Scholarly Article

Periodic Versus Aggregate Donations: Leveraging Donation Frequencies to Cultivate the Regular Donor Portfolio

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Abstract

Charitable organizations play a key role in society but face the recurrent challenge of obtaining sufficient resources to accomplish their missions. The regular donor portfolio becomes a critical element in providing stable and long-lasting funding, and its effective management has emerged as a key research area. This study investigates the impact of the donation frequency by regular donors on their donation amount over time. Drawing from temporal reframing literature, we provide an understanding of these effects as well as the moderating role of the motivations to donate (self- vs other-oriented). The study also investigates the extent to which frequency choices are influenced by the motivations to donate and by the donation options presented during registration. Using a sample of regular donors from 2013 to 2019 and applying dynamic panel data techniques, the findings reveal that higher frequencies lead to higher donations, though this effect is strengthened by self-oriented motivations and weakened by other-oriented motivations. Our study shows that motivations to donate and donation options jointly explain donation frequencies. This study provides useful guidance for charities on how to increase regular donors' perceived value and their contributions to help these organizations provide essential services to the most vulnerable groups in society.

Keywords

donation frequency, donation amount, temporal reframing, perceived value, motivations to donate, donation options, panel data, charitable giving

Introduction

Service research considers the study of the relationship between services and well-being a key priority (Ostrom et al. 2015), highlighting the need for research "that aims to create uplifting changes and improvements in the well-being of individuals" (p. 140). This societal focus underscores the central role of charitable organizations that provide essential community services aimed at the most disadvantaged groups and sectors (Boenigk et al. 2021; Fang, Fombelle, and Bolton 2021) within the service ecosystem. Unfortunately, today charitable organizations struggle to access sufficient economic resources to fulfill their missions. The global economic crisis caused by the COVID-19 pandemic and the resulting increase in social problems (e.g., growing inequalities, more people in need) are creating strong pressures for funding. Fundraisers fundamentally rely on the support of individuals, as they remain as the largest source of income, accounting for 69% of the contributions made by the private sector (US$324.10 billion; Giving USA 2021). However, the decreasing trend in these contributions over time (Charities Aid Foundation 2021) is jeopardizing the execution of many social projects and the very survival of charities. In this context, the regular donor portfolio adopts an essential role, since it guarantees stable funding that allows the accomplishment of the organization's goals (Drollinger 2018; Sargeant and Woodliffe 2007). The challenge, therefore, is how to retain and cultivate the regular donor portfolio (Nonprofit Research Collaborative 2019).

The focus of this study is on the frequency with which regular donors provide their monetary contributions to charity and its impact on their donation amounts. Regular donors commit to providing an annual contribution to the organization, which can be distributed in different frequencies such as yearly (once a year), quarterly (four times a year), or monthly (twelve times a year). For example, a $120 donation in a year can be provided as $120 yearly, $30 quarterly, or $10 monthly. The effects of different levels of aggregation of economic sums on individual perceptions and behaviors have received increasing

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Table 1. Literature Review on Temporal Reframing of Donations and the Role of Donation Frequency on Donation Amount.

Source	Type of donor	Frequency of Donation (Level of Aggregation)	Heterogeneity (Moderators)	Drivers of Frequency	Data	Research Method	Key Findings
Gourville (1998)	Occasional	✓	Suggested amount	X	Cross-sectional	Field experiment	Daily frame transactions (aggregate frame) result in higher (lower) compliance with donation requests
Verhaert and Van den Poel (2012)	Occasional	X	Seed money strategy	X	Cross-sectional	Field experiment	Donors who have donated more frequently are more likely to donate and to contribute greater amounts (especially when the threshold is rather high).
De Bruyn and Prokopec (2013)	Regular/ Occasional	X	Suggested amount	X	Cross-sectional	Field experiment	Frequent donors show greater likelihood to donate but appear less susceptible to appeal scale manipulations.
Hladká and Hyánek (2015)	Occasional	X	X	Motives (investment, egoistic and altruistic)	Cross-sectional	Field data	Respondents who identify with egoistic motives donate higher amounts and more frequently.
Sudhir, Roy and Cherian (2016)	Occasional	✓	Past behavior	X	Cross-sectional	Field experiment	Monthly temporal framing generates more donors and more donations than the daily framing. As the giving rates are higher among past donors, the money raised is larger.
Atlas and Bartels (2018)	Occasional	✓	Perceptions (costs and benefits; advantages and disadvantages) and affective involvement	X	Cross-sectional	Field experiment	Daily frame increases donation intentions by changing the perceived benefits of donating and the mental representation of the contract's benefits. Daily donations increase intentions when high-affective involvement is present.
Basu (2021)	Occasional	✓	Perceived sacrifice and benefit to the recipient	X	Cross-sectional	Field experiment	When altruistic actions are framed in periodic, donation is perceived as less moral. An aggregate-framed act increases observers' perception of the donors' sacrifice and the perceived magnitude of their help to the beneficiary.
Our study	Regular	✓	Type of donor (other- vs self-oriented)	Type of donor and donation options	Longitudinal	Field data	Higher frequencies of donations increase (reduce) donation amounts of self- (other-) oriented donors. Donation options lead to choose higher frequencies, especially for self-oriented donors.

attention in recent years in the temporal reframing literature (Bambauer-Sachse and Grewal 2011; Hershfield, Shu, and Benartzi 2020; Sudhir, Roy and Cherian 2016). Temporal reframing has become popular due to its ample use in for-profit contexts, where companies frequently resort to this strategy to trivialize the costs and make them appear more affordable. Previous studies have demonstrated that less aggregated sums of money (e.g., $1 a day vs. $365 a year) lead to higher purchase intentions (Bambauer-Sachse and Grewal 2011; Hershfield, Shu, and Benartzi 2020), because framing a price in a series of small payments reduces the perceived cost of the spend.

Whether less aggregated payment schedules lead to more donations in the context of charitable giving represents an important research question. The previous work in for-profit contexts has focused exclusively on the cost side of the transaction; that is, less aggregated sums of money are perceived as more affordable, under the logic that the benefits provided by the goods or services received are not fundamentally altered by the payment structure. Individuals who donate to charity, however, do not receive any specific good/service in exchange (McCort 1994), and they can derive different types of utility from the act of donating (i.e., egoistic and altruistic, Song et al. 2021). This makes valuation of the benefits from donating particularly subject to several aspects of the interaction, including the one we study in our research—donation frequencies (Atlas and Bartels 2018). How do periodic versus aggregate donations impact the perceived benefits and costs from the donations?

While the literature has devoted an increasing attention to investigating the amounts individuals donate to charity and their drivers (Johnson and Park 2021; Shang and Croson 2009), studies have frequently ignored the role played by donation frequencies. Table 1 offers a review of the relevant work investigating actual donation amounts. From this table we can identify a number of important gaps. First, only a few studies investigate the impact of the level of aggregation in the donations on the donation amounts (Basu 2021; Atlas and Bartels 2018; Gourville 1998, Sudhir, Roy and Cherian 2016). Second, the focus of these studies is solely on occasional donors. Regular donors, however, represent a key source of stable economic resources for charities, and the higher commitment to the organization's goals and mission makes them engage in other important behaviors such as volunteering and activism (Bradford 2021). Third, given the study design (lab or field experiments), previous studies focused on the consequences of the donation frequencies on the donation amount, thus preventing from providing an understanding of the factors that explain the choice of frequencies by individuals in the first place. Finally, previous studies use cross-sectional information, which limits the ability to understand potential dynamics of donation frequencies over time.

