Nudging Art Lovers to Donate

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Abstract

Many nonprofit organizations face revenue uncertainty due to funding cuts. It is crucial for them to supplement existing revenue streams by private donations, and apply thoughtful market segmentation in their pursuit of donors. We introduce the behavioral concept of 'nudge' based on the possibility of loss aversion affecting willingness-to-donate, and investigate its implications for fundraising strategies. Potential donors are nudged to donate by the hypothetical scenario of 'losing' an existing exhibition, and also by that of 'gaining' an additional exhibition. We observe significant loss aversion effects as frequent gallery-goers donate more in order to avoid losing an exhibition. While both prospective gain and loss scenarios are effective in nudging non-frequent gallery-goers, the prospect of enjoying 'one more' event is observed to be stronger. We argue that there may be scope to increase support for nonprofit organizations, particularly in the cultural sector, by exploiting the psychological characteristics of prospective donors.

Introduction

Nonprofit arts organizations worldwide face revenue uncertainty which challenges their ability to deliver goods and services effectively (Hager, 2001). Although funding models vary according to national policy, arts organizations generally rely on various income sources including public funding, private sponsorship, sales and donations. In the USA, federal arts policy tends to favor the delegation of specific funding actions to private donors and arts professionals (Lewis and Brooks, 2005). In the UK, private investment, including individual giving, together with income from trusts, charitable foundations, and business investment, only accounts for 12% of total arts funding, while national and local government funding accounts for 51.5%, with the remaining 36.5% being earned income (Arts & Business, 2012). Despite UK nonprofit arts organizations being heavily dependent on government funding, there has long been pressure to increase income from other sources given ongoing reduction in arts funding (Towse, 1994). Hansmann (1981) argues that arts organizations may have to engage in price discrimination in order to survive without public funding but that achieving this by ticket pricing may be challenging. Organizations which elicit donations from ticket purchasers, however, are effectively able to apply voluntary price discrimination; this may facilitate their survival in challenging times.

The need for fundraising by nonprofit organizations is not new and identifying effective ways to maximize private donations is challenging. Focusing on the detail of fund raising strategy, Kotler and Scheff (1997) argue that an understanding of market segmentation, e.g. differing donor interests, attitudes, and motivation, is essential to the creation of effective messages. Bennett (2003) emphasizes the connection between donors' personal values and those of the organization itself. As well as highlighting the importance of financial and socio-demographic background and of tax benefits to potential donors, he also identifies the importance of psychological antecedents, including empathetic predisposition,

self-esteem, compassion and sense of social responsibility, and individual personality traits, in influencing willingness-to-donate. Additionally, for arts organizations, factors such as emotional response or aesthetic appeal (Guest, 2002) are likely to be important influences.

Given the potential significance of such psychological or emotional factors, the behavioral economics concept of 'Nudge' may be particularly relevant to the creation of communication messages designed to increase the level of donations to nonprofit organizations. Behavioral economic theory, unlike neo-classical theory based on rational utility maximization, assumes that individuals are prone to bias, emotional, myopic, easily confused and distracted (Ariely, 2010; Kahneman and Tversky, 2000; Kahneman, 2011). Behavioral economists believe that, by utilizing such personality flaws, individuals may be 'nudged' to enhance the quality of their decision-making (Slovic, 1995; Hausman and Welch, 2010).

In this paper, we investigate how 'Nudge' might be applied by a major visual arts gallery located in Scotland in order to increase private donations to a specific art exhibition. While existing research (e.g. Bertacchini et al., 2011; Kim and Van Ryzin, 2014) provides empirical evidence on willingness-to-donate to cultural organizations, as the first paper to introduce 'Nudge' together with the loss aversion effect of Prospect Theory (Kahneman and Tversky, 1979) within such a context, our work is innovative and has significant policy implications. O'Brien (2010) stresses that there is a lack of contingent valuation studies on arts and cultural organizations, and we believe that our study makes a significant contribution to filling this gap and to widening perspectives on public policy, business strategies, and fundraising for nonprofit organizations. We discuss the concept of 'Nudge' in more detail in the following section together with its application to the contingent valuation method (see e.g. Noonan, 2003) often used to elicit individual preferences.

