects of permitting funding restrictions may thus be undermined by donors' knowledge of the size of the overhead costs these NGOs incur.

Our results from the experiment shed light on the efficacy of different levels of funding restrictions on the intermediary and their interplay with sunk overhead costs incurred by the intermediary: First, we find very limited *expressive* power of the restrictions on the intermediary. In fact, we detect no difference in contributions and profits between the treatments in which the intermediary is committed to contribute only 20% of the money received from the group and the baseline in which there are no restrictions on the transfers received from the group. In line with the theoretical predictions, however, setting the restriction at 80% stimulates transfers to the intermediary and substantially increases overall contributions, coordination and social welfare.

More importantly, we document a strong interaction between the overhead costs and the efficacy of the restrictions placed on the intermediary. We find that when the overhead costs are introduced, the benefits of having the stronger restriction vanishes: In particular, we find that when there is an 80%

[5]Restricted funds require closer tracking and more complicated accounting practices: The 2018 FASB Accounting Standards describes how to deal with donor-restricted net assets. An overview by the National Council for Non Profits of the parts of the standards that summarize this aspect can be found at https://bit.ly/3tl2RFS. Funding Restrictions also prevent NGOs from deploying donations in the most efficient manner: An article in the Stanford Social Innovation Review argues that unrestricted funding is what "makes an organization work smoothly, enables innovation, and provides fuel for growth" besides "[allowing] organizations to weather crises without losing momentum" (Starr, 2011). Another report states that restricted funds have become a destructive force for the sector, wasting time, preventing innovation and hampering the non-profit's ability to adapt (Le, 2016). Supporting this view, several online resources for NGOs were found to detail ways in which they can go about raising entirely unrestricted funds (Brooks, 2019, 2020; USAID, 2020).

restriction on the intermediary, introducing a sunk overhead cost for the intermediary substantially reduces donors' likelihood to send their contributions to the intermediary, which in turn reduces the probability of the group successful coordinating their contributions over the multiple public good.

To understand whether this was driven by the non-negligible size of the overhead costs in the cost treatment, we ran an additional treatment with an 80% restriction on the intermediary but this time reducing considerably the size of the possible overhead costs that could be imposed on the intermediary. We find that the negative impact on delegation and coordination persists even when these costs are negligible. This confirms that it is not the size of these costs but just their presence that reduces the effectiveness of the 80% restriction. Using additional robustness checks, we also show that the overhead costs continue to have a significant negative impact even when the intermediary has *no* discretion over donors' funds i.e. when the intermediary is restricted by a 100% destination rule. This suggests that it is not the uncertainty created by the 80% destination rule which causes the negative response to the overhead costs. Instead, an analysis of donor's willingness to delegate their contributions to the intermediary and the coordination achieved by the groups in the very first round of the experiment suggests that the unwillingness of donors to make use of the intermediary in the presence of overhead costs could be a direct consequence of the ex-ante inequality created between the donors and the intermediary, which reduces the trustworthiness of the intermediary in the donors' eyes.

The rest of the paper is organized as follows. Section 2 provides a review of the relevant literature on delegation and overhead aversion in the context of charitable donations. Section 3 details our experimental design and procedures. In Section 4, we develop our theoretical predictions and the main hypotheses. Section 5 presents and discusses our results, and Section 6 concludes.

2 Related literature

Charitable donations are often modeled in the laboratory using a threshold public good game (List & Lucking-Reiley, 2002; List & Rondeau, 2003; Rondeau & List, 2008). By allowing subjects to choose from multiple identical goods simultaneously, we endeavour to model an environment in which several similar charities vie for donations. Within this set up, CCV showed that increasing the number of public goods resulted in miscoordination among donors, lower contributions and a lower probability that any public good reached their contribution threshold. Several papers since have looked at extensions of CCV (Ansink, Koetse, Bouma, Hauck, & van Soest, 2017; Bouma, Nguyen, Van Der Heijden, & Dijk, 2020; Cason & Zubrickas, 2019). CCR extended CCV by introducing the possibility of coordinating contributions via an intermediary, and within this setting, consider two extreme cases. In the first, the intermediary has no discretion over the donors' transfers to her and is obliged to send all such transfers to the public goods (i.e. a 100% destination rule). In the second, the intermediary has full discretion over the donors' transfers and is not obliged to send any of their transfers to the public goods (i.e.

a 0% destination rule). CCR show that relative to a baseline with no intermediary, an increase in the likelihood that the public good is successfully funded is only achieved if the intermediary is restricted by a 100% destination rule.

However, neither the 100% nor the 0% destination rule captures the true dilemma faced by donors when faced with the choice of contributing via an intermediary. This is because while donors can typically be certain that reputed intermediaries will send most of their transfers to the public goods, there is always the possibility that a *part* of their contributions are employed for a different purpose which is at the discretion of the intermediary. Existing work has shown that this uncertainty about how their contributions will be utilized plays a crucial role in shaping donors' contribution behavior. Small and Loewenstein (2003) and Fong and Oberholzer-Gee (2011) document reduced giving in response to uncertainty about the recipient of the donation. In laboratory experiments, Exley (2016) and Garcia, Massoni, and Villeval (2020) show that subjects use the uncertainty that their contribution will have less than the desired impact as an excuse to refrain from giving altogether. In line with this result, several studies show that contributions increase if donors perceive a greater sense of control over how their contributions are spent (Batista, Silverman, & Yang, 2015; Eckel, Herberich, & Meer, 2017; Kessler, Milkman, & Zhang, 2019; S.X. Li, Eckel, Grossman, & Larson, 2013).

In this paper, we focus on situations where a *part* of donors' contributions are at the discretion of the intermediary. Donating through an intermediary may thus involve some degree of uncertainty because of intermediaries may use this discretion to their advantage and expropriate donated funds for themselves and donors', for their part, are unable to track their donation to its end beneficiary. Chlaß, Gangadharan, and Jones (2015) study how subjects react to the presence of an intermediary (played by another subject in the experiment) who can expropriate for herself any amount of a donor's contribution directed toward helping a disadvantaged recipient. They find that most donors tend to be 'price-oriented', reducing the size of their donation in response to expected embezzlement by the intermediary, and 'donation-oriented', donating the same amount with and without intermediaries, rather than 'outcome oriented', donating a higher amount to *compensate* for expected embezzlement by the intermediary. Using a three player embezzlement game in the lab, Attanasi, Rimbaud, and Villeval (2019) find that even after controlling for beliefs about the level of expropriation by the intermediary, donors are more likely to give when intermediaries have the opportunity to expropriate a lower rather than higher proportion of their transfers to recipients. Di Falco, Magdalou, Masclet, Villeval, and Willinger (2017) find that senders are more generous when there are fewer intermediaries between them and the recipient. Since these papers usually employ a version of the serial dictator game, the intermediary in these studies serves no useful function, representing just an extra step between donor and recipient. This is in contrast to the threshold multiple public-good set up in our experiment in which intermediaries serve the useful function of coordination donors' contributions. Butera and Houser (2018) find that when the presence of an intermediary can increase the effectiveness (or benefit) of donors' contributions, there is no drop in contributions relative to the treatment without an intermediary. It is as yet unclear the extent to which donors might trust their contributions to an intermediary who, despite serving the valuable function of coordinating their contributions, also has the opportunity to expropriate those contributions for herself.

In this paper, we look not only at a strong and theoretically effective 80% restriction on the intermediary that nonetheless still leaves room for expropriation, but also at a weak and theoretically ineffective 20% restriction. The reason for including the 20% restriction treatment stems from the behavioral and experimental evidence documenting the effects of the expressive function of laws. According to this strand of literature, a rule can have 'expressive power', beyond the incentives that back it. Experimental studies have shown that formal obligations may exert an expressive effects on agents' behaviors that are independent of the system of material incentives they entail (Bowles, 1998; Cooter, 1998, 2000; Kahan, 1998; Kreps, 1997). Demonstrating this, Galbiati and Vertova (2008) conduct a laboratory experiment in which they vary the level of a minimum contribution obligation to a public good, keeping fixed across treatments the (non-deterring) incentives of complying with this minimum contribution level. They find across treatments that higher levels of the minimal contributions significantly increase average contributions indicating that it is the obligation per se that had a positive effect on contributions. Galbiati and Vertova (2014) further show that the channel through which the obligation (with non-deterring incentives) works is by affecting people's beliefs about others' contributions. Barron and Nurminen (2020) present suggestive evidence to show that this effect is driven by the presence of a focal point that helps conditional cooperators coordinate their contributions. Thus, the theoretically irrelevant 20% rule could shift the intermediary's preferences by expressing a social norm that if internalized would provide an opportunity for a "Pareto self-improvement" in which the intermediary might be willing to contribute more than the required minimum to the public goods. Anticipating this, donors might be more willing to transfer their contributions to the intermediary compared to the treatment in which no rule, expressive or otherwise, restricts the intermediary.

Besides studying the effects of more realistic levels of restrictions on the intermediary, the most important contribution of our experiment is exploring the effect of sunk costs incurred by the intermediary under these different restrictions. Since the cost is sunk by definition at the time of fundraising, it should not affect donors' decisions al all. And yet, a negative response to these costs would be in line with the well documented phenomenon of 'overhead-aversion'. This is the phenomenon whereby donors make assumptions about the efficiency of the intermediaries based on the size of their overhead costs. Despite evidence that suggests overhead ratios are largely uninformative about a charity's *effectiveness* (Steinberg, 1986) and that the pressure to keep them low may even cause harmful side effects (Steinberg & Morris, 2010), donors still appear to perceive them as an indicator of the charity's quality (Bennett & Savani, 2003), heavily penalizing high overhead ratios (Caviola, Faulmüller, Everett, Savulescu, & Kahane, 2014; Charles, Sloan, & Schubert, 2020; Gneezy, Keenan, & Gneezy, 2014; Portillo & Stinn, 2018) and doing so even when the overhead cost represents an unavoidable consequence of operating in a given sector (Samahita & Lades, 2021).

Our modeling of the overhead as a sunk cost captures the theoretically irrelevant nature of these costs that could nonetheless exert a psychological effect on donors' perception of the intermediary's *trustworthiness* and subsequently reduce their willingness to transfer their resources to an intermediary who incurs these overhead costs. Another possibility is that the presence of overhead costs simply diverts the donors' attention from the dilemma at hand, preventing them from correctly assessing the intermediary's incentives and seeing the overhead costs for what they are. Consistent with this reasoning, Coffman (2017) find that when donors receive irrelevant information in the process of deciding how much to donate to a charity, namely that there will be an intermediary who collects their donations, it prevents them from taking into account information that they would have otherwise used to assess the charity's quality.

3 Experimental design

In our experiment, all participants engaged in 12 rounds of the threshold multiple public goods game in groups of 4 that remained the same throughout the experiment. At the beginning of *each* round, an intermediary was randomly selected from among the 4 members of the group. Our conceptualization of the intermediary is that of another donor who simply has the added function of coordinating the group's contributions should they choose direct them through her. In the first phase of each round, we thus give donors the opportunity to coordinate their contributions via another donor in their group (i.e. the intermediary) while in the second phase, all donors (including the intermediary) face the same contribution choice with their updated endowments (i.e. after accounting for the transfers to the intermediary in the first stage).

We thus allow donors to either contribute via an intermediary, in which case they face the risk that their contribution will be expropriated, or contribute directly to the public goods, in which case they face the risk that their contributions will be wasted on projects that do not reach their funding thresholds.

We implement 6 treatments using a 3x2 between subjects design in which we vary the size of the restriction on the intermediary or the "destination rule" (0, 20 or 80%) and the presence or absence of overhead costs incurred by the intermediary regardless of whether or not any public good was successfully funded.