To fill these gaps, the present study focuses on regular donors—representing the main source of income for charitable organizations—and the main goal is to investigate the impact of different frequencies of donations (e.g., yearly, bi-yearly, quarterly, monthly) on their donation amounts over time. We adopt a perceived value approach where donors evaluate their donations based on the perceived costs (e.g., economic sacrifice) and benefits (i.e., satisfaction from helping others and personal well-being) resulting from their donations (Atlas and Bartels 2018; Basu 2021). We test our theoretical predictions in a field study using a representative sample of 5168 regular donors of a charitable organization in Europe observed over a 7-year period (2013–2019). We apply dynamic panel data techniques and find that higher frequencies lead to higher donations, with this effect varying greatly among donors based on their motivation to donate (i.e., stronger for selfish motives, weaker for altruistic motives). Our study also sheds light on the drivers of the choice of donation frequency by showing that both internal (motivations to donate) and external (donation options) factors jointly explain the decision to donate more versus less frequently to the organization.

The present study contributes to service theory and practice in several important ways. First, it addresses recent calls for research at the intersection between service and well-being (Ostrom et al. 2021), underscoring the importance of engaging individuals in regular contributions to charity to ensure these organizations can provide essential services to society (Bolton 2020; Alkire et al. 2019). Second, our research offers novel insights into how the frequency with which regular donors donate to the organization affects their donation amounts over time. Specifically, the study demonstrates the importance of the motivations to donate (i.e., other-oriented and self-oriented motivations) as a central moderator in the relationship between perceived benefits and costs and the donation amounts, thus allowing for a more nuanced understanding of temporal framing effects than that previously provided by the literature. Third, our research contributes to a better understanding of the factors explaining the choice of donation frequencies. These choices depend crucially on the individual motivations to donate (self-oriented and other-oriented), as we show that donors tend to choose those frequencies that maximize the perceived value of their donations, but can also be influenced by the presence of donation options during donor registration. This aspect has significant managerial value, as it suggests that organizations can actively manage the donation frequencies of their donors in a way that maximizes both donor perceived value and the contributions made by donors. Finally, and at a more general level, this study enhances understanding of the donor portfolio and donors' contributions over time, offering important practical insights that can aid in the effective management of the donor base.

Conceptual Framework

To gain a better understanding of how different donation frequencies can influence the monetary contributions that regular donors make to an organization over time, we propose a conceptual framework that links the frequency of donation and the donation amount. In developing our framework, we have drawn on the literature on temporal reframing (Gourville 1998). This literature is concerned with understanding the psychological and

behavioral responses of individuals to a similar amount of money that is framed in a more versus less aggregate way. In the domain of charitable giving, framing a similar donation amount in different levels of aggregation (e.g., yearly, bi-yearly, quarterly, monthly) may have important consequences not only on the perceived costs, as emphasized by previous research, but also on the perceived benefits associated with that particular donation (Atlas and Bartels 2018), thereby influencing the perceived value from the donation and the amount individuals will be willing to donate in subsequent periods. Our framework provides an understanding of the impact of different frequencies of donation on the donation amount based on a discussion of the perceived value (i.e., benefits vs. costs) derived by the donor from the different donation frequencies. Importantly, we expect the impact of donation frequencies on the donation amount to be heterogeneous across donors (Atlas and Bartels 2018). Previous research has noted the importance of considering the motives that drive individuals to give when investigating donation amounts (Webb, Green, and Brashear 2000). Two key motivations have been identified by the literature (Andreoni 1989; Cornelis, Van Hiel, and De Cremer 2013): (i) helping others (i.e., other-oriented motivation) and (ii) deriving a private benefit (i.e., self-oriented motivation).

Given this study's demonstration of the central role played by donation frequencies in explaining the donation amount, another goal of our research is to understand why individuals choose different donation frequencies in the first place. To this end, we focus on internal and external factors by considering the donors' motivations to donate (help others and private benefit) and the donation options included in the request when individuals register as regular donors to the organization. Gaining a better understanding of this phenomenon not only offers novel insights into the drivers of donation frequencies but can also provide helpful advice for charities in their endeavor to engage their donors and increase their contributions. Figure 1 offers a graphical representation of the model.

A Perceived Value Approach to Understanding the Impact of the Donation Frequency on the Donation Amount: The Moderating Role of the Motivations to Donate

To understand the impact of different donation frequencies on the donation amount, we adopt a perceived value approach. Donating to charity involves both benefits and costs to the donors, which are evaluated on an ongoing basis to determine the perceived value of their donations. Perceived value, in turn, determines donors' decisions about how much to donate in subsequent periods. In this section, we discuss how different donation frequencies can lead to different perceived benefits and costs associated with the donations made.

Frequency of Donation and Perceived Costs of Donating. The cost of a donation for individuals involves a monetary sacrifice. The temporal reframing literature suggests that framing an amount of money in a less versus more aggregated way (e.g., daily vs. monthly vs. yearly) influences the perceptions of the affordability of the amounts, with less aggregation (e.g., $1 a day) leading to the perception that the cost is more trivial (i.e., a lower expenditure) compared with more aggregation (e.g., $365 a year; Shirai 2017). In the charitable context, Gourville (1998)

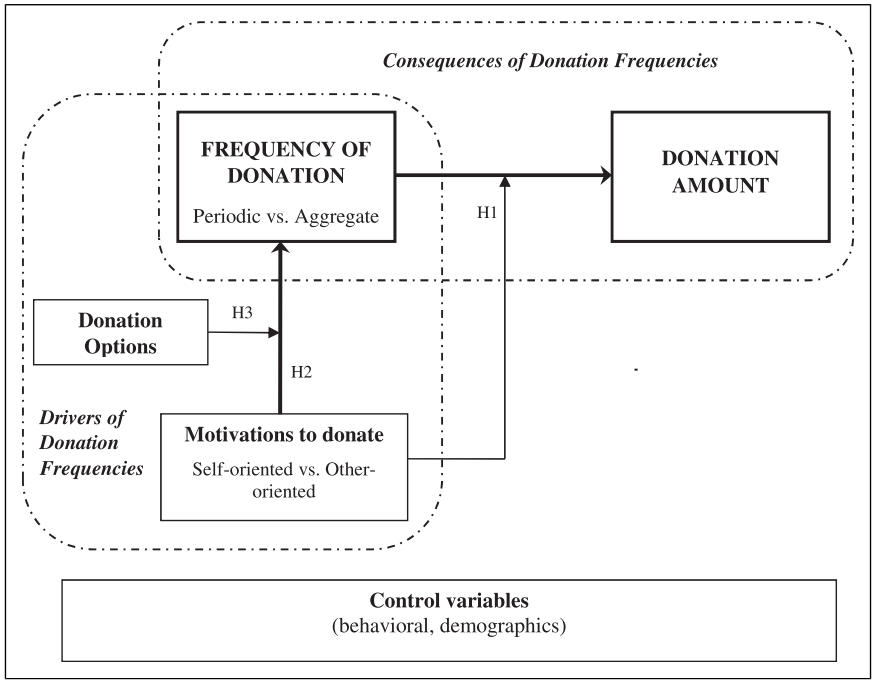

Figure 1. Conceptual Model.

referred to temporal reframing as a "pennies a day" (PAD) strategy and demonstrated that small amounts donated daily were preferred by donors over a large aggregate amount donated yearly. As this author reasoned, when faced with very disaggregated amounts, donors easily assimilate these small expenditures and judge them as similar to other trivial and affordable categories of frequent spending (e.g., coffee, lunch, and taxi fares). In contrast, the same amounts presented in a more aggregate way led donors to assimilate this larger expenditure and judge it as similar to other less frequent, and therefore less affordable, categories of spending (e.g., suits and vacations). Subsequent work has supported the general prediction of temporal reframing by showing that a disaggregated expenditure is judged to be more advantageous, more attractive, and less expensive (Atlas and Bartels 2018; Shirai 2017). Based on this, different donation frequencies can lead to different perceived costs for a similar donation amount, with higher frequencies expected to produce lower perceived costs compared with lower frequencies.