Incorporating 'Nudge' in the Contingent Valuation Method

'Nudge' summarizes the central idea underpinning any aspect of the choice architecture which aims to influence individuals in predictable ways by simple and cheap-to-run interventions while retaining individuals' freedom to choose options without significantly changing their economic incentives (Thaler and Sunstein, 2009). Interventions such as default options, personalization, salience and framing have been applied in various domains including health and well-being (Johnson and Goldstein, 2003), tax compliance (Bhargava and Manoli, 2013) and charitable giving (Behavioural Insights Team, 2013). A well-known example is the 'Save More Tomorrow' initiative of Thaler and Benartzi (2004), a prescriptive savings program which encourages employees to increase their rate of saving on receipt of a pay rise while reserving to them the ability to 'opt-out'.

'Nudge' enables accounting for the psychological flaws of individuals within the contingent valuation method (CVM). CVM is predicated on the assumption that individuals' revealed values are contingent upon hypothetical scenarios included in experiment-based surveys designed to elicit preferences in monetary terms for changes in the quantity or quality of non-market goods or services (Portney, 1994). CVM has been used to value public goods and environmental amenities (Hanemann, 1994; Carson et al., 1994), and since the seminal study of Throsby and Withers (1983), has become popular in arts and culture (Noonan, 2003; Martin, 1994). Examples include studies on the Royal Theatre, Copenhagen (Hansen, 1997), the British Museum (Jaffry and Apostolakis, 2011) and the Museum of Central Finland (Tohmo, 2004).

In contrast to our application, CVM in its 'traditional' form assumes that individuals' coherent and rational preferences enable them to be the 'best' judges of their welfare. Dolan and Metcalfe (2008), however, claim that a pervasive problem arises from the unrealistic assumptions which underpin the neo-classical economic paradigm. Sugden (2005) highlights

a number of anomalies apparent in individuals' stated preferences exemplifying systematic deviations from the predictions of neo-classical economics. A well-known anomaly is the disparity between willingness-to-accept and willingness-to-pay when transacting goods or services (Plott and Zeiler, 2005). Knetsch and Sinden (1984) and Coursey, Hovis and Schulze (1987) account for this by the loss aversion effect (Kahneman and Tversky, 1979) which assumes that individuals are more sensitive to losses than to gains, and that prospective losses influence individuals by at least twice as much as do gains of the same magnitude. This paper is predicated on the assumption that loss aversion affects willingness-to-donate and we investigate the implications for nonprofit organizations' fundraising strategies.

Based on their identification of the factors motivating arts donations in Kentucky, Thompson et al. (2002) stress the benefits of incorporating different scenarios within a survey on the provision of arts events. They find that households are willing to donate more under scenarios eliciting donations to avoid a 25% reduction in the current number of art programs due to funding cuts, than they are under scenarios positing an increase in the number of art programs by 25%. Although Thompson et al. (2002) do not emphasize psychological effects; their conclusions reflect the loss aversion effect (Kahneman and Tversky, 1979).

We build on the work of Thompson et al. (2002), by specifically applying the 'nudge' concept in order to identify the effectiveness of alternative fundraising strategies. Our study is carried out with the cooperation of the Royal Scottish Academy in Edinburgh, Scotland, UK (hereafter 'the gallery'). The gallery is an independent, privately-funded charitable organization led by eminent Scottish artists and architects, which receives no government funding. For the year ending 30 November 2012, the gallery reports total annual income of £489,586. About 50% (£226,835) is generated from its portfolio of listed investments (market value £6.8m). About 25% (£125,289) derives from its rolling program of exhibitions, in the form of sales commission, admission and sponsorship. Awards, donations and legacies

(£42,605) account for 8.7% of income. Sales of paintings, drawings and furniture, picture rental and grants account for the remainder. The gallery has recently experienced disappointing investment returns. If current economic circumstances persist, private donations will assume greater importance as an element of recurring revenue.

With a mission to promote and support the visual arts, the gallery offers an all-year program of charged and free-entry exhibitions, in addition to residencies, scholarships and awards for artists and architects. Since 1976 the gallery has provided a platform for recent Scottish art college graduates to showcase their talents through the annual *New Contemporaries Exhibition* (hereafter 'the exhibition'). There are limited opportunities for graduating artists to engage with public audiences; the exhibition constitutes one such platform (Fillis, Lee and Fraser, 2015). While other exhibitions showcase the artworks of recent graduates in Scotland, the exhibition remains the largest such platform in terms of artist numbers and gallery capacity.