Before we describe the different stages of the experiment in detail, we note a few points about our overall design choices. Firstly, while groups remained the same throughout the experiment, the role of the intermediary was not fixed. Had we fixed the role of the intermediary for all rounds, it would have been in the interest of the intermediary to build up a reputation for not expropriating transfers sent to her by the group, at least in the initial rounds. Randomizing the role of the intermediary prevented such reputation building concerns as well as individual specific behavior of the intermediary from confounding our results. Secondly, every round was paid. This allowed us to ensure that social preferences (such as inequity aversion) could not drive donors' choice of transfer to the intermediary in the cost treatments since all subjects experienced the same costs (and/or benefits) of being the intermediary in expectation across all rounds. Thirdly, our choice of the specific incentives, number of public goods and feedback provided to subjects follows the experimental design of CCR.

This allows us to replicate key results and build on them. Detailed instructions as well as screenshots of the different phases of each round and the feedback received by subjects at the end of each round can be found in Appendix B.

At the beginning of each round, participants received an initial endowment of 55 tokens. Each round consisted of two phases: a delegation phase and a contribution phase. At the beginning of the delegation phase in all treatments, the computer randomly chose one of the group members to serve as an intermediary, and subjects were privately informed about their role (i.e. intermediary or not). They were also told about the percentage of their transfers the intermediary was required to send to the collective accounts (this percentage depended on the treatment to which they had been assigned). During the delegation phase, the donors *not* assigned to the role of intermediary simultaneously decided how much of their initial endowment (between 0 and 55) to send to the intermediary. The intermediary made no choice during this phase. All subjects then moved on to the contribution phase.

At the beginning of the contribution phase, subjects were once again reminded of the destination rule. They were also given the information about the overall amount transferred to the intermediary, and their own updated endowment. For the donors not in the role of intermediary, their updated endowment equaled 55 minus any transfer they had made to the intermediary in the delegation phase. For the intermediary, this equaled 55 plus the sum of transfers from the other three members of her group. In the contribution phase, all subjects decided how to allocate their updated endowment of tokens between their private account and 12 collective accounts (i.e. the public goods). The private account generated a return of 2 points for every token allocated to it. In the case of the collective accounts, the return depended on whether or not the contribution threshold (of 132 tokens) was reached. When total contributions to a given collective account fell below the threshold (τ) of 132 tokens, the contributions to that collective account were forfeited. When contributions to a given collective account reached or exceeded the threshold, all players benefited equally. The benefit associated with a given collective account depended on total contributions to that account from all players, denoted by C_n, and is given (in points) by:

$$B_n(C_n) = \begin{cases} 0 & \text{when} \quad C_n < \tau \\ C_n + b_n & \text{when} \quad C_n \geq \tau \end{cases}$$

where b_n is either 20 or 30 points and denotes the bonus associated with that collective account. Four of the twelve collective accounts offered bonuses $b_n = 30$ points, and the remaining eight offered bonuses $b_n = 20$ points. The threshold τ for each of the 12 collective accounts was set at exactly 60% of the total initial endowment of all members of the group at the beginning of each round thus ensuring that at most one public good could be effectively funded in any given round.

Each subject was presented with 13 boxes (on their screen).[6] Each of the 12 boxes of the collective accounts showed the threshold (132 tokens) and the size

[6] Just as in CCR, in order to minimize frame effects associated with letter or number labels, the twelve collective accounts were labeled using colors: white, yellow, green, red, violet, blue, gray, gray, purple, brown, pink, black and orange.

of the corresponding bonus associated with that collective account. Following CCR, the four collective accounts with a bonus of 30 points were randomly selected in rounds 1, 5, and 9, and were kept unchanged for four consecutive rounds.

At the end of every round, each subject was informed about the number of tokens allocated by the group to each collective account and whether the corresponding threshold was reached. Additionally, subjects learned the number of points they received from each collective account (including any bonus) and in total for that round.

Provided the donors transferred sufficient tokens to the intermediary in the delegation phase, the intermediary could potentially single-handedly direct enough tokens to a one collective account in the contribution phase so as to reach the contribution threshold of 132 tokens, thus overcoming the coordination problem.

As mentioned in the beginning of this section, we employed a 3x2 between-subjects design in which we varied the size of the destination rule (0%, 20% or 80%) and the presence of an overhead sunk cost that would be incurred by the intermediary, thus creating 6 experimental treatments in total: $NoRule_{NoCost}$ and $NoRule_{Cost}$; $20Rule_{NoCost}$ and $20Rule_{Cost}$; and $80Rule_{NoCost}$ and $80Rule_{Cost}$.

(a) *The Destination Rule*: This parameter reflects the percentage of transfers received from the donors that the intermediary is required to allocate to the collective accounts. In our experiment, the size of the destination rule was either 0%, 20% or 80%. In the case of the 20% (80%) destination rule, the intermediary is required to allocate at least 20% (80%) of the transfers received from the donors to the collective accounts in the contribution phase. In the absence of a destination rule (i.e. the 0% destination rule), the intermediary is free to allocate any amount of the transfers received from the donors to her private account in the contribution phase. The manipulation of the size of the destination rule gives us three treatments, namely the $NoRule_{NoCost}$, $20Rule_{NoCost}$ and $80Rule_{NoCost}$ treatments.

(b) *Intermediary Overhead Sunk Costs*: These costs are incurred solely by the intermediary. These costs were imposed in each of three destination rule treatments described above to give us three *Cost* treatments namely $NoRule_{Cost}$, $20Rule_{Cost}$ and $80Rule_{Cost}$. Within the cost treatments, the costs that would be incurred by the intermediary were selected randomly by the computer and could take one of three values: 20, 35 or 50 points, each with equal likelihood. In all cost treatments, the size of these randomly chosen intermediary costs were revealed to all members of the group at the beginning of the delegation phase in each round. They were also reminded of it at the beginning of the contribution phase in each round. Participants in the cost treatments were aware that the intermediary costs for that round would be subtracted from the intermediary's round earnings at the end of the round regardless of whether or not any of the 12 public goods were successfully funded.

3.1 Experimental Procedures

The experiment was conducted in November and December 2020 with participants who had signed up for economic experiments at the Masaryk University Experimental Economics Laboratory (MUEEL) in Brno, Czech Republic. The subject pool consisted mainly of undergraduate and master students at Masaryk University. They were recruited using hroot (Bock, Baetge, & Nicklisch, 2014). The experiment was programmed in zTree (Fischbacher, 2007) and due to the COVID-19 pandemic was implemented online in a "lab-on-the-web" environment (Buso et al., 2021; J. Li, Leider, Beil, & Duenyas, 2021) using z-Tree Unleashed (Duch, Grossmann, & Lauer, 2020). Since no participant was physically present in the laboratory during the experiment, we asked each of them to briefly turn on their video while checking them in to a virtual Zoom room to ensure they were in a quiet location without outside distractions. The initial instructions for the experiment were delivered over Zoom. One of the experimenters read out the instructions and participants were able to follow along on their screens (see Appendix B). After the instructions were delivered, participants completed a series of comprehension questions to check their understanding of the type of interaction they would be engaging in and the incentives involved. They then engaged in 12 rounds of the threshold multiple public goods game with delegation. This was followed by a short post-experimental questionnaire. Each session lasted approximately 90 minutes and the mean payoff was CZK 281 (approx. 11 EUR)[7]. During the comprehension questions as well as during the threshold multiple public goods game, participants were allowed to communicate with the experimenters via the private chat feature on Zoom but could not see or communicate with one another. We collected data from a total of 320 participants across 18 sessions (3 sessions per treatment) with either 16 or 20 participants per session.

4 Theoretical setting

There are J players, indexed $j \in \{1, \ldots, J\}$. Each player receives an endowment y at the beginning of the game. In the first stage of the game, player i is appointed to serve as the intermediary, and then the other players (or *donors*) choose how much of their endowments to transfer to player i. We denote player j's transfer to the intermediary by $d_j \in [0, y]$, and let $D = \sum_{j \neq i} d_j$. In the second stage, all four players simultaneously choose how to distribute their endowments across the N public goods and their private account, except now their endowments are updated to reflect the first stage transfers. These updated endowments are referred to as players' *effective endowments*. The contribution of each player to good n is denoted by $c_{j,n} \geq 0$. Let $C_n = \sum_j c_{j,n}$ and $c_j = \sum_{n=1}^{N} c_{j,n}$ denote the aggregate contributions to good n and the total contributions made by each player respectively. A player's total donations cannot exceed her endowment: $c_j \in [0, y]$. The function $B_n(C_n) = B(C_n)$ determines the benefit each player receives from public good n. The benefit depends on whether total contributions to a given public good n reach a certain contribution threshold τ. Below this threshold, the public good fails to return any

[7] In terms of purchasing power parity or PPP, 1 EUR in the Czech Republic is equivalent to 1.45 EUR in Germany, as a reference Euro country and so the average payment was around 16 EUR.

benefit, and any contributions made to it are lost (i.e. we implement a "no-money-back" condition in case the threshold is not reached). Thus, for each good n,

$$B_n(C_n) = \begin{cases} 0 & \text{when} \quad C_n < \tau \\ C_n + b_n & \text{when} \quad C_n \geq \tau \end{cases}$$

When the threshold τ is reached, the public good returns a benefit to each player that is increasing in total contributions, plus a bonus of b_n associated with good n. Any unit of endowment not contributed to a public good gets directed to private consumption, where it returns a marginal benefit of 2 (implying the marginal per capita return to the public good is 1/2 that from private consumption). Therefore, the total payoff of player j (non-intermediary) is:

$$u_j(c) = 2(y - d_j - \sum_{n=1}^{N} c_{j,n}) + \sum_{n=1}^{N} B(C_n)$$

and the total payoff of player i (the intermediary) is:

$$u_i(c) = 2(y + D - \sum_{n=1}^{N} c_{i,n}) + \sum_{n=1}^{N} B(C_n)$$

As per the parameters in the experiment, $J = 4$, $N = 4$, $y = 55$, $\tau = 132$ and $b_n \in \{20, 30\}$. There are a total of 12 public goods in the experimental setting. However, since only 4 of these 12 have the higher bonus of 30 points associated with it in any given round, we assume, that players limit attention to these goods. The chosen parameters ensure that groups can fund at most one public good at its threshold, that players are unable to unilaterally fund a good at its threshold, and that they prefer to contribute to a public good only if they expect that others are also contributing to the same public good. The threshold public goods game is therefore a coordination game in which players need to find a way to send their contributions to the same good in order to reap the benefits of contributing at all.

We consider three versions of the game with delegation. In $NoRule_{NoCost}$, the intermediary faces no restrictions on the allocation of transfers received from the donors in the first stage. In $20Rule_{NoCost}$, the intermediary faces a destination rule requiring that at least 20% of total transfers received from the donors is allocated to a public good. In $80Rule_{NoCost}$, this restriction is increased to 80%, meaning that 80% of the total transfers that the intermediary receives from the donors has to be directed to a public good. For each of the above three versions, we also have a corresponding cost treatment, namely $NoRule_{Cost}$, $20Rule_{Cost}$ and the $80Rule_{Cost}$, in which we introduce a cost in points that is incurred by the intermediary. This cost is randomly selected from among three values and incurred by the intermediary regardless of whether or not any public good is successfully funded.

4.1 Destination rules and overhead costs: testable predictions.

In deriving the testable predictions, we focus on the one-shot version of threshold multiple public good game with delegation. We will use the following two statements as starting points for our theoretical analysis: (i) no equilibria exist in which any public good is funded above its threshold;[8] (ii) no equilibria exist in which any public good receives positive contributions below its threshold.[9]

A detailed theoretical analysis of the situation in which the intermediary faces no restrictions on donor transfers has been provided in Appendix A of CCR. This analysis shows that, in the absence of any restrictions on the funds received from donors in the first stage, the intermediary should expropriate all donor transfers for herself rather than allocate them to the public good. Donors are therefore better off contributing directly to one of the four public goods in the second stage. As a result, the coordination problem is not effectively mitigated in the *NoRule* treatments where the intermediary has full discretion over the use of donor transfers.