Frequency of Donation and Perceived Benefits of Donating. By engaging in donations, individuals can derive different types of benefits (Song et al., 2021). Previous literature has identified two main benefits associated with donating: (1) satisfaction from the good that the donations are doing for others who are in need, and (2) satisfaction from the good that the donations do for the donors themselves (Andreoni 1989; Cain, Dana, and Newman 2014; Shang et al. 2020). We argue that different frequencies of donation can affect these two benefits in different ways. Specifically, donating through higher frequencies (i.e., more disaggregated donation amounts) may lead to an increase in personal well-being (i.e., donors' warm glow). As demonstrated by Atlas and Bartels (2018), periodic donations lead donors to mentally represent the benefits in terms of multiple discrete events. Thus, higher frequencies, with the corresponding higher number of donation occasions (e.g., 12 with a monthly frequency vs. 1 with a yearly frequency), are expected to produce more frequent self-rewards in terms of personal satisfaction and positive emotional feelings. At the same time, a higher frequency of donations may lead to a decrease in the satisfaction derived from the help provided to others because donating smaller amounts (albeit more regularly) is expected to reduce the perceived help provided to others—that is, these small amounts may be seen as less significant when the objective is to provide financial support large enough to feel that important help is being given (Basu 2021; Batson and Shaw 1991; Moosmayer and Fuljahn 2010). On the other hand, lower frequencies of donation are expected to have the opposite effect. By providing their contributions in a more aggregated way, donors can thus perceive that they are making more impact with their donations, which will enhance the satisfaction from helping others (Basu 2021). However, donating less frequently will reduce the feeling of warm glow (personal well-being) as it produces a smaller number of self-rewards that ultimately help donors to feel good about themselves.

The above discussion suggests that, compared with more aggregated donations, periodic donations may lead to lower perceived costs for donors through a lower perceived monetary sacrifice. However, periodic donations can either increase or decrease a donor's perceived benefit from the donation. On the one hand, higher frequencies, by providing multiple discrete donation instances, may increase the perceived benefits relating to personal well-being; on the other hand, higher frequencies can reduce the perceived benefits associated with the contribution of the donations to helping others. To understand which of these effects may dominate, and thus to determine the ultimate impact of donation frequency on the donation amount, we suggest that donors weigh the costs and benefits derived from distinct frequencies differently depending on their motives for donating.

Contingent Role of Self- and Other-Oriented Motives. The literature on prosocial behavior has recognized the importance of donors' motivations to explain helping behavior (Cain, Dana, and Newman 2014; Webb, Green, and Brashear 2000). Following Andreoni (1989), there are two fundamental reasons, not mutually exclusive, why individuals can engage in these behaviors. One is an altruistic motivation to contribute to the well-being of recipients of the charity: people may be motivated to donate by the ultimate desire to help others and reduce their suffering (Webb, Green, and Brashear 2000). Another is an egoistic motivation to obtain a private benefit, such as deriving a positive emotional feeling or creating a positive self- or social image, by which helping behavior is performed mainly for the purpose of improving one's welfare and self-esteem. These are also labeled other-oriented and self-oriented motives, respectively, given the focus on others' welfare versus one's own welfare, which can be used to categorize donors into self- versus other-oriented (Cornelis, Van Hiel, and De Cremer 2013). As noted, these motives are not mutually exclusive, but can both influence donation decisions (Batson and Shaw 1991).

Self-Oriented Motivations. When individuals are driven by self-oriented motives, they put the focus on the psychological and intangible benefits they may experience after donating, such as a positive mood, or feeling good by doing good (Ottoni-Wilhelm, Vesterlund, and Xie 2017). When they perform prosocial behaviors, they are usually motivated by the desire to feel good about oneself or signal positive moral traits to oneself (Johnson and Park 2021). Through donations they can obtain personal rewards, such as increased self-esteem, avoid negative emotions that may arise from not donating (Bekkers and Wiepking 2011; Ferguson et al. 2012), and reinforce one's relevant sense of self (Shang et al. 2020). Thus, donors driven by these motivations will value personal well-being benefits more than other types of benefits derived from their donations, given that they are usually considered as more egoistic or extrinsically motivated (Batson and Shaw 1991) and can respond better to external incentives that are more focused on personal interest and rewards (Ariely, Bracha, and Meier 2009). Donors moved by self-oriented motives are also strongly interested in minimizing the monetary costs resulting from donations (Goeree, Holt, and Laury 2002). This is because they mainly care about personal outcomes such as private enjoyment, their sense of

personal worth as a donor, and avoidance of feelings of guilt (Ferguson et al. 2012). For them, a mere donation, even if low, may satisfy the selfish motivation to seek a warm glow and provide a sense of relief (Verhaert and Van den Poel 2011), and would at the same time avoid the excessive cost of donating large amounts. Therefore, a generous contribution would not be so important for them. Given this, compared with low donation frequencies, high donation frequencies may lead to lower perceived costs for these donors through smaller perceived sacrifices, and to increased perceived self-benefits that are strongly appreciated by these donors. Compared with lower donation frequencies, higher donation frequencies would ultimately lead these individuals to derive a higher perceived value from their donations (through higher perceived benefits and lower perceived costs) and, thus, to donate more.

Other-Oriented Motivations. Individuals who are driven by other-oriented motives care about the well-being of others and intend to maximize the impact of their contributions (Ferguson et al. 2012; Webb, Green, and Brashear 2000). These donors experience satisfaction derived from the feeling of being more helpful to recipients of the aid. One explanation for this motivation is based on the intrinsic incentive that the individual gets from making a greater effort or from spending (Imas 2014), which is determined by "internal" moral and ethical considerations (Deci and Ryan 1980) and by feelings of a social responsibility to make the world a better place (Bekkers and Wiepking 2011). The donations also imply costs to other-oriented donors due to the economic sacrifice, but these donors are less likely to weigh these costs strongly given their central focus on helping others (Goeree, Holt, and Laury 2002). This argument assumes that the act of donating is seen more in terms of the benefits provided to others than in terms of the cost to oneself (Basu 2021; Batson and Shaw 1991). Thus, donors moved by other-oriented motivations will put greater weight on increasing the well-being of others and helping in a significant way, regardless of the pain incurred by greater monetary sacrifice. Given this, other-oriented donors can derive higher value from donating with a low frequency (compared with a high frequency) because, as discussed, making contributions in a more aggregated way (larger sums) enhances the perceived impact of these contributions and the benefit of helping others. The perceived value from the donation will thus be higher for these donors when engaging in less frequent (more aggregated) donations.

The previous discussion suggests that the impact of donation frequency on the donation amount will depend on the motivations to donate. Other-oriented motivations will lead donors derive a lower perceived value from higher donation frequencies, thus resulting in less donations. In contrast, self-oriented motivations will lead donors derive a higher perceived value from higher donation frequencies, resulting in more donations. Based on this, we hypothesize:

H1: The positive impact of higher donation frequencies on donation amount (a) is diminished by stronger other-oriented motivations and (b) is enhanced by stronger self-oriented motivations.

Choice of Donation Frequency: The Roles of Motivations to Donate and Donation Options

Our study is also concerned with the factors explaining a donor's choice of frequency. In particular, given the previous prediction in H1, we want to know whether, in practice, donors who differ in their motivations to donate (whether to derive a private benefit or to help others) choose naturally those frequencies that maximize the value from the donation—in other words, whether there is a higher predisposition among self-oriented donors to choose high frequencies, and among other-oriented donors to choose low frequencies. We are also interested in the effects of introducing donation options by the organization on the choice of donation frequency. Very often, when individuals register as regular donors, organizations provide them with different donating options (e.g., the registration form might include a list with different options—monthly, quarterly, bi-yearly, yearly—and individuals can tick the most appropriate one). How do these options change the natural tendency of donors to choose their frequencies? And do these options help donors make better choices, namely, those that produce the highest perceived value? We intend to provide answers to these questions.

We start by assuming that individuals will naturally choose the donation frequency that maximizes their expected value (Verhaert and Van den Poel 2011). Prior to making their choices, individuals will try to anticipate the benefits and costs associated with the different options they have to arrive at a utility/value assessment (Tversky and Kahneman 1981). As discussed previously, donors driven by self-oriented motives may derive more value from more frequent donations, so, anticipating this, they are expected to have a higher predisposition to choose high donation frequencies. In contrast, those driven by other-oriented motives may derive more value from less frequent donations; therefore, they are expected to have a lower predisposition to choose high donation frequencies. Hence:

H2: Donor motivations impact donation frequency such that (a) stronger other-oriented motivations decrease the likelihood of choosing higher donation frequencies and (b) stronger self-oriented motivations increase the likelihood of choosing higher donation frequencies.