In 2014, the exhibition attracted over 7,000 visitors, and over 300 purchasable artworks were exhibited including installation works, oil paintings, watercolors, drawings, prints, sculpture, performance and architecture, by 64 artists, approximately 1 in 7 of the graduating students eligible, selected from each of the five art colleges and five architectural schools located in Scotland. We carry out a survey of visitors to the exhibition following the argument of Hansmann (1981) that donors who are also ticket buyers are effectively engaging in price discrimination voluntarily, i.e. they willingly pay more than is required. We believe that those who love art, and who are already present at the research site, are easier to 'nudge'. Thus our research hypothesis is applied only to exhibition visitors as described below.

Research Hypothesis

According to prospect theory (Kahneman and Tversky, 1979), the value function for individuals is defined by an S-shaped graph with a kink at the origin, indicating that

individuals are conscious of even marginal changes to their prospects. Individuals perceive their prospects in terms of *Gains* and *Losses* defined relative to a reference point, the *Status Quo* (Tversky and Kahneman, 1991). The model is identified as concave for gains and convex for losses, and displays diminishing sensitivity in both directions as the magnitude of gains and losses increases. The slope for losses is about twice as steep as that for gains. This difference is a reflection of individuals' loss aversion, suggesting that the pain experienced as a result of losing a given amount is more than twice the pleasure produced by gaining the same amount.

To test the loss aversion effect, we create three different versions of a question on visitors' willingness-to-donate; two of the three versions incorporate hypothetical prospective scenarios. Firstly, the 'Unframed' version asks the question in the following form. *"This exhibition is the only exhibition showcasing the artworks of Scotland's emerging talent. Supposing that the gallery was raising funds for the exhibition, how much would you be willing to donate?"* This version of the question represents the current utility position of visitors and those who answer it are allocated to a control group.

Secondly, the 'Gain-framed' version changes the second sentence as follows: *"Supposing that the gallery is raising funds to provide another platform similar to the exhibition for emerging artists within Scotland, how much would you be willing to donate?"* Visitors allocated to this treatment group have the potential to move their utility from the *Status Quo* to the *Domain of Gain*. The question seeks to elicit visitors' willingness-to-donate in order to enjoy 'one more' similar event.

Thirdly, the 'Loss-framed' question changes the second sentence as follows: *"Supposing that the gallery was in a position where it had to discontinue the exhibition because of financial constraints, how much would you be willing to donate in order for the gallery to be able to continue with the exhibition?"* The question is administered to a second

treatment group, creating the potential for visitors to move their utility from the *Status Quo* to the *Domain of Loss* through the hypothetical scenario of raising funds in order to prevent an outcome whereby there is no platform available for consumption; in effect this would mean that the exhibition itself is 'lost'.

The three versions of the question allow us to test whether the difference in willingness-to-donate stems from diminishing marginal utility of consumption; intuitively, there may be considerable benefit accruing from the first exhibition, but a second may be less beneficial. There is a single utility function indicating diminishing marginal utility with an additional exhibition, while there is a 'kink' in the function reflecting the impact of reducing the number of similar exhibitions from one to zero. In accordance with the loss aversion effect, we expect the scenario which postulates losing the exhibition to give rise to the highest willingness-to-donate. Thus we hypothesize that *the average willingness-to-donate is highest for the loss-framed version, followed by the gain-framed, with the unframed version last.*

If we observe greater willingness-to-donate by visitors allocated to the loss-framed version than to the others, this might provide a useful perspective, in terms of the potential effects of 'nudge', to gallery managers responsible for fundraising strategies. Nonetheless, the magnitude of the loss aversion effect may also be dependent on the level of interest which individual visitors have in visual art. Using 'the frequency of exhibition visits' as a proxy for the degree to which visitors are interested in visual art, we examine whether the loss aversion effect differs between frequent and non-frequent gallery-goers.