In this set-up, our experiment introduces two main innovations, the first being the overhead cost and the second being a realistic destination rule. For expositional reasons, we discuss the effect of different destination rules first because these generate different predictions while the introduction of overhead costs does not.

To understand the impact of the 20% and 80% destination rules, let us assume that a restriction r (where $r = 20$ or 80) is imposed on the transfers to the intermediary, that prevents the intermediary from expropriating more than r% of the total funds transferred to her by the donors in her group. We further assume that, in order to solve the coordination problem, donors transfer sufficient funds to the intermediary so as to ensure that the effective endowment of the intermediary equals or exceeds the threshold τ.[10] In this situation, there are two possibilities. The intermediary can either choose to fund one of the public goods at its threshold, or she could choose to direct the maximum proportion of donor transfers (i.e. $(1 - r/100)D$) as well as her own initial endowment y to her private account. If the intermediary were to do the former, she would earn a total of:[11]

$$\pi_i = (\tau + b_n) + 2(y + D - \tau) \tag{1}$$

[8]Given the parameters in our experiment, the marginal benefit of contributing to one's private account exceeds that of contributing to a public good beyond its threshold.

[9]As a result of the "no-money-back" condition, any player that contributes to an underfunded good would have an incentive to deviate and instead direct their contributions to their private account (or potentially increase their contribution to the public good such that total contributions reach the threshold).

[10]This means that the total transfers D should be equal to the threshold τ less the intermediary's initial endowment y. Substituting the values from the parameters in this experiment, $D = 132 - 55 = 77$.

[11]This formulation of the intermediary's earnings from successfully funding a public account only holds if r% of D is less than or equal to the threshold, which is always the case with the parameters in the current experiment.

Alternatively, if the intermediary were to direct the maximum possible amount to her private account, she would earn a total of:

$$\pi_i = 2[y + (1 - r/100)D] \tag{2}$$

In order for the intermediary to be willing to unilaterally fund the public good at its threshold, (1) should be $\geq$ (2). Simplifying, we see that the following condition should hold:

$$r \geq \frac{(\tau - b_n) * 100}{2D} \tag{3}$$

Using the parameters chosen for our experiment and substituting the values of $\tau(= 132)$, $b_n(= 30)$ and $D(= 77)$ in (3), we see that this condition is only true when r is $\geq$ 66.2. This means when $r = 20$, i.e. in *20Rule*$_{NoCost}$, the intermediary always has an incentive to expropriate donor transfers for herself instead of directing it to the public good. Anticipating this, donors should prefer not to make *any* transfers to the intermediary and instead attempt to directly coordinate their contributions on one of the public goods in the contribution phase. The coordination problem thus persists under the 20% destination rule and we should see no difference between the *20Rule*$_{NoCost}$ treatment and the *NoRule*$_{NoCost}$ treatment.

On the other hand, under the same assumptions, when $r = 80$, i.e. in *80Rule*$_{NoCost}$, the intermediary is always better off funding the public good. Accordingly, there is no threat of expropriation by the intermediary, donors can contribute via the intermediary without fearing expropriation and the coordination problem is effectively mitigated.

In three treatments, *80Rule*$_{Cost}$, *20Rule*$_{Cost}$,s *NoRule*$_{Cost}$ treatments, the intermediary incurs a random overhead cost regardless of (i) the overall amount contributed to the public goods, and (ii) whether or not her group reaches the threshold for any given public good. Given its sunk nature, the intermediary costs do not alter the theoretical considerations on coordination, cooperation, or the intermediary's behavior discussed above.

We note that in the repeated version of the game, players may use conditional strategies to reduce the threat of expropriation by the intermediary even in the absence of a high destination rule. Using such strategies, donors could potentially contribute only via the intermediary, except in the last round when they would not need the intermediary to coordinate if they just continue to fund the same good that was funded in the previous round. Thus even when there is a very low or even non-existent destination rule, the repeated environment could allow for contribution via the intermediary, and thus reduce the risk of miscoordinating. However, this requires much more complex conditional strategies than if there were a very high destination rule (i.e. 67% or higher) and we therefore do not consider that they would be used in the current set up.

4.2 Hypotheses

Based on the previous discussion, we formulate the following hypotheses:

Hypothesis 1 The effect of the size of the destination rule: Relative to the baseline where there are no restrictions on the intermediary's allocation decisions in the contribution phase:

(a) Transfers to the intermediary, contributions to the public goods, coordination over the public goods and overall profits are unaffected by the introduction of a 20% destination rule;

(b) Imposing an 80% destination rule increases transfers to the intermediary, contributions to the public goods, coordination over public goods and overall profits.

Part (a) of the previous hypothesis allows us to assess the potential "expressive" power of the destination rule by comparing coordination, cooperation, and transfers to the intermediary between $NoRule_{NoCost}$ and $20Rule_{NoCost}$. Indeed, the existence of a mild and theoretically irrelevant destination rule can represent a powerful contribution norm for the intermediaries and sustain the common belief that they *ought* to always send what was transferred to them by the other group members to the public goods.

Hypothesis 2 The effect of the overhead costs: For a given size of the destination rule, introducing an overhead sunk cost on the intermediary does not affect transfers by the group to the intermediary, contributions to the public goods, coordination over public goods or profits.

Despite this prediction, the empirical results on overhead aversion and the sunk cost bias would suggest that overhead costs could cause donors to respond in a negative way. This would then reduce the transfers made by donors to the intermediary and result in lower coordination over the public goods.

5 Results

The statistical analysis is developed following the order of our hypotheses presented in Section 4.2. We first check for aggregate differences in treatments manipulating the size of the destination rule (Hypothesis 1). To do so, we combine the *Cost* and the *NoCost* treatments under each destination rule, thus creating the larger *NoRule*, *20Rule* and *80Rule* treatments. Next, we separately examine the three treatments that do not impose any costs on the intermediary (i.e. $NoRule_{NoCost}$, $20Rule_{NoCost}$ and $80Rule_{NoCost}$) followed by an analysis of the three treatments that do impose an overhead costs on the intermediary (i.e. $NoRule_{Cost}$, $20Rule_{Cost}$ and $80Rule_{Cost}$). This enables us to test whether there is a change in subjects' behavior in response to the overhead costs (Hypothesis 2).

We rely on both parametric and non-parametric techniques: For the parametric analysis, we use panel two-way mixed models with random effects and standard errors clustered both at individual and group level to account for potential individual dependencies over rounds as well as intra-group correlations. The non-parametric tests are based on independent observations at the group level. All non-parametric results are based on two-sided tests with p-values corrected for multiple hypothesis testing by adjusting the rejection cut-off criteria (Holm, 1979; van der Laan, Dudoit, & Pollard, 2003).

5.1 Descriptives

We first summarize the individual characteristics of the subjects who participated in our experiment (Table 1) and then present descriptive statistics for our main outcome variables by treatment (Table 2).

Table 1 shows that subjects' level of risk aversion (Dohmen et al., 2011), the proportion of males, and the proportion enrolled in Economics/Business majors are balanced across our treatments: the null hypotheses of joint equality of the means are never rejected at any conventional statistical level.

Figure 1 displays for each treatment the size of average transfers to the intermediary in Stage 1, the intermediary's contributions and the groups' overall contributions to the public goods in Stage 2. A visual inspection suggests that transfers to the intermediary are higher in $80\text{Rule}_{\text{NoCost}}$ than in $80\text{Rule}_{\text{Cost}}$. Moreover, in the $80\text{Rule}_{\text{NoCost}}$ treatment alone, we observe that the amount contributed by *non*-intermediary members to the public goods (i.e. the difference between the overall contributions and the intermediary's contribution) is negligible. This suggests that unlike in the other treatments, subjects in the $80\text{Rule}_{\text{NoCost}}$ treatment take full advantage of the intermediary to solve the coordination problem associated with multiple public goods funding dilemma.

Table 1 Treatments: summary table.

Condition	Subjects	Groups	Obs.	Male	Econ.	Risk Av.
$NoRule_{NoCost}$	52	13	624	0.48	0.53	6.13
$20Rule_{NoCost}$	52	13	624	0.40	0.48	5.60
$80Rule_{NoCost}$	60	15	720	0.52	0.58	5.73
$NoRule_{Cost}$	52	13	624	0.38	0.37	5.94
$20Rule_{Cost}$	52	13	624	0.46	0.48	5.21
$80Rule_{Cost}$	52	13	624	0.54	0.42	5.87
Total/Mean	320	80	3840	0.47	0.47	5.75
Joint equality (p-value)				0.557	0.247	0.347

Notes: *Male* is the proportion of males; *Econ.* is the proportion of economics students; *Risk Av.* spans from 0: 'not willing at all to take risks' to 10: 'very willing to take risks' (Dohmen et al., 2011).

In Table 2, we summarize our main outcome variables by treatment in the first round (*t=1*) and then aggregated across all rounds (*All*). These outcomes are (i) the amount transferred by donors to the intermediary, (ii) the overall contributions of the group to the public goods, (iii) the proportion of groups successfully coordinating (reaching the threshold) on a public good, and (iv) the level of individual profits.

The remainder of the results section investigates the effects of the experimental treatments on these key outcomes.

5.2 The effects of the different destination rules

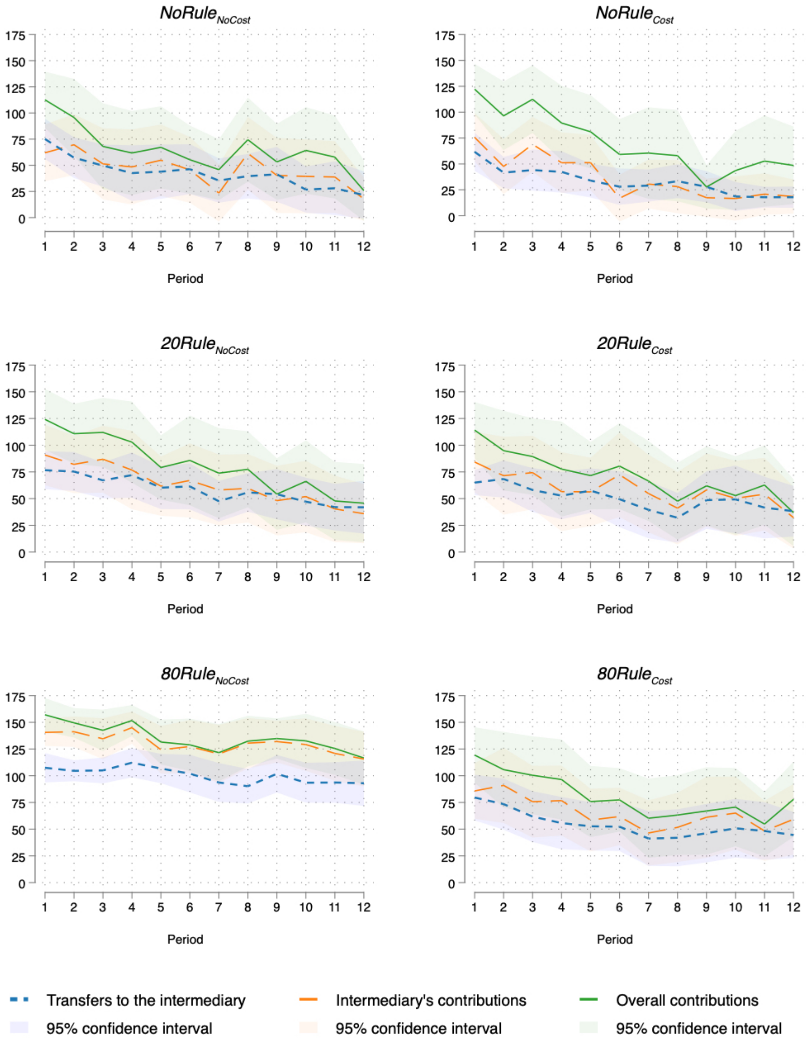
Figure 2 displays the means of the key outcome variables across rounds under the different destination rules pooling observations from the *Cost* and *NoCost*

Table 2 Transfers to the intermediary, overall contributions, proportion of contributions by the intermediary, coordination, and profits: descriptive statistics, by treatment.