Now we discuss the role of donation options in the choice of frequency. When individuals register as donors, organizations often present them with different alternatives for the frequency of their donations. Previous research points to the importance of developing appropriate compliance strategies by presenting a set of available responses from which individuals can choose (Weyant 1996). The implementation of these types of compliance requests can provide important information to respondents, and they also act as reference frames that can alter donors' judgments and, thereby, their decision-making (De Bruyn and Prokopec 2013; Verhaert and Van den Poel 2012). This earlier evidence on the effect of appeal scales on donations suggests that donors will prefer the alternative that they consider most appropriate and that makes

their contribution possible. Therefore, when faced with different options, donors should choose that which is a priori the most advantageous and beneficial for them, and hence reject the rest. However, presenting different alternatives could make some donors aware that there are other donation options available, which, despite not initially being considered, could be seen as candidates (Weyant 1996). From the donation options provided during registration, individuals can infer information such as the organizations' needs or goals (Goswami and Urminsky 2016). According to Tversky and Kahneman (1981), the way in which a message is presented causes changes in preferences, which can be manipulated by changing the reference value of an individual.

Prior evidence suggests that the frequency with which a charity takes repeated actions to address certain social problems may affect consumer perceptions and therefore responses (Jin and He 2018). For example, for donors with other-oriented motivations—who are focused on providing meaningful assistance—seeing that the organization offers the possibility of donating more frequently may make them feel that more frequent help is needed in order to address short-term objectives requiring urgent intervention (American Red Cross 2020). In addition, these donors may interpret that the organization is interested in continuously addressing social problems and is persistent in achieving its objectives (Jin and He 2018). Although these donors may have a lower preference for donating more frequently through small amounts, presenting various donation options can alter their frequency preferences, leading to a choice that departs from the one that maximizes perceived value. Based on this explanation, it could be expected that presenting donation options can increase the likelihood of choosing more frequent donations for donors motivated by other-oriented reasons. On the other hand, for donors with self-oriented motivations—who are focused on achieving self-rewards and reducing the monetary sacrifice from their donations (Goeree, Holt, and Laury 2002)—facing a request that offers the opportunity to frame their donations in a more disaggregated way will encourage them to select high frequencies to make their contribution. These individuals may get the most value from choosing high frequencies, so the donation options presented will reinforce their willingness to choose these frequencies. The weight they attribute to minimizing costs is strong for these individuals, so less frequent donations involving higher payments in a more aggregated way will be less likely to be chosen. Hence:

> **H3**: The positive impact of presenting donation frequency options on the likelihood of choosing higher donation frequencies is enhanced by (a) stronger other-oriented motivations and (b) stronger self-oriented motivations.

Methodology

Sample and Data

We empirically test the proposed conceptual model using data from a charitable organization donor database in a major European country. The collaborating organization develops projects for social intervention in problems such as social and labor exclusion, and poverty or violence suffered by the neediest groups, and it provides aid to the most disadvantaged regions in the world. The data corresponds to a representative sample of 5168 regular donors (i.e., donors who have registered as members of the organization and collaborate providing funding on an ongoing basis) and contains longitudinal information over a 7-year period (2013–2019) on different aspects of the relationship between the donor and the organization, including (1) behavioral information (e.g., donation amounts, donation frequencies, previous occasional donor), (2) registering information (date of donor registration, donation options at registration), (3) communications (e.g., information/promotions sent to donors, channels of communication), and (4) sociodemographic data, which combines data provided by the organization, such as the demographic characteristics of the sample (gender, and type of residence area where the donor lives), with data obtained through external sources, such as socioeconomic characteristics (disposable income per capita). This comprehensive dataset enabled us to test empirically our hypotheses regarding the impact of different donation frequencies on the donation amount for different types of donors, as well as about the drivers of the donation frequencies. Table 2 contains a description of the operationalization of all variables in the study. Table 3 presents the descriptive statistics and correlations. Bellow, we explain in detail the operationalization of the central variables in the study.

Donation Amount. Donation amount is measured as the annual sum of all contributions made by donor i in year t. We log-transformed the variable ($lnAmount_{it}$) due to the skewed distribution.

Donation Frequency. This refers to the frequency with which donor i donates in year t. The information obtained from the data shows the different frequencies used: once a month; every two, three, and 4 months; twice a year, and once a year. However, as every two and 4 months are marginally used by regular donors,[1] we focused on the four most frequent options (monthly, quarterly, bi-yearly, and yearly) and created dummy variables for them (i.e., $Monthly_{it}$, $Quarterly_{it}$, $Bi\text{-}yearly_{it}$, with yearly acting as the base category).

Motivations to Donate. This study considers two main motivations that can drive individuals to donate to charity: helping others (i.e., other-oriented motivation) and deriving a private benefit (i.e., self-oriented motivation). We relied on behavioral data from the donor database to derive variables that can act as proxies for the donors' underlying motives to donate. Specifically, we created two variables, one for other-oriented motivation ($Other_{it}$), and one for self-oriented motivation ($Self_{it}$), each of which is composed of various behaviors that are indicative of those motivations. $Other_{it}$ is an ordinal variable which can take values from 0 to 3 depending on whether donor i engaged or not in the following behaviors: (i) agreeing to receive information, (ii) volunteering, and (iii) making extra donations, all of which are related to exhibiting concern about the well-being of others (other-oriented motivation). Similarly,

Table 2. Variable Operationalization.

Variable	Operationalization
Donation frequency	
Monthly	1 if donation frequency is monthly; 0 otherwise
Quarterly	1 if donation frequency is quarterly; 0 otherwise
Bi-yearly	1 if donation frequency is bi-yearly; 0 otherwise
Donation amount	Total amount donated (log-transformed) by donor *i* in year *t*
Motivations to donate	
Other-oriented	Index composed of three dummy variables: (i) Agree to receive information, (ii) volunteer, and (iii) extra donations. The index can take on the values 0, 1, 2, and 3 depending on the number of behaviors that donor *i* engaged in year *t* (higher number is indicative of a stronger other-oriented motivation)
Self-oriented	Index composed of three dummy variables: (i) extra donation in April and/or May, (ii) extra donation in second half of December, and (iii) increase in donation amount during 2015 and/or 2016. The index can take on the values 0, 1, 2, and 3 depending on the number of behaviors that donor *i* engaged in year *t* (higher number is indicative of a stronger self-oriented motivation)
Donation options	Dummy variable that takes the value 1 if donor *i* was presented donation options at registration; 0 otherwise
Controls	
Donation amount t-1	Total amount donated (log-transformed) by donor *i* in year *t-1*
Email	1 if donor *i* provides an e-mail address to the organization; 0 otherwise
Occasional donor	1 if donor *i* was a previous occasional donor at the organization before becoming a regular donor; 0 otherwise
Experience	Number of years donor *i* has been a regular donor of the organization in year *t*
Gender	1 if donor *i* is female; 0 if male
Income	Disposable income per capita in the residential area of donor *i* in year *t*
Residential area	1 if donor *i* lives in an urban area in year *t*, 0 if rural

$Self_{it}$ is an ordinal variable which can take values from 0 to 3 depending on whether donor *i* engaged or not in the following behaviors: (i) making extra donations in the months of April and May, (ii) making extra donations in the second half of December, and (iii) adjusting their regular donations during the years 2015 and/or 2016, all of which are related to exhibiting concern for personal, tax-related benefits. Higher values of these variables are indicative of stronger (self- and/or other-oriented) motivations. We provide additional details about the way these variables were operationalized and their appropriateness in Web Appendix A, where we also describe the results of an additional study carried out that demonstrates that the chosen variables are able to capture the underlying other- and self-oriented motivations by donors.