Survey Construction

Since the 1850 Public Libraries and Museums Act which permits free entry to museums and libraries, the UK public have become familiar with free access to cultural sites, taking the resultant benefits 'for granted' (Bailey and Falconer, 1998). As the gallery receives no governmental funding, entrance fees constitute one of its critical income sources. The

exhibition was ticketed (£4 standard, £2 concession), while gallery membership holders enjoy free admission along with a guest. Membership subscriptions cost between £20 and £150 annually. Due, however, to its location adjoining the publicly funded National Gallery of Scotland, which offers free admission, the gallery's funding status is often misunderstood. According to the 'crowding-out' hypothesis, government funding displaces or discourages private giving while the 'crowding-in' hypothesis claims the opposite (Schiff, 1990; Khanna and Sandler, 2000; Smith, 2003); such misunderstanding may cause adverse consequences in terms of falling donations (Abrams and Schmitz, 1984; Dokko, 2009). There is no consensus on crowding-out (in) effects, although many studies have investigated these complex phenomena (Brooks, 2000; Okten and Weisbrod, 2000; Andreoni and Payne, 2003; 2011; Kim and Van Ryzin, 2014). Horne, Johnson, and Van Slyke (2005), however, argue that they are more problematic when donors lack knowledge concerning the existence and levels of government funding. Thus we elicit visitors' perceptions of the entry price by informing only 50% of our respondents as to the funding status of the gallery in order to identify the effect on the respective amount which each group is willing to donate.

We create two versions of the survey question eliciting visitors' perceptions as to the entry price charged, 'Uninformed' and 'Informed', in order to account for the information effect in respect of funding status on willingness-to-donate. Survey respondents have options of 'Too little', 'About right', and 'Too much' respectively from which to select their response. The 'Uninformed' control group receives the question in the following form. *"What is your opinion of the entry fee charged?"* The 'Informed' treatment group receives the question incorporating additional information as follows: *"This gallery is an independent, privately-funded institution not receiving any core local or central government funding. What is your opinion of the entry fee charged?"*

The question eliciting perceptions of the entry fee was positioned within the survey immediately prior to that concerning visitors' willingness-to-donate. Thus responses to the willingness-to-donate question may be confounded by survey respondents' prior exposure to the question on entry fee. In order to disentangle the effect of these two interventions, we create six survey versions and distribute these randomly to visitors. Figure 1 presents our visitor allocations for the six versions of the survey based upon our experimental design and the number of individuals allocated to each version.

[Figure 1 here]

Other Determinants of Willingness-to-Donate

We conduct our survey on-site at the gallery, thus our sampling frame includes exhibition visitors only. A total of 675 visitors were surveyed; of those, 54 who did not provide responses to the most questions on socio-demographic backgrounds are excluded from our analysis, while we incorporate a 'not available' category to retain observations for those who did not answer the questions regarding gender, education level or household income. Thus our final sample size is 621. In Table 1, we present responses to a set of socio-demographic questions included in the survey.

[Table 1 here]

We observe that 26.3% of respondents visit art exhibitions more than once a month; 20.5% visit about once a month, 22.1% visit between 5 to 8 times a year; 18.8% visit between 1 to 4 times a year; 8.1% visit less than once a year; and for 4.4%, this was their first visit to an art exhibition. We classify those visitors who visit art exhibitions more than once a month as 'frequent gallery-goers' and the remainder as 'non-frequent gallery-goers'. When asked as to their perceptions of the entry fee charged, 86.8% of visitors indicate that it is 'about right', 7.4% state it is 'too little' and 5.8% that it is 'too much'.

With regards to visitors' socio-demographic backgrounds, we observe that these are evenly balanced in terms of gender. The majority of visitors are of age group 18 to 34 (52.2%) reflecting an apparently high interest among younger individuals. Many visitors have art-related occupations with 40.9% being art college students, artists, or employees of cultural institutions. The majority of respondents have either an undergraduate (39.6%) or postgraduate degree (21.4%). About 23.2% report gross annual household income of less than £10,000, reflecting a relatively high proportion of students and younger artists. We also observe that about 4.5% report gross annual household income in excess of £100,000.