	Transf. Del (*t=1*)	Transf. Del (*All*)	Cont (*t=1*)	Cont (*All*)	Cont Del (*t=1*)	Cont Del (*All*)	Profit (*t=1*)	Profit (*All*)	Coord (*t=1*)	Coord (*All*)
$NoRule_{NoCost}$	25.051	14.103	28.154	16.295	0.467	0.568	78.462	116.949	0.154	0.218
	(18.517)	(18.560)	(33.887)	(35.634)	(0.370)	(0.393)	(87.659)	(69.309)	(0.364)	(0.413)
$20Rule_{NoCost}$	25.538	19.485	31.058	20.421	0.692	0.754	91.346	125.420	0.231	0.308
	(15.864)	(17.799)	(44.408)	(39.192)	(0.234)	(0.263)	(85.692)	(75.500)	(0.425)	(0.462)
$80Rule_{NoCost}$	35.822	33.441	39.267	33.853	0.903	0.958	183.800	184.350	0.867	0.806
	(15.968)	(16.153)	(60.789)	(59.720)	(0.081)	(0.083)	(62.344)	(64.610)	(0.343)	(0.396)
$NoRule_{Cost}$	20.564	11.004	30.558	17.752	0.600	0.409	76.500	106.971	0.154	0.167
	(17.687)	(15.944)	(36.841)	(29.641)	(0.289)	(0.345)	(74.773)	(71.069)	(0.364)	(0.373)
$20Rule_{Cost}$	21.667	16.682	28.538	17.846	0.713	0.778	131.538	130.833	0.462	0.327
	(16.573)	(19.415)	(42.774)	(40.164)	(0.287)	(0.329)	(83.153)	(69.132)	(0.503)	(0.469)
$80Rule_{Cost}$	26.538	18.017	29.846	20.189	0.663	0.784	107.846	120.897	0.308	0.282
	(17.443)	(19.670)	(41.858)	(39.933)	(0.249)	(0.240)	(80.329)	(68.487)	(0.466)	(0.450)
Obs.	240	2880	320	3840	80	782	320	3840	320	3840

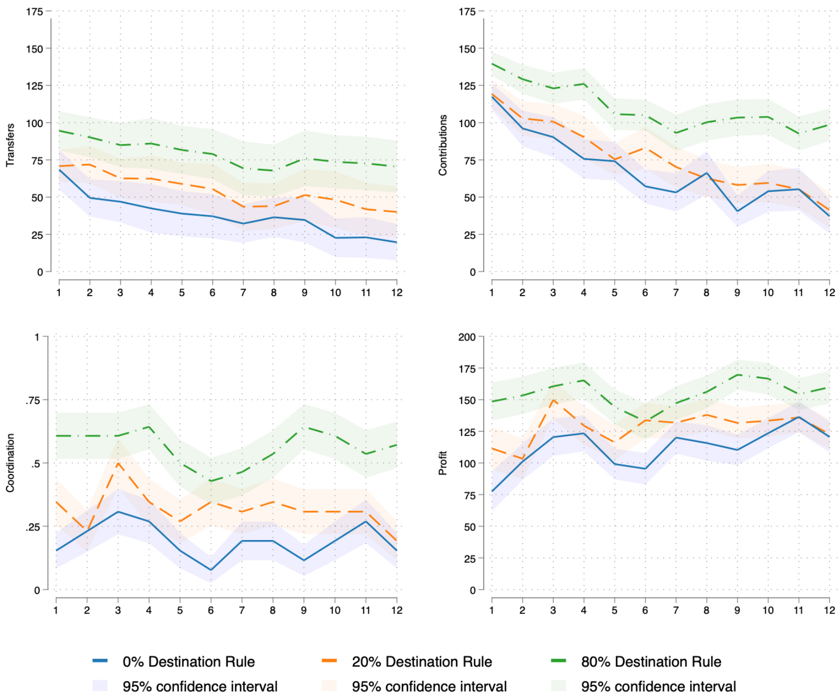
Notes: This table reports average values of the four key outcome variables – amounts transferred to the intermediary (Transf. Del), overall contributions to the public goods (Cont), proportion of contributions by the intermediary on overall contributions to the public goods (Cont Del), final profits (Profit) and proportion of groups who successfully coordinated reaching the threshold (Coord) – in the first round (*t=1*) and then aggregated across all rounds (*All*). Standard deviations are reported in parentheses.

Fig. 1 Transfers to the intermediary and composition of the contributions



treatments. Visual inspection suggests that donor transfers to the intermediary across rounds are higher on average in the *80Rule* treatments compared to both the *NoRule* and *20Rule* treatments. A similar pattern is seen for the other three outcome variables with the *80Rule* treatment also resulting in higher overall contributions by the group to the public goods, a greater proportion of successful coordination (threshold reached) on one of the public goods and higher individual profits.

Fig. 2 Transfers to the intermediary, overall contributions, coordination, and profits, by destination rule and round.



To check the statistical validity of these observations, Table 3 investigates the effects of the different levels of the destination rules: we regress each outcome variable on treatment dummies for the *20Rule* and *80Rule* treatments, with the constant representing the baseline *NoRule* treatments.[12] Model (1), in which the outcome variable is the group's total transfers to the intermediary, validates the observations from Figure 2. In other words, while we find that the *20Rule* treatments are statistically indistinguishable from the *NoRule* treatments, there is a significant ($p < 0.001$) increase in transfers (approximately, +11 tokens) in the *80Rule* treatments relative to the baseline *NoRule* treatments. This result is confirmed using non-parametric tests as well (MWU-test $p < 0.010$).

For the three remaining outcome variables, we document a remarkably consistent pattern, qualitatively similar to the one observed for the first outcome variable. The *80Rule* treatments result in significantly higher (i) overall contributions to the public goods – models (3) and (4), (ii) overall profits – models (5) and (6), and (iii) proportion of groups successfully coordinating (threshold reached) on a single public good – models (7) and (8). Models

[12] For the last two models in Table 3 in which the outcome variable represents whether or not the group successfully coordinated reaching the threshold on one of the public goods, we report marginal effects from Probit models (standard errors clustered at individual level).

(2), (4), (6) and (8) are used to assess whether our results change when we control for a time trend and the ability of the group to reach the threshold in the previous round. The coefficient of the latter variable, *Coord(t-1)*, is positive and highly significant ($p < 0.001$) in all these models indicating that contributions increase when the group successfully reached the threshold in the previous round. In model (4), where the dependent variable is contributions to the public goods, the *80Rule* treatment dummy decreases both in its magnitude (-50%) and statistical significance ($p = 0.050$) when we control for $Coord_{(t\text{-}1)}$, implying that the increase in individual contributions in the *80Rule* treatments is driven by the group's past success in coordinating their contributions on one of the alternative public goods.

Result 1*: Relative to the NoRule treatments, the 80Rule treatments significantly increase transfers to the intermediary, contributions to the public goods, coordination over public goods and overall profits. The 20Rule treatments are statistically indistinguishable from the NoRule treatments.*

5.3 The effects of the destination rules with no overhead costs

We now separately study the effects of the size of the destination rule when no overhead costs are imposed on the intermediary. As seen from Figure 3, it is clear that in the *absence* of overhead costs (left panel of Figure 3), the same pattern is observed. In Table 4, we now include our entire sample and regress the four key outcome variables on separate treatment dummies for each of our treatments: $20Rule_{NoCost}$, $80Rule_{NoCost}$, $20Rule_{Cost}$, $80Rule_{Cost}$ and $NoRule_{Cost}$, relative to the $NoRule_{NoCost}$ baseline. Focusing only on the first three rows of Table 4, a linear test on the estimated coefficients of the treatment dummies, as well as non-parametric tests, confirm that the difference between $80Rule_{NoCost}$ and $NoRule_{NoCost}$ is positive and highly significant ($p < 0.001$) for each of our outcome variables.

This result is confirmed by non-parametric analysis (pairwise MWU-tests $p < 0.010$). Further, the documented effect of the 80% destination rule is larger in the *absence* of overhead costs. The 20% destination rule has no effect relative to the baseline ($p = 0.141$) in the absence of costs as well. As before, models (2), (4), (6) and (8) reveal that these results are robust to controlling for a time trend as well as successful coordination in the previous round.[13]

5.4 The effect of the overhead costs

We now investigate the effects of the overhead costs on the intermediary. Figure 3 plots the aggregated total transfers to the intermediary across rounds in $NoRule_{Cost}$, $20Rule_{Cost}$ and $80Rule_{Cost}$ in the right panel, with the corresponding plots of the treatments without costs displayed in the left panel. From this figure, it appears that for the *80Rule* destination rule, the overhead costs reduce the amount transferred to the intermediary (MWU-test

[13] In model (2), when controlling for the linear time trend and successful coordination in the previous round, we observe a weakly ($p = 0.094$) positive effect of the $20Rule_{NoCost}$ treatment on transfers to the intermediary. However, this effect is small and is also not consistently observed across the other outcome variables.

Table 3 The effects of the different destination rules: parametric analysis

	(1) Transf. Del	(2) Transf. Del	(3) Cont	(4) Cont	(5) Profit	(6) Profit	(7) Coord	(8) Coord
$20rule_{(Cost\ \&\ NoCost)}$	5.651*	4.939*	2.111	0.017	16.167	12.276	0.149	0.149
	(3.037)	(2.479)	(3.491)	(2.389)	(11.647)	(10.131)	(0.275)	(0.275)
$80rule_{(Cost\ \&\ NoCost)}$	13.627***	11.079***	10.486***	4.752**	42.930***	34.115***	0.383***	0.383***
	(2.982)	(2.449)	(3.428)	(2.422)	(11.437)	(10.006)	(0.279)	(0.012)
Trend		-0.818***		-1.099***		1.200***		-0.005
		(0.074)		(0.213)		(0.299)		(0.012)
$\text{Coord}_{(\text{t-1})}$		8.152***		16.900***		17.105***		
		(0.774)		(1.763)		(3.139)		
Const.	12.645***	15.064***	17.023***	19.188***	111.960***	104.544***	[0.351]	[0.351]
	(2.148)	(1.815)	(2.469)	(2.145)	(8.236)	(7.410)		
ll	-11780	-10609.1	-19759.7	-18038	-21234.1	-19343.8	-577.95	-577.282
$Wald - \chi^2$	21.168	275.064	10.581	146.425	14.459	61.255	13.87	15
$p > \chi^2$	0.000	0.000	0.005	0.000	0.001	0.000	0.001	0.002
Obs.	2880	2640	3840	3520	3840	3520	960	960

Notes: Models (1) to (6) report coefficient estimates (standard errors in parentheses) from two-way linear random effects models accounting for both potential individual dependency over rounds and dependency within the group. Models (7) and (8) report marginal effects from Probit models. Trend is a linear time trend that starts from 0; $\text{Coord}_{(\text{t-1})}$ is a dummy that takes a value of 1 if the subject's group reached the threshold for one of the public goods in the previous round. Results remain qualitatively unchanged when adding all the treatment interactions with $\text{Coord}_{(\text{t-1})}$ and trend. Results are available upon request. Significance levels: * $p < 0.100$, ** $p < 0.050$, *** $p < 0.010$.