Donation Options. We capture the presence of donation options ($Options_{it}$) during the registration of the donor through a dummy variable that takes the value 1 if the request includes donation options for donor *i*, and 0 otherwise. The presence of donation options at registration depends on the channel through which individuals register as regular donors: donors who register online or physically are presented with options; those who register by telephone, e-mail, or fax are not.[2] The alternatives available in this request are fixed for all donors presented with these options (a total of four: monthly, quarterly, bi-yearly, and yearly). This is a reasonable number of options, as individuals' preferences show that they want a relatively small number of options from which to choose (Johnson et al. 2012).

We also consider control variables ($Controls_{it}$) that can impact the donation amount. We include behavioral factors such as the amount donated by donor *i* in the previous year ($lnAmount_{it-1}$), whether donor *i* provided her email address to the charity ($Email_i$), whether donor *i* was an occasional donor before registering as regular donor ($Occasional_i$), and the number of years as a regular donor ($Experience_{it}$). We select these factors following prior evidence suggesting that donations can be highly influenced by past donation behavior (Verhaert and Van den Poel 2012). We also include sociodemographic characteristics such as gender ($Gender_i$), income ($Income_{it}$), and type of residential area ($Area_{it}$).

Estimation Strategy and Procedure

Donation Amount Model. We developed an econometric model to derive the impact of the donation frequency (i.e., $Monthly_{it}$, $Quarterly_{it}$, $Bi\text{-}yearly_{it}$) on the donation amount ($Amount_{it}$) and to consider the moderating role of motivations to donate ($Other_{it}$ and $Self_{it}$). The model that we estimated is shown in the following equation (Equation 1)

$$\begin{aligned}\ln(\text{Amount}_{it}) = {} & \beta_0 + \beta_1 \text{Monthly}_{it} + \beta_2 \text{Quarterly}_{it} + \beta_3 \text{Biyearly}_{it} \\ & + \beta_4 \text{Other}_{it} + \beta_5 \text{Self}_{it} \\ & + \beta_6 \text{Monthly}_{it} \times \text{Other}_{it} + \beta_7 \text{Monthly}_{it} \times \text{Self}_{it} \\ & + \beta_8 \text{Quarterly}_{it} \times \text{Other}_{it} + \beta_9 \text{Quarterly}_{it} \times \text{Self}_{it} \\ & + \beta_{10} \text{Biyearly}_{it} \times \text{Other}_{it} + \beta_{11} \text{Biyearly}_{it} \times \text{Self}_{it} \\ & + \beta_{12} \text{Controls}_{it} + \varepsilon_{it}\end{aligned} \quad (1)$$

Table 3. Descriptive Statistics and Correlations.

Variable	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Monthly	0.23	0.42	0	1	1.00													
2 Quarterly	0.22	0.41	0	1	−0.42	1.00												
3 Bi-yearly	0.12	0.32	0	1	−0.31	−0.17	1.00											
4 Donation amount	201.52	295.18	1.44	5100	0.27	−0.02	−0.07	1.00										
5 Donation amount *t*-1	196.74	277.58	1.44	2280	0.27	−0.02	−0.07	0.91	1.00									
6 Other-oriented motivations	1.06	0.42	0	3	*−0.08*	0.05	0.05	0.15	0.11	1.00								
7 Self-oriented motivations	0.04	0.21	0	3	−0.00	0.01	0.01	0.21	0.14	0.36	1.00							
8 Donation options	0.78	0.41	0	1	0.18	0.03	−0.02	0.13	0.13	0.09	*0.01*	1.00						
9 Residential area	0.73	0.44	0	1	0.11	0.04	0.00	0.15	0.16	0.02	0.03	0.13	1.00					
10 Gender	0.45	0.49	0	1	−0.07	*−0.04*	0.01	*−0.08*	*−0.08*	0.02	*−0.01*	−0.17	−0.12	1.00				
11 Email	0.27	0.45	0	1	0.13	*0.04*	0.01	0.11	0.11	0.01	−0.03	0.25	0.17	−0.19	1.00			
12 Income	14078.76	4349.01	1516	30113	0.01	0.03	0.01	0.17	0.18	−0.02	−0.00	0.03	0.37	−0.03	0.07	1.00		
13 Previous donor	0.09	0.28	0	1	0.02	−0.00	*−0.03*	0.15	0.15	0.09	0.12	0.05	0.07	−0.05	−0.04	0.03	1.00	
14 Experience	15.48	12.05	0	54	−0.12	0.01	*0.01*	−0.03	−0.02	0.08	0.00	0.02	−0.10	−0.01	−0.16	−0.01	0.01	1.00

Notes: Nonsignificant correlations are italicized. Frequencies for the categorical variables (% in parenthesis): Monthly = 1189 (23%); Quarterly = 1137 (22%); Bi-yearly = 620 (12%); Donation options = 4031 (78%); Residential area (Urban) = 3773 (73%); Gender (Female) = 2325 (45%); Email = 1395 (27%) and Previous donor = 465 (9%). The low value for the statistic of Self-oriented motivations is due to the specific measures used for this variable, since it includes, for example, whether individuals increased their contributions in 2015 or 2016. Thus, a value of 1 can only appear in these years, although the mean considers the whole time horizon (2013–2019).

where $ln(Amount_{it})$, the dependent variable, is the donation amount by donor i in year t (log-transformed); $Monthly_{it}$, $Quarterly_{it}$ and $Bi\text{-}yearly_{it}$ are the dummy variables capturing the donation frequency by donor i in year t (with the yearly frequency acting as the base category); $Other_{it}$ and $Self_{it}$ indicate the degree to which an other-oriented and self-oriented motivation is present for donor i in year t, respectively; $Monthly_{it}$ X $Other_{it}$, $Monthly_{it}$ X $Self_{it}$, $Quarterly_{it}$ X $Other_{it}$, $Quarterly_{it}$ X $Self_{it}$, $Bi\text{-}yearly_{it}$ X $Other_{it}$, and $Bi\text{-}yearly_{it}$ X $Self_{it}$ are the interactions between frequency of donation and motivations to donate; $Controls_{it}$ is a vector of control variables; and ε_{it} is the error term. Our focus is on the parameters β_1–β_3, which capture the main effects of the donation frequencies on the donation amount, and β_6–β_{11}, which reflect the interactions between the donation frequency and the motivations to donate.

To derive the parameters of interest, we applied panel data techniques. We included in our model the lag of the dependent variable ($Amount_{it\text{-}1}$), given the likely influence of previous donations on current donations (Verhaert and Van den Poel 2012). We thus employed a dynamic model estimation approach. Specifically, in order to deal with the problem of multicollinearity of independent variables and individual effects derived from the fixed effects included in the models (Roodman 2009), we proceeded by using the System GMM estimator with a two-step robust estimation (Stata 16). Although this procedure is more efficient than the one-step estimator, the two-step estimator tends to show severely downward biased standard errors (Arellano and Bond 1991). Therefore, we used the *xtabond2* command because it corrects the finite sample of Windmeijer's (2005) two-step covariance matrix and allows the two-step robustness to be more efficient. The remaining independent variables in each model were incorporated into the instrument matrix.[3] The integration of these explanatory variables was performed step by step to identify and avoid problems of over-identification (generation of a high number of instruments) and allow a better adjustment of the model. To check whether the number of instruments was adequate, we used two tests. First, for each model, the Hansen test confirmed the validity of the instruments (Prob > $chi^2 \geq .05$). Second, the Arellano and Bond autocorrelation test proved the serial autocorrelation of the errors in first differences. This second test confirmed that the error terms were not serially correlated in the second order (Ar(2) pr > z > .05).