Measures of economic valuation based solely on CVM may not fully encapsulate the exhibition's multidimensional features (Hutter and Throsby, 2008). Following Bakhshi and Throsby (2010), we test the proposition that economic valuations are influenced by experienced cultural and social values, i.e. the greater is visitors' cultural enjoyment of the exhibition, the more likely they are to donate (Throsby, 2001; 2003). The statement "*I felt an emotional connection with the artworks."* relates to the aesthetic, emotional and other 'connections' with the artworks experienced by visitors. If the exhibition has an emotional impact on visitors, we expect them to feel moved, excited, or affected (Guest, 2002; Locher, 2014). Thus the responses to this question provide information on important aspects of the cultural value created for visitors. Societal dialogues are known to maximize the impact of experience (Bakhshi and Throsby, 2010). We sought to identify whether visitors found discussing and conversing about the exhibition or the artworks with others to be an enjoyable experience, by presenting them with the statement "*Talking about the artworks with other people was enjoyable*" (Newman and McLean, 2004; Potts et al., 2008). Visitors were asked for their level of (dis)agreement with these two statements, which we define as 'Cultural value' and 'Social value' respectively, based on a 5 point Likert scale (1-'Not at all' and 5 - 'Very much'). We present the proportions of visitors responding on each scale point in Table

1. We include these measures as dummy variables in our multivariate regression tests as determinants of visitors' willingness-to-donate by classifying those visitors who respond at above point 3 on the scale, i.e. those who either 'agree' or 'very much agree', following the approach of Terza (1987).

Empirical Approaches

Univariate test results

As shown in Panel A of Table 2, 323 visitors, approximately half our sample (621 visitors), completed the willingness-to-donate question. The reported values range from £0 to £100 after winsorization at the 95th percentile with a high concentration of zero values (43 observations, 13%). The mean is £12.04; although the median of £5 indicates that values are positively skewed.

[Table 2 here]

Descriptive statistics, *p-values* for a two-tailed *t-test* on the mean and a *Mann-Whitney test* on the median values for differences between the respective groups, 'Unframed', 'Gain-framed', and 'Loss-framed', are compared as shown in Panel B of Table 2. Those visitors allocated to the 'Gain-framed' version exhibit the highest mean of £15.08; those allocated to the 'Loss-framed' version the next highest of £12.23 while those allocated to the 'Unframed' version exhibit the lowest mean of £8.74. We observe statistically significant differences only when we compare the responses, in terms of mean values, for the 'Unframed' versions with those for the 'Gain-framed' (at the 5% level) and 'Loss-framed' versions (at the 10% level), respectively. No statistically significant differences are observed for mean values between the 'Gain-framed', and 'Loss-framed' versions in terms of responses by all visitors.

We also present descriptive statistics and univariate test results for frequent gallery-goers separately in Panel C of Table 2. The values reported for both 'Unframed' and 'Gain-framed' versions are similar, with mean values of £11.66 and £11.43, respectively. Those

allocated to the 'Loss-framed' version indicate a much higher mean of £16.06. We do not, however, identify any statistically significant differences between the three versions which may be due to small subsample sizes. To test our hypothesis regarding the loss aversion effect, we undertake a multivariate regression on visitors' willingness-to-donate.

Multivariate Analysis

In our multivariate regression model, the dependent variable is visitors' willingness-to-donate, (measured in £s), based on the responses of the 323 visitors, including those indicating a 'zero' donation, who answered the willingness-to-donate question. As an explanatory variable, we create a categorical dummy variable by interacting the three versions, 'Unframed', 'Gain-framed' and 'Loss-framed', developed to account for the loss aversion effect, with a dummy variable identifying frequent gallery-goers. The group of non-frequent gallery-goers allocated to the 'Unframed' version is omitted as a reference category for comparison.

We control for visitors' perceptions as to the current exhibition entry price charged; i.e. whether it was 'Too little', 'About right' or 'Too much', while also taking account of the gallery funding status intervention which classifies survey respondents as either 'Uninformed' or 'Informed' by interacting two variables. Those who do not receive any funding status information, i.e. 'Uninformed', and perceive the entry fee as 'too little', are omitted from the regression for reference. We also control for the experienced values identified as 'Cultural' and 'Social' as well as the socio-economic backgrounds of visitors including their gender, occupation, education and level of household income. We exclude the age variable from our model due to its high correlation with the occupation variable, especially with the 'retired' category.