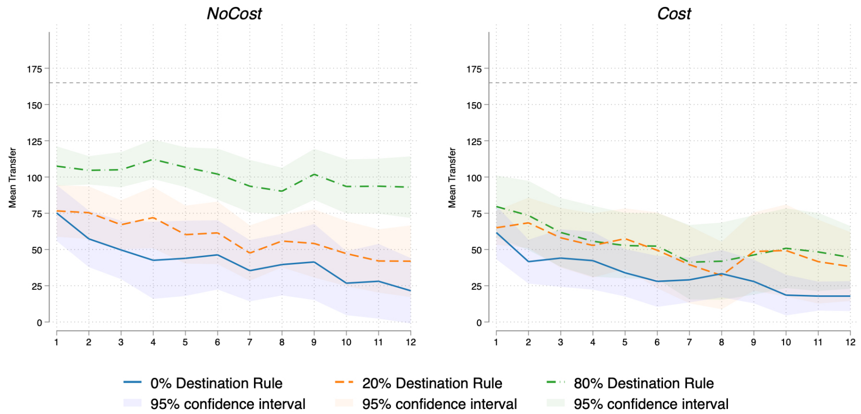
Table 4 Differences across treatments in transfers to the intermediary, overall contributions, coordination, and profits: parametric analysis

	(1) Transf. Del	(2) Transf. Del	(3) Cont	(4) Cont	(5) Profit	(6) Profit	(7) Coord	(8) Coord
$20Rule_{NoCost}$	5.735	5.391*	4.127	2.657	8.471	6.413	0.106	0.106
	(3.881)	(3.215)	(4.665)	(3.352)	(14.689)	(12.906)	(0.389)	(0.389)
$80Rule_{NoCost}$	19.414***	15.575***	17.558***	8.645**	67.401***	53.997***	0.583***	0.584***
	(3.750)	(3.139)	(4.507)	(3.412)	(14.191)	(12.601)	(0.387)	(0.388)
$NoRule_{Cost}$	-2.73	-2.032	1.457	2.274	-9.978	-9.76	-0.068	-0.069
	(3.883)	(3.216)	(4.664)	(3.349)	(14.689)	(12.904)	(0.392)	(0.393)
$20Rule_{Cost}$	2.84	2.485	1.551	-0.149	13.885	8.428	0.127	0.127
	(3.882)	(3.216)	(4.665)	(3.353)	(14.689)	(12.907)	(0.426)	(0.426)
$80Rule_{Cost}$	4.000	3.777	3.894	3.304	3.949	0.808	0.077	0.077
	(3.883)	(3.216)	(4.664)	(3.348)	(14.689)	(12.904)	(0.432)	(0.432)
Trend		-0.818***		-1.102***		1.199***		-0.006
		(0.074)		(0.213)		(0.299)		(0.013)
$\text{Coord}_{(\text{t-1})}$		8.046***		16.144***		16.921***		
		(0.776)		(1.841)		(3.141)		
Const.	14.009***	16.102***	16.295***	18.216***	116.949***	109.464***	[0.355]	[0.355]
	(2.745)	(2.324)	(3.299)	(2.726)	(10.387)	(9.331)		
ll	-11771.9	-10601.9	-19755.1	-18036.2	-21225	-19335.3	-528.426	-527.673
$Wald-\chi^2$	43.852	306.413	21.441	151.32	38.771	90.222	37.17	36.95
$p>\chi^2$	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001
Obs.	2880	2640	3840	3520	3840	3520	960	960

Notes: Models (1) to (6) report coefficient estimates (standard errors in parentheses) from two-way linear random effects models accounting for both potential individual dependency over rounds and dependency within the group. Models (7) and (8) report marginal effects from Probit models. Trend is a linear time trend that starts from 0; $\text{Coord}_{(\text{t-1})}$ is a dummy that takes a value of 1 if the subject's group reached the threshold for one of the public goods in the previous round. Results remain qualitatively unchanged when adding all the treatment interactions with $\text{Coord}_{(\text{t-1})}$ and trend. Results are available upon request. Significance levels: * $p < 0.100$, ** $p < 0.050$, *** $p < 0.010$.

$p < 0.010$). Moreover, there also does not seem to be a difference in the transferred amounts across any of the treatments with overhead costs. Similar conclusions are drawn from examining the same figures plotted side-by-side for the other three outcome variables (see Figures A1, A2 and A3 respectively in Appendix A).

Fig. 3 Transfers to the intermediary, in *NoCost* (left panel) and *Cost* (right panel) treatments.



We investigate the previous observations in Table 5. The overhead costs exert a strong negative effect on the majority of the outcomes, with this result remaining significant after controlling for a linear trend as well as successful coordination in the previous round. Furthermore, we find that these effects do not depend on the size of the overhead costs (i.e. 20, 35 or 50 points), with comparable results being observed for all three cost levels (see Table A1 in Appendix A).

Result 2: *The overhead costs imposed on the intermediary significantly reduce transfers to the intermediary, contributions to the public goods, successful coordination and overall profits.*

Estimates in Table 4 suggest that the main difference with respect to the treatments without costs is that the positive effect of the 80% destination rule is undone in the presence of the theoretically irrelevant overhead costs imposed on the intermediary: the coefficient of $80Rule_{Cost}$ is smaller and no longer statistically significant at any conventional level ($p = 0.121$).

Result 3: *Thus the overhead costs imposed on the intermediary nullify the positive effects of the 80% destination rule on transfers to the intermediary, overall contributions, coordination, and profits.*

Table 5 The effect of overhead costs imposed on the intermediary: parametric analysis

	(1) Transf. Del	(2) Transf. Del	(3) Cont	(4) Cont	(5) Profit	(6) Profit	(7) Coord	(8) Coord
$Cost_{(dummy)}$	-7.553***	-5.978***	-5.431*	-1.921	-24.726**	-21.889***	-0.203***	-0.203***
	(2.622)	(2.148)	(2.934)	(1.976)	(9.825)	(8.425)	(0.227)	(0.227)
Trend		-0.818***		-1.097***		1.201***		-0.005
		(0.074)		(0.213)		(0.299)		(0.011)
$\text{Coord}_{(\text{t-1})}$		8.148***		17.446***		17.272***		
		(0.776)		(1.738)		(3.135)		
Const.	22.932***	23.464***	24.027***	21.581***	144.294***	131.080***	[0.357]	[0.357]
	(1.830)	(1.606)	(2.048)	(2.048)	(6.860)	(6.323)		
ll	-11785.4	-10614.6	-19763	-18040.1	-21237.7	-19346.2	-607.036	-606.417
$Wald-\chi^2$	8.297	253.696	3.427	138.925	6.334	54.126	5.89	6.72
$p>\chi^2$	0.004	0.001	0.064	0.000	0.012	0.000	0.015	0.034
Obs.	2880	2640	3840	3520	3840	3520	960	960

Notes: Models (1) to (6) report coefficient estimates (standard errors in parentheses) from two-way linear random effects models accounting for both potential individual dependency over rounds and dependency within the group. Models (7) and (8) report marginal effects from Probit models. Trend is a linear time trend that starts from 0; $\text{Coord}_{(\text{t-1})}$ is a dummy that takes a value of 1 if the subject's group reached the threshold for one of the public goods in the previous round. Results remain qualitatively unchanged when adding all the treatment interactions with $\text{Coord}_{(\text{t-1})}$ and trend. Results are available upon request. Significance levels: * $p < 0.100$, ** $p < 0.050$, *** $p < 0.010$.

5.5 Why do the (sunk) overhead costs reduce cooperation and coordination?

In the real world, donors may perceive an NGO with a high overhead ratio as being inefficient in converting their donations into a real contribution toward the cause. In our design, we are able to rule out this explanation since costs are sunk at the time donations are solicited and they do not affect the rate at which transfers to the intermediary are converted into contributions to the public good. However, one reason that donors might be deterred by a sunk overhead cost in our setting is the ex-ante inequality that this cost creates among the donors and the intermediary. To see why, we consider the two treatments in which the impact of the costs were most pronounced, namely the $\mathit{80Rule}_{NoCost}$ and the $\mathit{80Rule}_{Cost}$ treatments. In the $\mathit{80Rule}_{NoCost}$ treatment, despite the intermediary having some opportunity to expropriate donors' transfers, she is ex-ante in exactly the same position as the donors. The donors have little reason to believe she will expropriate *any* of their transfers if doing so means forgoing the collective benefit from effectively funding a public good. Thus, in the absence of costs, donors may believe the rate at which their transfers are converted into contributions is actually even higher than 80%. As a result, starting right from the first round, the first-stage transfers from donors are high enough for the intermediary to be able to effectively fund one of the public goods. In contrast, in the $\mathit{80Rule}_{Cost}$ treatment, if zero contributions are made to the public good, the intermediary will earn less than the donors due to the sunk overhead cost. As a result of this ex-ante inequality, donors might believe that the intermediary feels entitled to use any first-stage transfers to cover these costs. In other words, the perceived conversion rate of transfers to contributions drops back down to the mandatory 80% in this treatment. If donors perceive this rate as simply too low to prevent anti social expropriation at the expense of funding the public good, then starting right from the first round, they should be less inclined to transfer their money to the intermediary. If the intermediary receives less than is required to fund the public good at its threshold, she will transfer only the minimum 80% and expropriate the rest. In subsequent rounds, donors will be even less trusting and so the chance of effectively funding any public good will continue to remain low.

To test these claims, we compared transfers to the intermediary in the first round with and without costs under the 80% destination rule. We observe that the average of individual transfers by group members to the intermediary in the first round was significantly lower in $\mathit{80Rule}_{Cost}$ compared to *80Rule* (mean transfers of 6.538 and 35.822 respectively, MWU-test $p = 0.012$), a result that is consistent with the idea that donors expect the intermediary to expropriate their transfers when sunk costs are imposed. However, when examining the intermediary's behavior, we find that, as long as she receives a sufficient amount to unilaterally fund one of the public goods, there is no difference in the amount the intermediary contributes to the public goods in the $\mathit{80Rule}_{Cost}$ (36.10 tokens) and *80Rule* treatments (39.81 tokens) (MWU-test $p > 0.200$). This indicates that, contrary to what donors might suspect, the intermediary does not behave in a less trustworthy manner in the presence of these costs. This is further supported by the fact that across all rounds, conditional on successful coordination, the intermediary does not expropriate more in the $\mathit{80Rule}_{NoCost}$ treatment (7.778%) compared to the

80Rule$_{Cost}$ (11.111%) (MWU-test $p > 0.100$). Finally, we also find that the intermediary's behavior does not depend on how many times she was an intermediary in previous rounds: Table A3 in Appendix A shows that after controlling for coordination in previous rounds and the total amount received by the intermediary, the intermediary's experience with being in this role is not correlated with her contributions to the public goods.

Result 4*: Overhead costs reduce the effectiveness of a high 80% destination rule because they reduce donors' willingness to coordinate via the intermediary. However, as long as sufficient funds are transferred, intermediaries do not change expropriate more when they incur a sunk overhead cost.*

5.6 Robustness checks

In order to test the robustness of our main findings, we run a series of additional ex-post treatments. Since the overhead costs were a significant proportion of the intermediary's mean profits in our original treatments, we first investigated whether the detrimental effects of the overhead costs persist even if these costs are made substantially smaller. We thus ran an additional treatment, namely the *80Rule*$_{MarginalCost}$ (with 8 independent groups). This treatment replicates the *80Rule*$_{Cost}$ in all respects but for the size of the overhead costs which are set to one fifth of the original ones at 4, 7 and 10 points.