Donation Frequency Model. For the drivers of donation frequency, our dependent variable in this model, we investigated the impact of the motivations to donate ($Other_{it}$ and $Self_{it}$), and the moderating role of donation options ($Options_{it}$). In this model, we consider the donation frequency as a continuous variable that takes different values depending on the number of times that donor i donates (i.e.,1 for yearly; 2 for bi-yearly; 4 for quarterly; and 12 for monthly) in year t.[4] Thus, higher values are indicative of higher frequencies (less aggregation in payments). The model that we estimated is shown in the following equation (Equation (2))

$$\begin{aligned} \text{Frequency}_{it} = {} & \beta_0 + \beta_1 \text{Other}_{it} + \beta_2 \text{Self}_{it} + \beta_3 \text{Options}_{it} \\ & + \beta_4 \text{Other}_{it} \times \text{Options}_{it} + \beta_5 \text{Self}_{it} \times \text{Options}_{it} \\ & + \beta_6 \text{Controls}_{it} + \varepsilon_{it} \end{aligned} \tag{2}$$

where $Other_{it}$ and $Self_{it}$ indicate the degree to which an other-oriented and self-oriented motivation is present for donor i in year t, respectively; $Options_{it}$ refers to whether donation options are presented to the donor at registration; $Other_{it}$ X $Options_{it}$ and $Self_{it}$ X $Options_{it}$ are the interactions between the type of motivation and the presence of donation options; $Controls_{it}$ is the vector of control variables; and ε_{ijt} is an error term. The parameters of interest are β_1 *and* β_2, which indicate the main effects of the motivations to donate on the choice of donation frequency, and β_4 *and* β_5, which capture whether the presence of donation options alters the natural predisposition of other-oriented and self-oriented donors to choose the donation frequencies.

This model was tested using an ordinary least squares (OLS) regression. The OLS regression was performed by using the *regress* command in Stata (16). Because we need to assume heteroscedasticity in our model (Stock and Watson 2007), we use the robust option in the *regress* command, since Stata by default assumes homoscedastic standard errors. In addition, we checked the multicollinearity of the independent variables. When multicollinearity exists, standard errors can be inflated (Stock and Watson 2007), so we then run a postestimation command to check the appropriateness of the variance inflation factor. All indices were found to meet the necessary requirements and did not show multicollinearity problems (VIF < 10).

Findings

Donation Amount Model

A first look at the data showed that, on average, yearly donating results in a donation amount of €90.71, bi-yearly in €161.32, quarterly in €235.48, and monthly in €375.65. Thus, the donation amount increases when individuals donate more frequently ($F = 9442.99$; $p < .001$). We then performed the estimation of our formal models as described in the previous section, and proceeded to estimate the following three models sequentially: (i) a base model (Model 1) that analyzes the impact of the control variables on the donation amount; (ii) a model that, in addition to the control variables, includes the main effects of donation frequency and motivations to donate (Model 2); and (iii) a full model that considers the interaction terms between donation frequency and motivations to donate (Model 3). We report the coefficient estimates in Table 4. An overall F test shows that model fit significantly improves when adding each set of variables. Model 2 fits better than Model 1 with no explanatory variables: ($F(12, 5167) = 1035.13$, $p < .001$), and Model 3 significantly increases the explanatory power of the

different frequencies and their interaction with the donor motivations in comparison with Model 2, ($F(18, 5167) = 291.74$, $p < .001$). Among the three estimated models, Model 3 performs best according to the model fit statistics. We describe the results pertaining to Model 3 next.

The results show that higher frequencies lead to higher donation amounts ($\beta_{Monthly} = 2.403$; $p < .001$; $\beta_{Quarterly} = 1.865$; $p < .001$; $\beta_{Bi\text{-}yearly} = 1.265$; $p < .001$). They also show significant effects for the donation motivations, with other-oriented motivations having a positive effect ($\beta_{Other} = 1.733$; $p < .001$) and self-oriented motivations having a negative effect ($\beta_{Self} = -1.221$; $p < .001$) on the donation amount. Turning our attention to the moderating effects, we find that the positive impact of higher frequencies on donation amount decreases for other-oriented motives ($\beta_{MonthlyXOther} = -1.486$; $p < .001$; $\beta_{QuarterlyXOther} = -1.261$; $p = .001$; $\beta_{Bi\text{-}yearlyXOther} = -0.786$; $p < .01$), and increases for self-oriented motives ($\beta_{MonthlyXSelf} = 1.684$; $p = .001$; $\beta_{QuarterlyXSelf} = 1.738$; $p = .01$; $\beta_{Bi\text{-}yearlyXSelf} = 1.098$; $p < .05$). These results provide support to H1.

Regarding the set of control variables, the results show that behavioral variables are also important in explaining the donation amount. The amount donated in the previous year has a positive effect on the current donation ($\beta = 0.115$; $p < .05$); individuals who were occasional donors prior to becoming regular donors and those providing their e-mail address tend to provide greater amounts ($\beta = 0.409$; $p < .001$; $\beta = 0.460$; $p < .001$). However, those with more years of experience within the organization donate less ($\beta = -0.002$; $p < .001$). Sociodemographic variables also had an impact on the donation amount. The results suggest that living in an urban residential

Table 4. Estimation results for Donation Amount Model.

Dependent Variable: $\ln(Amount_{it})$	Controls Model 1	Main Effects Model 2	Interaction Effects Model 3
Intercept (β_0)	−1.673***(0.460)	−2.504***(0.357)	−3.479***(0.499)
Frequency			
Monthly$_{it}$		1.116***(0.174)	2.403***(0.287)
Quarterly$_{it}$		0.787***(0.135)	1.865***(0.286)
Bi-yearly$_{it}$		0.516***(0.098)	.1.265***(0.336)
Motivations			
Other$_{it}$		0.923***(0.059)	1.733***(0.222)
Self$_{it}$		−0.027(0.036)	−1.221***(0.369)
Interactions			
Monthly$_{it}$ *X Other*$_{it}$			−1.486***(0.280)
Quarterly$_{it}$ *X Other*$_{it}$			−1.261***(0.298)
Bi-yearly$_{it}$ *X Other*$_{it}$			−0.786***(0.295)
Monthly$_{it}$ *X Self*$_{it}$			1.684***(0.501)
Quarterly$_{it}$ *X Self*$_{it}$			1.738***(0.557)
Bi-yearly$_{it}$ *X Self*$_{it}$			1.098*(0.543)
Controls			
Donation amount$_{it-1}$	0.209*(0.106)	0.321***(0.108)	0.115*(0.045)
Urban$_{it}$	0.975***(0.150)	0.562***(0.098)	0.892***(0.101)
Female$_{it}$	0.026(0.029)	0.018(0.022)	0.024(0.029)
Email$_{it}$	0.559***(0.084)	0.268***(0.051)	0.460***(0.063)
Income$_{it}$	0.462***(0.073)	0.370***(0.065)	0.466***(0.056)
Previous donor$_{it}$	0.614***(0.093)	0.253***(0.093)	0.409***(0.074)
Experience$_{it}$	−0.007***(0.002)	−0.004***(0.001)	−0.002***(0.001)
F test			
F statistics	F (7, 5167) = 663.68	F (12, 5167) = 1035.13	F (18, 5167) = 291.74
Pr > F	0.000	0.000	0.000
Hansen test			
Chi^2	4.89	1.61	2.33
Prob>chi^2	0.087	0.447	0.506
Arellano-Bond test			
Ar(2)	0.248	0.246	0.746
z (Ar2)	1.16	1.16	−0.32

Note: Significant parameters: ***$p < .001$; **$p < .01$; *$p < .05$.

area (β = 0.892; $p < .001$) and having higher income levels (β = 0.466; $p < .001$) both have a positive and significant influence on the donation amount.

To check the robustness of the results, we estimated two alternative model specifications: (1) one where we treated the donation frequencies as endogenous, and (2) one where we changed the way donation frequency is operationalized (we included the change in the donation frequency over time, which serves as an additional test for the causality of this relationship). The results from these additional estimations are consistent with the main findings of our study. We provide additional details in Web Appendix B.