Our dependent variable remains skewed after omitting missing data with a high concentration at zero and a few observations exhibiting high donations. This violates the

normality assumption of ordinary least squares, given the high probability that the error term is also skewed. We therefore use the Poisson pseudo-maximum-likelihood (PPML) estimator, as proposed by Silva and Tenreyro (2006), as an alternative method of accounting for zero values. This estimator gives consistent results regardless of the data distribution, and is valid with general forms of heteroskedasticity. Additionally, PPML gives consistent results when there are many dummy variables despite it being a nonlinear maximum-likelihood estimator.

[Table 3 here]

As shown in Table 3, we present the marginal effects of the PPML estimation on willingness-to-donate. We observe that non-frequent gallery-goers allocated to both 'Gain-framed' and 'Loss-framed' versions are willing to donate significantly more than those allocated to the 'Unframed' version (the reference category). Those allocated to the 'Gain-framed' version exhibit willingness-to-donate of about £10 more, and those allocated to the 'Loss-framed' version about £5.50 more, than those allocated to the 'Unframed' version; these two effects are significant at the 1% and 5% levels, respectively. Thus the exhibition may have triggered a desire for more cultural events on the part of those who had been less exposed to these previously in that they appear to value the prospect of enjoying 'one more' event similar to the exhibition more than they do the prospect of losing the current exhibition. We observe a significant loss aversion effect exhibited by frequent gallery-goers. Frequent gallery-goers exposed to the loss-framed scenario, under which the gallery is in the position of having to discontinue the exhibition because of financial constraints, are willing to donate about £9 more than the reference category at the 5% significance level supporting our hypothesis.

The effects of perceptions as to the entry price charged, on visitors' willingness-to-donate are significant when these perceptions are compared to those allocated to the reference category, who are uninformed about the gallery's funding status and who perceive the entry price charged as 'Too little'. According to Wald tests (not reported), those who

perceive the price charged as either 'About right' or 'Too much' exhibit significantly lower willingness-to-donate than those perceiving the price charged as 'Too little'. These results are regardless of the gallery funding status information provision. Those visitors informed of the gallery's funding status do not exhibit greater willingness-to-donate than those uninformed. Additionally, the information effect regarding gallery funding status has no significant influence on visitors' perceptions of entry price.

We also observe significant influences deriving from visitors' socio-demographic backgrounds. In the case of those allocated to the reference category, those who are art college students, artists and retired, exhibit significantly higher willingness-to-donate than do students. Similarly for the reference category, those with college diplomas or undergraduate or postgraduate degrees exhibit higher willingness-to-donate than those whose highest level of education is secondary school. Finally, those with higher household incomes, between £41,000 and £100,000, exhibit significantly higher willingness-to-donate than those with household incomes of less than £10,000 for the reference category. These significant effects, especially for visitors' occupations, incomes and education levels, support previous literature on determinants of donor behavior. The identified differences in willingness-to-donate highlights the potential scope for thoughtful market segmentation of non-profit organizations when seeking to maximize donation income.

Robustness Checks

Due to the nature of stated preference techniques and the consequent necessity for the interrogation to be relatively complex, e.g. the use of open-ended questioning, almost 50% of survey participants left the willingness-to-donate question unanswered. Visitors may be unfamiliar with, or lack experience or time in, the specific case setting when formulating their preferences (Bedate, Herrero and Sanz, 2009). Although missing data are a common feature of CVM, we do not know whether they occur randomly in this case or whether, alternatively,

those visitors who decline to answer the willingness-to-donate question share certain characteristics, such as low income or education levels, thus making them less likely to donate. If non-responses reflect adverse reaction to the question, omission of the missing observations may lead to sample selection bias and to average values computed being overstated.

In order to check for non-response bias, i.e. whether non-respondents share systematically different characteristics, we use the Heckman selection model (Heckman, 1979) to execute our robustness checks. The Heckman regression outcome model is constructed in the same manner as the PPML model. In our selection equation, the dependent variable takes a value of 1 for visitors who answer the question, including those indicating zero as well as positive willingness-to-donate values; and 0 otherwise, i.e. for missing values. Based on the total of 621 observations, this two-stage regression model not only accounts for the decisions of visitors on how much to donate but also their willingness to answer the question.