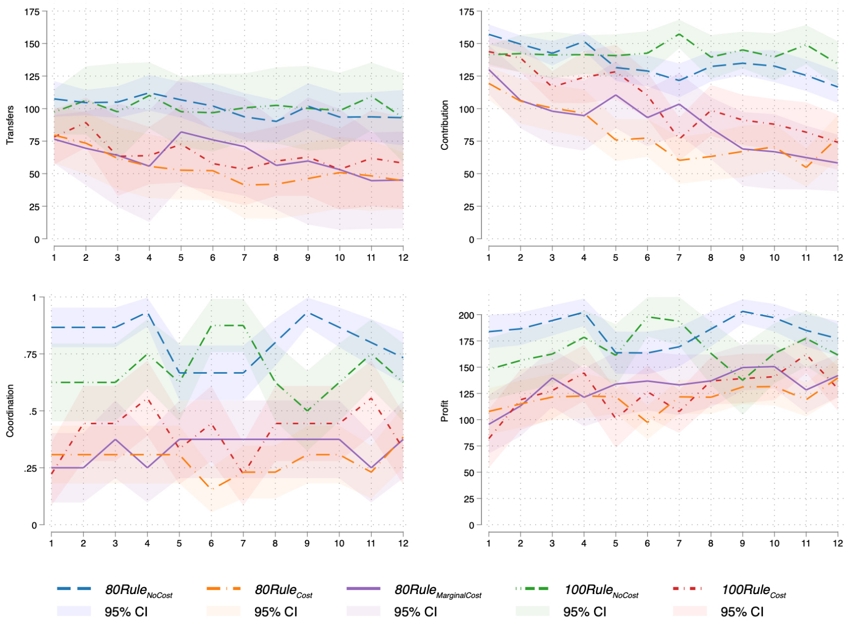
As a further robustness check, we also ran two treatments with a 100% destination rule, namely the *100Rule* and *100Rule*$_{Cost}$ treatments. Our objective in running these treatments was to test whether the (original) overhead costs exert a negative effect on coordination and cooperation even when the intermediary has no discretion over the donors' transfers to her. We note here that the *100Rule* treatment is also a direct replication of the *DelRule* treatment in CCR. We ran two sessions for both the *100Rule* and *100Rule*$_{Cost}$ treatments, collecting data from a total of 8 independent groups in the *100Rule* treatment and nine independent groups in the *100Rule*$_{Cost}$ treatment.

All additional sessions were run in November 2022 with participants from the same subject pool. In order to preserve comparability with the other treatments, the additional treatments were also run online with z-Tree Unleashed.

Results of these additional treatments can be seen in Figure 4 and Table A2 and confirm the validity of the findings from the main treatments, specifically with respect to the destructive impact of the overhead costs. First, when comparing the *80Rule*$_{Cost}$ treatment with the *80Rule*$_{MarginalCost}$ treatment, we find negligible differences in the amount transferred to the intermediary (MWU-test, $p = 0.075$), overall contributions to the public goods (MWU-test, $p = 0.133$) and the proportion of groups who successfully reached the threshold (MWU-test, $p = 0.085$). The only significant difference we detect concerns the fact that subjects in the *80Rule*$_{MarginalCost}$ treatment earn slightly more than in the *80Rule*$_{Cost}$ treatment (MWU-test, $p = 0.050$).

Second, we document a strong negative impact of the overhead costs on cooperation and coordination even when the intermediary is restricted by a 100% destination rule. Indeed, we find that the amount transferred to the intermediary, overall contributions, proportion of groups who successfully reached

Fig. 4 Transfers to the intermediary, overall contributions, coordination, and profits, by round for robustness checks



the threshold, and profits are significantly higher in the *100Rule* treatment than in the *100Rule*$_{Cost}$ treatment (MWU-test, $p < 0.001$ in all cases).

The additional treatments also allow us to assess how increasing the destination rule from 80% to 100% influences the main outcome variables. With no overhead costs, we find that overall contributions and the proportion of groups who successfully reached the threshold are significantly higher in the *100Rule* treatment than in the *80Rule* treatment (MWU-test, $p < 0.01$ in both cases). We detect no remarkable differences in the amount transferred to the intermediary (MWU-test, $p = 0.670$) and in profits (MWU-test, $p = 0.074$) between the two treatments. When overhead costs are introduced, we find that the amount transferred to the intermediary, overall contributions and the proportion of groups who successfully reached the threshold are significantly higher in the *100Rule*$_{Cost}$ treatment than in the *80Rule*$_{Cost}$ treatment (MWU-test, $p < 0.001$ in all cases). However, there are no significant differences in net profits (MWU-test, $p = 0.734$) between these two treatments.

In summary, our robustness checks confirm that there is a the positive impact of increasing the level of restrictions imposed on the intermediary. More importantly, they show that overhead costs have a negative impact even when i) they are of negligible size and ii) the intermediary has no discretion over donor funds.

6 Conclusion

We explored changes in subjects' public good contributions stemming from different conditions imposed on an intermediary through whom it is possible to coordinate contributions. Our experimental treatments varied the extent to which intermediaries could expropriate donors' contributions for themselves (via a destination rule) and the presence and size of a sunk cost that was incurred by the intermediary regardless of whether or not any public good was successfully funded.

We find that in the absence of the overhead costs imposed on the intermediary, donors behave exactly as standard theory predicts, increasing their transfers to the intermediary when there is a low possibility for said intermediaries to expropriate their contributions (i.e. in case of the 80% destination rule) but not increasing their transfers to the intermediary vis-a-vis the baseline no-restriction setting or when a theoretically too low "expressive" contribution rule is imposed on the intermediary. We did however find a surprising and theoretically puzzling effect of the sunk cost incurred by the intermediary, namely that donors are very sensitive to the *presence* (but not the size) of these sunk costs, reducing their transfers to the intermediary to such an extent that the positive effect of the 80% destination rule is completely undone, resulting in public good provision dropping to the baseline *NoRule* levels.

Our results support the findings from existing studies where it has been shown that donors are sensitive to the "price" of giving, exhibiting an aversion to any cost that is not directly program-related including fundraising or administrative costs that are necessary to keep the organization in existence and running smoothly. For instance, Bowman (2006); Meer (2014). Gneezy et al. (2014) and Portillo and Stinn (2018) find that people are more likely to donate to a charity when they know that their contribution will not be spent on covering the overhead associated with the charity. These papers suggest that when donors can be certain their contributions will not be spent on covering overhead costs, they are more likely to trust the charity, and this is perhaps in part because they can now be sure the charity will not try to use their donation to cover costs that have already been incurred. However, we show that the distrust of the intermediaries created in our setting as a result of the overhead cost is unjustified because as long as the intermediary has sufficient funds to reach the threshold, she behaves in the same way across regardless of whether or not she incurs an overhead cost.

Overall, our results suggest that intermediaries (NGOs, Community Chests or charities) that are already required to disclose their overhead ratios would benefit from making donors aware that their donations will *not* be used to cover costs that have already been incurred at the time of fundraising.

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ONLINE APPENDIX

Coordinating Donations via an Intermediary
The Destructive Effect of a Sunk Overhead Cost

A Additional results: tables and figures

Fig. A1 Total contributions to the public good, by *NoCost* treatments (left panel) and *Cost* treatments (right panel), and by round.

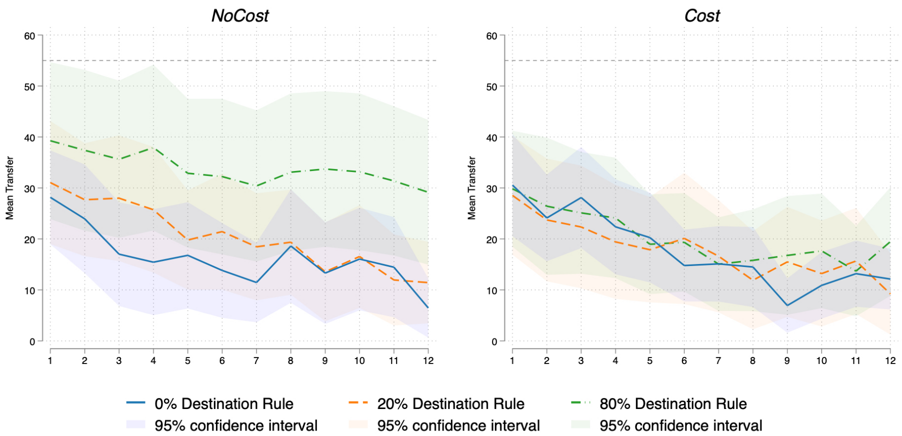


Fig. A2 Proportion of groups successfully coordinating, by *NoCost* treatments (left panel) and *Cost* treatments (right panel), and by round.

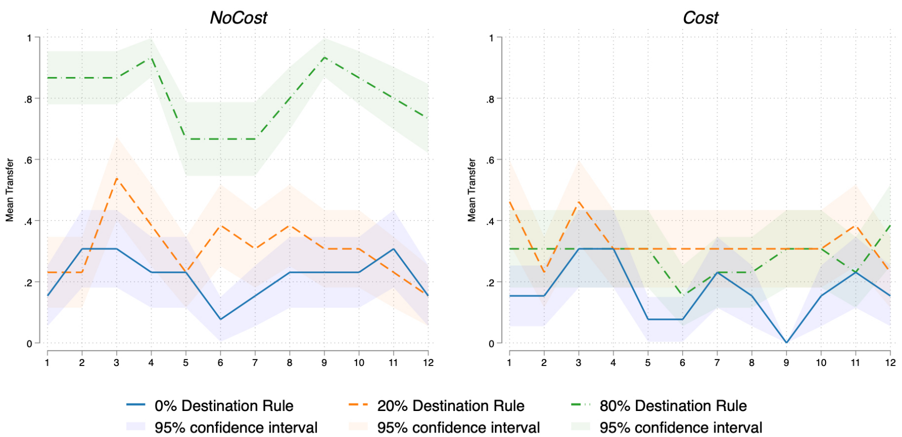


Fig. A3 Individual Profits, by *NoCost* treatments (left panel) and *Cost* treatments (right panel), and by round.

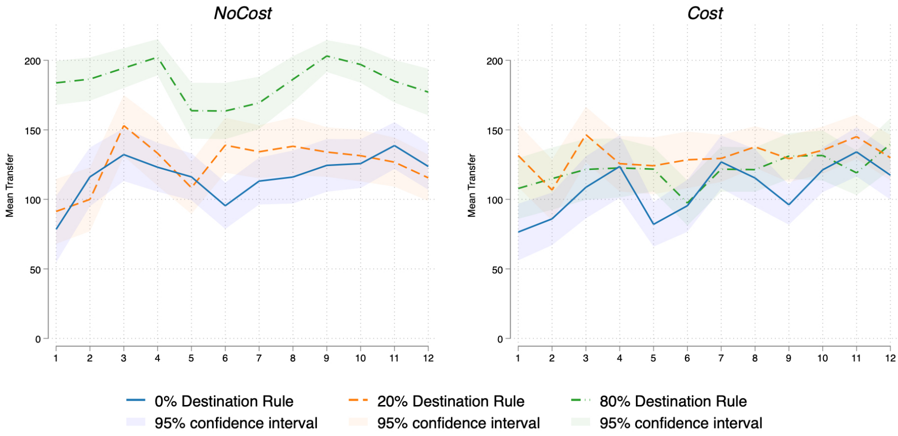


Table A1 Effects of different cost levels on key outcome variables relative all baseline treatments without costs.