Donation Frequency Model

We report the coefficient estimates for the donation frequency model in Table 5. As explained above, an OLS regression was applied to derive the parameters of interest. We ran the following models sequentially: (i) Model 1 investigates the impact of the control variables on the choice of frequency; (ii) Model 2 includes the main effects of motivations to donate and donation options; and (iii) Model 3 adds the interaction terms between donor motivations and donation options. As can be seen in Table 5, model fit improves when each set of variables is added. In comparison with Model 1 and Model 2, Model 3 increases model fit significantly when the interactions between donor motivations and donation options are added ($F(11,13639) = 5.31$, $p < .001$). We discuss the results from Model 3 next.

The results suggest that the motivations to donate can influence the choice of frequency of donation. Although we did not find significant effects in Model 3, Model 2 (without the interaction terms) shows that the motivations to donate significantly influence the choice of donation frequency, with other-oriented motivations decreasing the probability of choosing higher frequencies ($\beta_{Other} = -0.972$; $p < .001$), and self-oriented motivations having a positive effect on the probability to select higher frequencies ($\beta_{Self} = 0.681$; $p < .001$), in line with our H2. The results from Model 3 also show that when donation options are included in the donation request, these increase the likelihood that donors choose higher donation frequencies ($\beta_{Options} = 3.006$; $p < .001$). Regarding the interaction effects between donor motivations and donation options, this interaction is negative and significant for other-oriented motivations ($\beta_{OtherXOptions} = -0.878$; $p < .01$). However, this negative interaction effect is not large enough to compensate for the strong positive impact of donation options on the choice of high frequencies for these donors, suggesting that for other-oriented donors the presence of donation options increases their probability of choosing higher frequencies of donation. The interaction is positive for self-oriented motivations, suggesting that donation options reinforce the choice of higher frequencies made by donors driven by self-oriented motives, though this is not significant. These results therefore only partially support H3.

As we did in the donation amount model, we also checked the robustness of the results for the donation frequency model. Specifically, we estimated an alternative model specification considering the dependent variable, donation frequency, as an ordinal variable, instead of as a continuous variable. The results offer consistent evidence for the main findings of our study. Web Appendix C provides additional details for this estimation.

Table 5. Estimation results for Donation Frequency Model.

Dependent Variable: $Frequency_{it}$	Controls Model 1	Main Effects Model 2	Interaction Effects Model 3
Intercept (β_0)	9.488***(1.359)	9.066***(1.346)	8.586***(1.354)
$Motivations_{it}$			
$Other_{it}$		−0.972***(0.099)	−0.235(0.248)
$Self_{it}$		0.681***(0.228)	0.204(0.554)
$Options_{it}$		2.113***(0.106)	3.006***(0.294)
Interactions			
$Other_{it}$ X $Options_{it}$			−0.878***(0.271)
$Self_{it}$ X $Options_{it}$			0.562(0.607)
Controls			
$Urban_{it}$	1.534***(0.134)	1.331***(0.133)	1.338***(0.133)
$Female_{it}$	−0.506***(0.085)	−0.275***(0.085)	−0.281***(0.084)
$Email_{it}$	1.115***(0.087)	0.769***(0.087)	0.768***(0.087)
$Income_{it}$	−0.414***(0.147)	−0.409***(0.144)	−0.438***(0.145)
$Previous\ donor_{it}$	0.303*(0.141)	0.269(0.140)	0.280*(0.014)
$Experience_{it}$	−0.118***(0.010)	−0.124***(0.010)	−0.121***(0.010)
F test			
F statistics	F (6,13644)= 113.29	F (9,13641) = 154.49	F (11, 113639) = 5.31
Pr > F	0.000	0.000	0.005

Note: Significant parameters: ***$p < .001$; **$p < .01$; *$p < .05$.

Discussion

Theoretical Implications

The present study contributes to the growing interest in research on service and well-being (Boenigk et al. 2021). This societal focus underscores the central role of charitable organizations that provide essential community services aimed at the most disadvantaged groups and sectors within the service ecosystem, and highlights the need for research in the area of consumer responsibility and proactivity for well-being (Ostrom et al. 2021). The focus of this study is on how to engage individuals to provide higher and more sustained contributions to charity in an attempt to alleviate the financial struggles that these organizations face, and to aid in their provision of essential community services to the more vulnerable groups in society.

In addressing this important research gap, this study offers a more comprehensive and nuanced understanding of consequences of donation frequencies on donation amounts. Only a few studies have investigated the temporal reframing of donations in the literature, and they have provided evidence of both positive and negative effects of higher frequencies (or lower levels of aggregation) on prosocial behavior (Atlas and Bartels 2018; Basu 2021; Gourville 1998; Sudhir, Roy and Cherian 2016). In this research, we underscore the heterogeneous nature of these effects and demonstrate that the impact of the frequency of donation on the donation amount is contingent on the motivations of individuals to donate (i.e., altruistic versus selfish motives, Andreoni 1989; Batson and Shaw 1991). Our results contribute to the temporal reframing literature by showing that while higher frequencies tend to promote higher donations, this effect is stronger for donors who are moved by self-oriented motives, and weaker for donors who are driven by other-oriented motives. Thus, the more nuanced understanding of the temporal reframing effects offered by this research enables us to reconcile the mixed findings in previous studies by introducing the important moderating role played by the motivations to donate.

We also provide novel conceptual insights into the reasons why different donation frequencies influence donation amounts in different ways based on a discussion of the cost–benefit evaluation and the perceived value individuals experience when donating. Previous studies in this domain have focused on how temporal reframing influences perceptions of costs, arguing that a series of small payments leads individuals to perceive the expenses as more affordable (Gourville 1998). However, the decision to donate is closely related to a set of subjective judgments about the cost and benefit associated with a particular donation (Basu 2021; Sargeant, West, and Ford 2001), and most donation decisions can be explained with reference to the benefits that will accrue to donors as a consequence of their gift (Konrath and Handy 2018). We propose that the frequency of donations influences the perceived benefits from the donation, including the personal well-being derived from doing good and the satisfaction obtained from helping others (Cornelis, Van Hiel, and De Cremer 2013; Ferguson et al. 2012). We demonstrate that not all donors are equally sensitive to the benefits and costs derived from their donations, leading to different perceived values that ultimately explain the heterogeneous effects on the donation amounts.

Given the central role played by donation frequencies in explaining the donation amounts, our research has also investigated the drivers of the choice of donation frequencies. Previous studies on the effects of donation frequencies in a nonprofit domain have relied on experiments (either in the lab or in the field; e.g., Atlas and Bartels 2018; Gourville 1998; Sudhir, Roy and Cherian 2016), with participants assigned randomly to different donation frequencies. While easing concerns about self-selection, this approach prevents an understanding of the drivers of the choice of frequency. Our study findings offer novel insights into the way in which different donors choose the frequency of their donations, demonstrating that they naturally tend to choose those donation frequencies that maximize perceived value. Specifically, compared with other-oriented donors, self-oriented donors are more likely to choose higher frequencies, in line with our theorizing based on perceived value. Importantly, this study shows that marketing activities in the form of presenting donation options at the time registration can alter the tendencies of individuals to choose the appropriate frequencies. While donation options reinforce the natural tendency among self-oriented donors to choose higher donation frequencies, for other-oriented donors the presence of donation options moves them away from the choices that maximize their perceived value. By presenting this finding, our research extends previous studies on the consequences of compliance requests for decision-making (Basu 2021; De Bruyn and Prokopec 2013; Verhaert and Van den Poel 2012). Overall, this study demonstrates that both internal and external factors play a key role in driving the choices of donation frequencies and offers additional evidence for the effectiveness of an adequate use of marketing activities in achieving societal benefits.

At a more general level, this study contributes to a better understanding of the donor portfolio, which represents the primary and most stable source of economic resources for charitable organizations. Previous research has usually focused on single donation requests directed at occasional donors (Atlas and Bartels 2018; Gourville 1998). Our work pays attention to the factors that drive membership retention and greater monetary donations, and adds new insights to the sparse literature on the issue of organizational membership in charitable giving (Fang, Fombelle, and Bolton 2021; Oh and Ki 2019; Ostrom et al. 2015). In particular, effective management of the donor base represents a major challenge for charitable organizations, and enhancing the perceived value from donations lies at the heart of any strategy that aims to cultivate and nurture a charity's relationship with donors (Sargeant, West, and Ford 2001). Our study offers novel insights into the evolution of donation amounts over time and the influence exerted by donation frequencies, providing valuable knowledge to aid in effective management of the donor base so that both donors' perceived value and their total contributions are maximized.