We include an additional variable in the selection model as an instrument which may determine visitors' decision to answer the willingness-to-donate question, but not the amount they are willing to donate. We believe that visitors' familiarity with the gallery, as a result, for example, of prior visits or knowledge of its operations (Hansmann, 1981), may influence their willingness-to-donate. Thus the question asks "*Have you visited previous Royal Scottish Academy New Contemporaries Exhibitions*?", and based on the 46.9% of respondents indicating 'Yes' and the 53.1% indicating 'No', we construct a dummy variable which is included in the selection in order to meet the exclusion restriction. In Table 4, we report the marginal effects of the maximum likelihood estimates of two equations where the selection and outcome equations are estimated simultaneously.

[Table 4 here]

In Panel A of Table 4, we report the outcome regression results. We observe results which are comparable to our PPML estimates, although at reduced levels of significance. In

terms of our research hypothesis, we still observe significant effects from the gain-framed scenario for non-frequent gallery-goers (at the 1% level) and the loss-framed scenario for frequent gallery-goers (at the 10% level) on their willingness-to-donate. Non-frequent gallery-goers allocated to the gain-framed scenario are willing to donate £8.69 more than those allocated to the unframed scenario. The prospect of non-frequent gallery-goers enjoying 'one more' event similar to the exhibition has greater value for them than losing the exhibition. For frequent gallery-goers, however, the loss-framed message remains powerful. These results again underline that employing the loss aversion effect may not work in the same way for all individuals.

In Panel B of Table 4, we present the marginal effects from the Probit selection model, where we identify the characteristics of those who chose to answer the willingness-to-donate question, i.e. 323 uncensored observations, compared to those who did not, i.e. 298 censored observations. We observe that those who have not previously visited the exhibition are about 12% less likely (significant at the 1% level) to respond to the willingness-to-donate question than those who have. The 'Social value' variable is significantly correlated with the probability of responding to the willingness-to-donate question. Those visitors who have enjoyed interactions with others during their visit are more likely to respond to the question than those who did not (at the 5% significance level), stressing the importance of the group experience. Art college students are about 14% more likely (at the 10% level) to answer the willingness-to-donate question while respondents designated as 'others' in terms of occupation are 43.5% less likely (at the 1% level) to do so than those who are students in general. Compared to those with household incomes of less than £10,000, those with household incomes in the categories of '£10,000 to £20,000' and '£61,000 to £100,000' exhibit significantly higher probabilities (13.6% and 14.4%, respectively) of responding to the question, while those who choose the 'Not Available' category exhibit less probability (14%) of doing so. Once again, occupations,

incomes and education levels are significant in determining whether or not visitors complete the willingness-to-donate question. Those who choose not to disclose their occupation or household income are less likely to answer the donation question, which may indicate either their lack of interest in completing the survey or their financial difficulties.

After estimating the Heckman selection model, we obtain a Likelihood-Ratio (LR) test result of independent equations. With regard to the relationship between the outcome and selection equations, the test fails to reject the null hypothesis confirming that the two error terms are uncorrelated, i.e. there is no serious sample selection issue. We do not argue that the Heckman model is superior to the PPML estimator as each has particular advantages and disadvantages. The PPML estimator, however, is consistent with the existence of heteroskedasticity, while the Heckman model is not. Consequently, we present results for both approaches in testing the robustness of our results.

Although our empirical analysis is grounded in our underlying theoretical assumptions, our findings should be interpreted with caution. We acknowledge that our study is subject to small sample size bias as well as other biases affecting survey based studies, e.g. self-selection. In particular, our visitor sample is heavily skewed towards a younger demographic with a lower than average income level, less life experience, and, possibly, less self-awareness of their preferences. These characteristics may affect their responses to the nudge points set for this study.

Discussion and Implications

Many nonprofit organizations worldwide are required to sustain service delivery within an environment characterized by significant revenue constraints. The Royal Scottish Academy is one such organization, presenting the New Contemporaries exhibition in order to support emerging artists and maintain its charitable mission grounded in the organization's history, belief, governance, and culture. Weisbrod (1977) views nonprofit organizations as private

producers of public goods. The gallery attempts to meet the needs of recent art college graduates and other stakeholders by providing a sole platform which is not subsidized by national or local government. In response to the uncertainty regarding the gallery's recurring income as a result of austerity and economic downturn, we employ the 'nudge' concept as an innovative vehicle with a view to identifying possible methods of enhancing the level of private donations.