	(1) Transf. Del	(2) Transf. Del	(3) Cont	(4) Cont	(5) Profit	(6) Profit	(7) Coord	(8) Coord
Cost20	-7.362***	-5.700**	-4.702	-0.333	-27.680***	-22.625***	-0.173*	-0.173*
	(2.676)	(2.214)	(3.256)	(2.446)	(10.046)	(8.692)	(0.261)	(0.261)
Cost35	-7.067***	-5.443**	-6.849**	-3.293	-24.884**	-22.924***	-0.215***	-0.214***
	(2.673)	(2.202)	(3.237)	(2.380)	(10.032)	(8.641)	(0.249)	(0.250)
Cost50	-8.176***	-6.775***	-4.780	-1.908	-21.896**	-20.168**	-0.174**	-0.175**
	(2.668)	(2.204)	(3.209)	(2.388)	(10.013)	(8.651)	(0.244)	(0.245)
Trend		-0.818***		-1.103***		1.199***		-0.005
		(0.074)		(0.213)		(0.299)		(0.011)
$\text{Coord}_{(\text{t-1})}$		8.116***		17.621***		17.317***		
		(0.776)		(1.731)		(3.139)		
Const.	22.932***	23.474***	24.027***	21.534***	144.294***	131.067***	[0.357]	[0.357]
	(1.830)	(1.606)	(2.045)	(2.038)	(6.865)	(6.323)		
ll	-11784.583	-10613.249	-19762.436	-18039.413	-21236.306	-19345.799	-606.502	-605.896
$Wald-\chi^2$	10.028	256.566	4.496	142.954	9.152	54.906	6.81	7.42
$p>\chi^2$	0.018	0.000	0.213	0.000	0.027	0.000	0.0783	0.1154
Obs.	2880	2640	3840	3520	3840	3520	960	960

Notes: Models (1) to (6) report coefficient estimates (standard errors in parentheses) from two-way linear random effects models accounting for both potential individual dependency over rounds and dependency within the group. Models (7) and (8) report marginal effects from Probit models. Trend is a linear time trend that starts from 0; $\text{Coord}_{(\text{t-1})}$ is a dummy that takes a value of 1 if the subject's group reached the threshold for one of the public goods in the previous round. Results remain qualitatively unchanged when adding all the treatment interactions with $\text{Coord}_{(\text{t-1})}$ and trend. Results are available upon request. Significance levels: * $p<0.100$, ** $p<0.050$, *** $p<0.010$.

Table A2 Transfers to the intermediary, overall contributions, proportion of contributions by the intermediary, coordination, and profits: descriptive statistics, for robustness checks.

	Transf. Del (*t=1*)	Transf. Del (*All*)	Cont (*t=1*)	Cont (*All*)	Cont Del (*t=1*)	Cont Del (*All*)	Profit (*t=1*)	Profit (*All*)	Coord (*t=1*)	Coord (*All*)
100Rule	32.458	33.608	35.375	36.078	0.890	0.932	147.875	166.740	0.625	0.677
	(14.826)	(17.794)	(56.269)	(63.302)	(0.096)	(0.144)	(85.774)	(81.530)	(0.492)	(0.468)
100Rule_Cost	26.074	21.506	35.944	26.505	0.687	0.802	82.000	126.407	0.222	0.407
	(17.957)	(18.331)	(45.955)	(45.104)	(0.205)	(0.210)	(84.979)	(76.559)	(0.422)	(0.492)
80Rule_MarginalCost	25.167	18.403	28.063	19.870	0.827	0.869	100.125	125.615	0.250	0.250
	(16.959)	(22.290)	(40.011)	(48.529)	(0.125)	(0.196)	(76.451)	(73.342)	(0.447)	(0.434)
N	63	756	84	1008	21	231	84	1008	84	1008

Notes: This table reports average values of the four key outcome variables – amounts transferred to the intermediary (Transf. Del), overall contributions to the public goods (Cont), proportion of contributions by the intermediary on overall contributions to the public goods (Cont Del), final profits (Profit) and proportion of groups who successfully coordinated reaching the threshold (Coord) – in the first round (*t=1*) and then aggregated across all rounds (*All*). Standard deviations are reported in parentheses.

Table A3 Contributions to public accounts by the Delegate (#counter).

	(1) Cont	(2) Cont	(3) Cont	(4) Cont	(5) Cont	(6) Cont
$20Rule_{NoCost}$	-0.7357	-3.3799	-0.7779	16.6503	-3.3274	-0.7040
	(5.8786)	(5.3069)	(5.8637)	(15.8872)	(5.3022)	(5.8643)
$80Rule_{NoCost}$	22.1247***	14.7173***	21.9627***	83.4485***	14.8101***	22.1172***
	(5.9092)	(5.4542)	(5.9129)	(15.3472)	(5.4526)	(5.9177)
$NoRule_{Cost}$	-1.0495	-2.5462	-1.0481	-10.1485	-2.6034	-1.1230
	(5.9178)	(5.3132)	(5.9017)	(15.9147)	(5.3086)	(5.9023)
$20Rule_{Cost}$	3.9427	0.1541	3.9062	12.9750	0.1852	3.9470
	(5.8928)	(5.3077)	(5.8778)	(15.9003)	(5.3023)	(5.8776)
$80Rule_{Cost}$	6.4313	4.8182	6.3645	18.7786	4.7669	6.3125
	(5.9250)	(5.3343)	(5.9124)	(15.9204)	(5.3293)	(5.9124)
Sum transfers to Del.	1.0614***	1.0575***	1.0643***		1.0567***	1.0623***
	(0.0298)	(0.0352)	(0.0310)		(0.0353)	(0.0312)
$\text{Coord}_{(t-1)}$		9.8399***			9.8240***	
		(2.8737)			(2.8729)	
Delegate #counter		0.1813	0.1996	-12.7505***	-0.6898	-0.8855
		(0.6998)	(0.6685)	(2.5426)	(1.9802)	(1.9122)
Delegate $\#\text{counter}^2$				1.0476***	0.1324	0.1691
				(0.3785)	(0.2818)	(0.2795)
Const.	1.1817	0.4443	0.6217	67.9255***	1.5736	1.9968
	(4.3397)	(4.3394)	(4.6998)	(11.7403)	(4.9608)	(5.2182)
ll	-4601.7560	-4189.8867	-4601.7121	-4923.8455	-4189.7767	-4601.5293
$Wald-\chi^2$	1625.0017	1824.2836	1629.3333	106.5331	1827.5214	1630.4820
$p > \chi^2$	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	960	880	960	960	880	960

Notes: Models (1) to (6) report coefficient estimates (standard errors in parentheses) from two-way linear random effects models accounting for both potential individual dependency over rounds and dependency within the group. The models focus on delegates only and their overall contributions to public accounts. $Coord_{(t-1)}$ is a dummy that takes value = 1 if the subject's group reached the threshold for one of the public goods in the previous round. *Sum transfers to Del.* is a continuous variable capturing the amount sent by the group's members to the delegate. *Delegate #counter* is an individual-specific counter variable measuring how many times a subject in the role of delegate has been in the role of delegate in the previous rounds.
Significance levels: * $p < 0.100$, ** $p < 0.050$, *** $p < 0.010$.

B Instructions

Example of Instructions for *20Rule*$_{Cost}$ treatment. Full instructions for all treatments available in online supplementary material.

Instructions

By following the subsequent instructions carefully, you can earn, based on your choices, an amount that will be sent to you after the experiment.

During the experiment

Please note that during the experiment, it is not allowed to communicate in any way with the other participants. If you have any questions, please write it into the private chat on Zoom and one of the experimenters will respond.

General rules

In this experiment, there are 12 periods. At the beginning of the experiment, you will be randomly and anonymously assigned to a group of four participants. Note that you will never find out the identity or the earnings of any of the other three members of your group. The composition of your group will remain unchanged throughout the experiment.

How earnings are determined

In each of the 12 periods, you and each of the other members in your group will receive an initial endowment of 55 tokens. Thus, the group will have a total of 220 tokens in each period.

During each period, you will participate in two consecutive phases.

PHASE 1: How many tokens to transfer to the DELEGATE?

At the beginning of PHASE 1, a computer will randomly assign one of the four members of your group to the role of DELEGATE. If you are the DELEGATE, then you will not make any choice in PHASE 1. On the other hand, if you are NOT the DELEGATE, then you will have to choose how many of the 55 tokens of your initial endowment to transfer to the DELEGATE. At the end of PHASE 1, the computer will inform you how many tokens have been transferred by the members of your group to the DELEGATE as well as your ACTUAL ENDOWMENT.

In particular,

- if you are the DELEGATE, you will participate in PHASE 2 with an ACTUAL ENDOWMENT of 55 tokens plus any tokens transferred to you by the other group members in PHASE 1.
- Instead, if you are NOT the DELEGATE, you will participate in PHASE 2 with an ACTUAL ENDOWMENT of 55 tokens minus what you have transferred to the DELEGATE in PHASE 1.

Note that, regardless of the choices made by you and your group members in PHASE 1, your group will have a total of 220 tokens in PHASE 2.

PHASE 2: How many tokens do you want to allocate to the PRIVATE ACCOUNT and the COLLECTIVE ACCOUNTS?

In PHASE 2, you have to decide how to allocate your ACTUAL ENDOWMENT between a PRIVATE ACCOUNT and twelve COLLECTIVE ACCOUNTS that are named WHITE, YELLOW, GREEN, RED, VIOLET, BLUE, GRAY, PURPLE, BROWN, PINK, BLACK and ORANGE. The thirteen accounts generate a return expressed in points according to the following rules:

PRIVATE ACCOUNT: You obtain points from the PRIVATE ACCOUNT every time you allocate tokens to it. In particular, for each token you allocate to the PRIVATE ACCOUNT, you obtain 2 points.
COLLECTIVE ACCOUNTS: You obtain points from any of the twelve COLLECTIVE ACCOUNTS if and only if the number of tokens allocated to it by your group is greater than or equal to a pre-specified number that is called the ”threshold”. The threshold is the same across all the twelve collective accounts and is equal to 132 tokens. In particular:

(a) If the number of tokens allocated to a COLLECTIVE ACCOUNT by your group is less than the threshold of 132 tokens, then you will not obtain any points from the tokens that you or any of your group members allocated to that COLLECTIVE ACCOUNT.

(b) If the number of tokens allocated to a COLLECTIVE ACCOUNT by your group is greater than or equal to the threshold of 132 tokens, then:

- For each token allocated by your group into that COLLECTIVE ACCOUNT, you will obtain 1 point.
- In addition, all members of the group will receive a “bonus” in points. The size of the bonus depends on the COLLECTIVE ACCOUNT to which the tokens were allocated. In periods 1, 5 and 9, the computer will randomly select four of the twelve COLLECTIVE ACCOUNTS and the bonus assigned to these COLLECTIVE ACCOUNTS will consist of 30 points, while the bonus assigned to the remaining eight COLLECTIVE ACCOUNTS will consist of 20 points. The four COLLECTIVE ACCOUNTS with the higher bonus will be the same for all members of the group and will remain unchanged for the three subsequent periods.

COST for the DELEGATE

If you are assigned to the role of DELEGATE in a given period, then you will incur a COST that will reduce your earnings in points in that period. In particular, in each period, the computer will randomly select the COST for the DELEGATE from one of three possible values: 20, 35 or 50 points.

The COST for the DELEGATE will be displayed to all members of the group in PHASE 1 of that period. If you are not the delegate, then you will not incur any cost in that period.

How to make your choice in PHASE 2

At the beginning of PHASE 2, the computer will display your ACTUAL ENDOWMENT and thirteen input fields, one for the PRIVATE ACCOUNT and one for each of the twelve COLLECTIVE ACCOUNTS. In each of the twelve input fields associated with the COLLECTIVE ACCOUNTS, the computer will display the bonus size, 20 or 30 points, associated with that COLLECTIVE ACCOUNT in that period. For each member of the group, the order in which the twelve COLLECTIVE ACCOUNTS are displayed on the screen is randomly determined by the computer. The number of tokens you allocate to the accounts cannot be greater than your ACTUAL ENDOWMENT. In fact, the sum of your allocations to the different accounts must be exactly equal to your ACTUAL ENDOWMENT.