Managerial and Societal Implications

Building relationships with donors to engage them in regular donations and increase their contributions over time has become a major focus for charitable organizations in their attempt to provide essential community services and improve the well-being of individuals, especially in the current context marked by a decline in contributions made by individuals to social causes, and by reduced governmental support (Arnett et al. 2003; Fang et al. 2021; Venable et al. 2005). Our study suggests an opportunity for organizations to leverage the frequency of donations and enhance donors' perceived value and subsequent member engagement. In this spirit, the findings from our field study can be used to offer advice to organizations regarding how to accomplish this effectively to encourage further contributions that will enable charities to address a larger number of societal problems.

One important conclusion from our research is that higher frequencies of donation (e.g., daily vs. monthly vs. yearly) do not always lead to better outcomes, as previous studies in the temporal reframing literature have suggested. Based on the previous evidence, many organizations apply the "pennies a day" (PAD) strategy, especially in single donation requests for funding, under the assumption that presenting the amounts in a less aggregated way (i.e., lower sums) will produce higher compliance with the requests. The results of our study from a regular donor base advises against this general application of the PAD strategy, and instead suggests that organizations adapt the strategy to the different donor profiles as their differences can alter the perceived benefits and costs of the donations. More specifically, our study recommends distinguishing donors based on their motivations to donate, whether to provide a social benefit or a private benefit, and that organizations should promote different donation frequencies for these donors: higher frequencies for self-oriented donors, and lower frequencies for other-oriented donors. This approach can offer "the best of both worlds": it increases a donor's perceived value from the donation and promotes an increase in the contributions over time.

This study can also help organizations identify donors' underlying motivations to donate based on observed behavioral variables that are readily available from the donor database. We identified a number of variables that are directly related to altruistic motivations to donate, such as giving consent to receive information from the charity, or volunteering. Similarly, we also identified a number of behaviors that are related to selfish motives to donate. These, in our donation context, are linked to tax benefits and, thus, behaviors such as adjustments to the amount donated through extra donations made at specific moments in time (when individuals are preparing their tax declarations) can serve as good indicators of the more extrinsic (or selfish) motivations that drive some individuals to donate. Using these variables can help organizations better gauge the underlying motivations of regular donors to contribute to charity, and thus to develop marketing activities in a more targeted way.

An important finding from this study is that individuals tend to choose those donation frequencies that maximize their perceived value. Notably, our study demonstrates that marketing strategies in the form of presenting donation options during donor registration can alter these effects: for self-oriented donors the presence of donation options reinforces their tendency to choose higher frequencies, but for other-oriented donors the presence of options diverts them from their propensity to choose lower frequencies. While this can erode perceived value for these donors and have a damaging impact on future contributions, organizations can derive short-term benefits if, for example, they need to attend to urgent social problems. The bottom line is that this marketing activity, if implemented appropriately, can contribute jointly both to the well-being of the donors, by increasing the perceived value, and to the well-being of the recipients of the aid. As our study shows, marketing can, therefore, play an important role in creating societal value.

Finally, from a financial perspective, this study can also have important implications for charities regarding the availability of funding and its timing, which determines the *whether* and the *when* organizations can execute their social projects. Each of the different payment schedules (yearly, bi-yearly, quarterly, monthly, etc.) results in differences in the timing and the amount of funding that is available during the year. For example, with a donor registering in time T_1 at the organization and providing a contribution of \$120 in a year, the amount of money available for the organization over time would be different depending on the frequency chosen by the individual to provide her contribution. The organization would have all the money (i.e., \$120) available in T_1 if the donor chooses a yearly frequency, but only \$10 in T_1 (\$20 in T_2, \$30 in T_3, and so on) if she chooses a monthly frequency. The social problems that organizations address are very diverse, ranging from long-term problems including poverty, education, and employment to short-term problems that need urgent interventions, such as those caused by natural disasters or other reasons (e.g., the COVID-19 pandemic). The ability of charitable organizations to respond to all situations critically depends on the availability of funding. The present study provides charities an understanding of the drivers of the choice of frequency by regular donors, which can be used to predict the availability of funding at any time during the year and also to develop strategies aimed at encouraging individuals to choose specific donation frequencies that can be more beneficial for the organization from a financial perspective.

Limitations and Further Research

This study is subject to a number of limitations, which offer the opportunity to expand knowledge in several ways. First, the focus is on a single charitable organization and its regular donor portfolio. While in spirit this is similar to other charitable organizations, differences may be present in the specific causes supported. Similarly, the donors in our study may have had different characteristics compared to those of other charities (e.g., sociodemographic characteristics, cultural traits). More research is needed to determine whether the findings from this study can be generalized to other charitable organizations and even to other types of nonprofit organizations that do not have a

focus on helping disadvantaged groups in society (e.g., museums and sport organizations).

Second, this research relies on behavioral data to identify empirically self- and other-oriented motivations. Although we have demonstrated that the selected variables are good instruments to identify the underlying motivations to donate, other behaviors that are easily identifiable and accessible to the organization could be considered. With the increasing availability of big data (e.g., text- or image-based data), firms may also consider applying techniques (e.g., Natural Language Processing) to infer a donor's motivations from these new data sources. Also, though more costly, and only applicable to a subset of the donor base, firms can survey their donors and use perceptual information that more accurately captures the underlying reasons why donors make contributions to charity. Related to this, while our study looked at the independent role of the two motivations (self- and other-oriented), future research could investigate the relationships between them, and the extent to which donor behavior depends on the relative strength of the two motivations and their interaction.

Third, while we focused on the motivations to donate, looking at other moderating factors can help broaden our understanding of temporal reframing effects. Future studies can investigate proximal factors in modulating the temporal framing effects, such as a donor's disposable income, paycheck frequency, or frequency of donations made to other organizations, or the preference of the charitable organization for immediate versus delayed payment schedules. Also, while this study discusses the implications of the payment schedule on perceived costs and benefits separately, further research could study the cost-benefit trade off process by analyzing the influence of costs on benefits and vice versa. A reduction in perceived costs could lead to a greater warm glow and thus to an increase in perceived benefit for self-oriented motivated people.

Finally, given our focus on the frequency of donation, we investigate regular donors who provide stable funding (i.e., every year) to charitable organizations. However, occasional donors—those who donate sporadically to the organization and do not follow a fixed pattern in their contributions—represent an important source of income for charities as well. Given that these two groups of donors present important differences (e.g., in their commitment to the organization or in their sustained support; Sargeant and Lee 2004), investigating potential differences in the way they donate or respond to marketing activities represents an important area for future research. Similarly, additional evidence can be provided with respect to the donation behavior of major donors—contributors that provide large sums of money—in an attempt to present a wider picture of the different sources of funding for charities, their dynamic evolution over time, and their (potentially different) drivers.

Author contributions

The authors contributed equally in this project, their names appear in alphabetical order.

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Supplemental Material

Supplemental material for this article is available online.

Notes

1. From the original sample, only six regular donors provided their contributions every two (4 donors) and four (2 donors) months, representing 0.001% of the regular donor database.
2. We clarify that donation options are not a necessary condition for individuals to donate with different frequencies. All donors, irrespective of whether they are shown donation options or not, decide their donation frequencies at member registration, but some are shown some pre-defined options.
3. We also estimated our models by considering the donation frequency as an endogenous variable (see Findings section and Web Appendix B for details). We found the core results of the model to be substantially consistent with the results of the more parsimonious proposed model.
4. As a robustness check (see Findings section and Web Appendix C for details), we also investigated alternative model specifications, including an ordered logistic regression. In general, the results are consistent with the main findings of the study.

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