Additionally, note that if you are the DELEGATE, the sum of your allocations to the COLLECTIVE ACCOUNTS cannot be less than 50% of the number of tokens transferred to you by the other group members in PHASE 1. This means that the DELEGATE is required to allocate into the twelve COLLECTIVE ACCOUNTS a number of tokens greater than or equal to 50% of the tokens that s/he receives from the other members of the group.

At the end of PHASE 2 of each period, the computer will display:

- how many tokens you allocated to the PRIVATE ACCOUNT,
- how many tokens you allocated to each of the twelve COLLECTIVE ACCOUNTS,
- how many tokens have been allocated by your group to each of the twelve COLLECTIVE ACCOUNTS,
- how many points you obtained from the PRIVATE ACCOUNT,
- how many points you obtained from each of the twelve COLLECTIVE ACCOUNTS and
- how many points you obtained in total in the period.

Note that if you are the DELEGATE, the COST for the DELEGATE in that period will be subtracted from your earnings in that period. At the end of the experiment the total number of points you have obtained across the 12 periods will be converted into CZK at the rate: **100 points = 15 CZK.**

The following table summarizes how to calculate your earnings in points in a generic period of the experiment:

<table>
<tr><td colspan="2">You have an initial endowment of 55 tokens. Each of the other 3 people in your group also have 55 tokens. Thus, your group has a total of 220 tokens.</td></tr>
<tr><td colspan="2">PHASE 1
The computer randomly assigns one member of your group to represent the DELEGATE. You will first see the COST for the DELEGATE which can take one of 3 possible values: 20, 35 or 50 points. Each group member not assigned to the role of DELEGATE chooses how many of their 55 tokens to transfer to the DELEGATE. These choices are then used to determine the ACTUAL ENDOWMENT:

If you are the DELEGATE, your ACTUAL ENDOWMENT = 55 tokens + tokens transferred by the other group members.
If you are NOT the DELEGATE, your ACTUAL ENDOWMENT = 55 tokens - tokens you transferred to the DELEGATE.

Regardless of your choices in PHASE 1, your group will have a total of 220 tokens in PHASE 2.</td></tr>
<tr><td colspan="2">PHASE 2
You must decide how to split your ACTUAL ENDOWMENT of tokens between a PRIVATE ACCOUNT and the twelve COLLECTIVE ACCOUNTS.
The DELEGATE must allocate at least 50% of the tokens received from the other group members in PHASE 1 into the COLLECTIVE ACCOUNTS .
The accounts generate a return in points based on the following rules:</td></tr>
<tr><td>Tokens allocated to PRIVATE ACCOUNT</td><td>Return = 2 points for every token you allocate into your PRIVATE ACCOUNT.</td></tr>
<tr><td>Tokens allocated to the 12 COLLECTIVE ACCOUNTS: "WHITE", "YELLOW", "GREEN", "RED", "VIOLET", "BLUE", "GRAY", "PURPPLE", "BROWN", "PINK", "BLACK" and "ORANGE"</td><td>• If the number of tokens allocated by your group into one of the twelve COLLECTIVE ACCOUNTS equals or exceeds the 132 token threshold, then your return from that account =
▪ 1 point for each token allocated by your group into that COLLECTIVE ACCOUNT
▪ + A bonus of 30 points if the COLLECTIVE ACCOUNT is among the four collective accounts selected to have the higher bonus in that block of four periods.
OR + A bonus of 20 points if the COLLECTIVE ACCOUNT is not among those four collective accounts that have the higher bonus in that block of four periods.

• If the number of tokens allocated by your group into any given COLLECTIVE ACCOUNT is below the threshold of 132 tokens, then your return from that account = 0 points</td></tr>
</table>

SUMMARY OF YOUR EARNINGS IN A GENERIC PERIOD OF THE EXPERIMENT

IF YOU ARE THE DELEGATE,

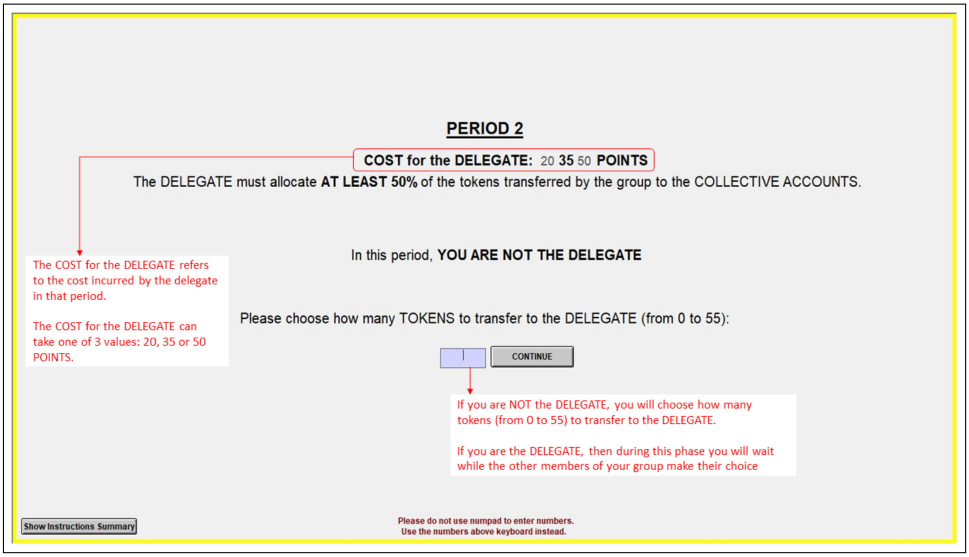
YOUR EARNINGS IN A GIVEN PERIOD =

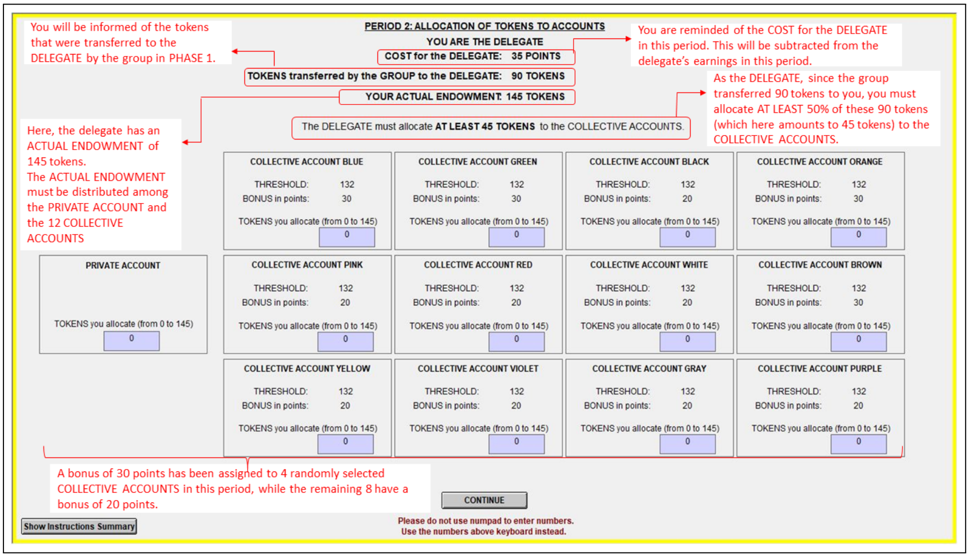
POINTS FROM THE PRIVATE ACCOUNT + POINTS FROM THE 12 COLLECTIVE ACCOUNTS – COST FOR THE DELEGATE.

IF YOU ARE NOT THE DELEGATE,

YOUR EARNINGS IN A GIVEN PERIOD =

POINTS FROM THE PRIVATE ACCOUNT + POINTS FROM THE 12 COLLECTIVE ACCOUNTS.


PERIOD 2
COST for the DELEGATE: 20 35 50 POINTS
The DELEGATE must allocate AT LEAST 50% of the tokens transferred by the group to the COLLECTIVE ACCOUNTS.
The COST for the DELEGATE refers to the cost incurred by the delegate in that period.
The COST for the DELEGATE can take one of 3 values: 20, 35 or 50 POINTS.
In this period, YOU ARE NOT THE DELEGATE
Please choose how many TOKENS to transfer to the DELEGATE (from 0 to 55):
CONTINUE
If you are NOT the DELEGATE, you will choose how many tokens (from 0 to 55) to transfer to the DELEGATE.
If you are the DELEGATE, then during this phase you will wait while the other members of your group make their choice
Show Instructions Summary
Please do not use numpad to enter numbers.
Use the numbers above keyboard instead.


PERIOD 2: ALLOCATION OF TOKENS TO ACCOUNTS
YOU ARE THE DELEGATE
COST for the DELEGATE: 35 POINTS
TOKENS transferred by the GROUP to the DELEGATE: 90 TOKENS
YOUR ACTUAL ENDOWMENT: 145 TOKENS
The DELEGATE must allocate AT LEAST 45 TOKENS to the COLLECTIVE ACCOUNTS.
You will be informed of the tokens that were transferred to the DELEGATE by the group in PHASE 1.
You are reminded of the COST for the DELEGATE in this period. This will be subtracted from the delegate's earnings in this period.
As the DELEGATE, since the group transferred 90 tokens to you, you must allocate AT LEAST 50% of these 90 tokens (which here amounts to 45 tokens) to the COLLECTIVE ACCOUNTS.
Here, the delegate has an ACTUAL ENDOWMENT of 145 tokens.
The ACTUAL ENDOWMENT must be distributed among the PRIVATE ACCOUNT and the 12 COLLECTIVE ACCOUNTS
COLLECTIVE ACCOUNT BLUE THRESHOLD: 132 BONUS in points: 30 TOKENS you allocate (from 0 to 145) 0
COLLECTIVE ACCOUNT GREEN THRESHOLD: 132 BONUS in points: 30 TOKENS you allocate (from 0 to 145) 0
COLLECTIVE ACCOUNT BLACK THRESHOLD: 132 BONUS in points: 20 TOKENS you allocate (from 0 to 145) 0
COLLECTIVE ACCOUNT ORANGE THRESHOLD: 132 BONUS in points: 30 TOKENS you allocate (from 0 to 145) 0
PRIVATE ACCOUNT TOKENS you allocate (from 0 to 145) 0
COLLECTIVE ACCOUNT PINK THRESHOLD: 132 BONUS in points: 20 TOKENS you allocate (from 0 to 145) 0
COLLECTIVE ACCOUNT RED THRESHOLD: 132 BONUS in points: 20 TOKENS you allocate (from 0 to 145) 0
COLLECTIVE ACCOUNT WHITE THRESHOLD: 132 BONUS in points: 20 TOKENS you allocate (from 0 to 145) 0
COLLECTIVE ACCOUNT BROWN THRESHOLD: 132 BONUS in points: 30 TOKENS you allocate (from 0 to 145) 0
COLLECTIVE ACCOUNT YELLOW THRESHOLD: 132 BONUS in points: 20 TOKENS you allocate (from 0 to 145) 0
COLLECTIVE ACCOUNT VIOLET THRESHOLD: 132 BONUS in points: 20 TOKENS you allocate (from 0 to 145) 0
COLLECTIVE ACCOUNT GRAY THRESHOLD: 132 BONUS in points: 20 TOKENS you allocate (from 0 to 145) 0
COLLECTIVE ACCOUNT PURPLE THRESHOLD: 132 BONUS in points: 20 TOKENS you allocate (from 0 to 145) 0
A bonus of 30 points has been assigned to 4 randomly selected COLLECTIVE ACCOUNTS in this period, while the remaining 8 have a bonus of 20 points.
CONTINUE
Show Instructions Summary
Please do not use numpad to enter numbers.
Use the numbers above keyboard instead.