Exploiting the psychological concept of loss aversion as explicated in prospect theory (Kahneman and Tversky, 1979), we hypothesize that visitors allocated to a loss-framed scenario exhibit greater willingness-to-donate to the exhibition than those allocated to both gain-framed and unframed scenarios. We accept our hypothesis for part of our sample. We observe that frequent gallery-goers, those who visit art galleries more often than once a month, exhibit significantly greater willingness-to-donate when they are allocated to the loss-framed scenario than when allocated to the two other scenarios. These findings are significant after controlling for experienced cultural and social values as determined by the subjective experiences of the exhibition and the socio-economic characteristics of visitors. Our findings support Coursey, Hovis and Schulze (1987) who find that loss aversion has serious implications for welfare economics and the valuation of public goods, despite those not being traded in the market. Kahneman and Knetsch (1992) also argue that contributions to, or 'purchase of', public goods are strongly related to moral satisfaction.

We also find that both gain- and loss-framed scenarios are effective when presented as 'nudges' to the non-frequent gallery-goers who constitute the majority of exhibition visitors, although the gain-framed scenario appears to be more effective than the loss-framed scenario. Throsby (2003) classifies cultural goods as experiential or addictive, arguing that demand is cumulative rather than diminishing over time. Thus may influence the economic valuations of non-frequent gallery visitors. It may be that the value of cultural experiences to them is

conceptually different to more general utility changes. They appear to never value the prospect of additional cultural experiences as a declining variable; the value created may be sustainable at a given level without diminishing. This may explain why, for non-frequent gallery-goers, the pleasure obtained from one more event similar to the exhibition is valued as much as the disappointment of losing the exhibition. Thus the validity of the loss aversion effect in given situations may be dependent upon both the nature of the goods or services applied and the personal characteristics of the consumer; this may point to another 'blind spot' within prospect theory in addition to those which have been already acknowledged (see e.g. Kahneman, 2011).

We note that the employment of 'wolf-at-the-door' fundraising strategies based on loss-framed scenarios, similar to the one in this study, may carry risk. If the proposed reduction in programming is hypothetical, it may only be possible to signal 'mortal danger' once; multiple false alarms risk forfeiting the trust of donors. Unless the organization seriously intends to actually reduce programming based on the reaction of donors, threatening reduced activity levels is likely to be viewed as unethical. Increases or decreases in programming should be grounded in an overall long-term strategy; such a strategy requires incorporating multiple managerial concerns in addition to income diversification. For example, galleries generally, have artistic, educational, community, curatorial, and stewardship roles to fulfill. Thus we recognize that the practical implications arising from our research should be implemented cautiously.

Both the principles and findings of our research are of interest to other arts and cultural institutions, their funders and other nonprofits, particularly given government-induced and austerity-led funding constraints in the UK and worldwide. At the same time, these constraints are juxtaposed with pressures on cultural organizations resulting from government policies aimed at widening cultural participation.

We acknowledge that nonprofit art organizations face other strategic management issues which we fail address in this paper. Given existing government policies which seek to widen cultural participation, however, it is crucial to encourage a self-sustainable environment for nonprofit arts and cultural organizations thus enabling them to supplement existing problematic revenue streams. By exploiting the psychological concepts, there is potential to 'nudge' art lovers to contribute more to the cultural economy. Our findings may be used to inform and manipulate the wording of direct and digital marketing communication messages, as well as to help shape the content of advertisements appealing for financial support. These and other 'nudge' ideas such as default options to increase membership levels, the development and introduction of donation games, and the personalization of messages when communicating with future donors are applicable to both arts and other nonprofit organizations. Although most charitable nonprofit organizations may be distinguished from the gallery which is the focus of the present case, by, for example, very different customer profiles, most or all rely on donations to make their operations sustainable and further research might usefully consider whether the findings of the present research might be portable to them.

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Figure 1. Experimental Survey Design

This figure presents our experimental survey design based on two interventions and visitor allocations for each version.

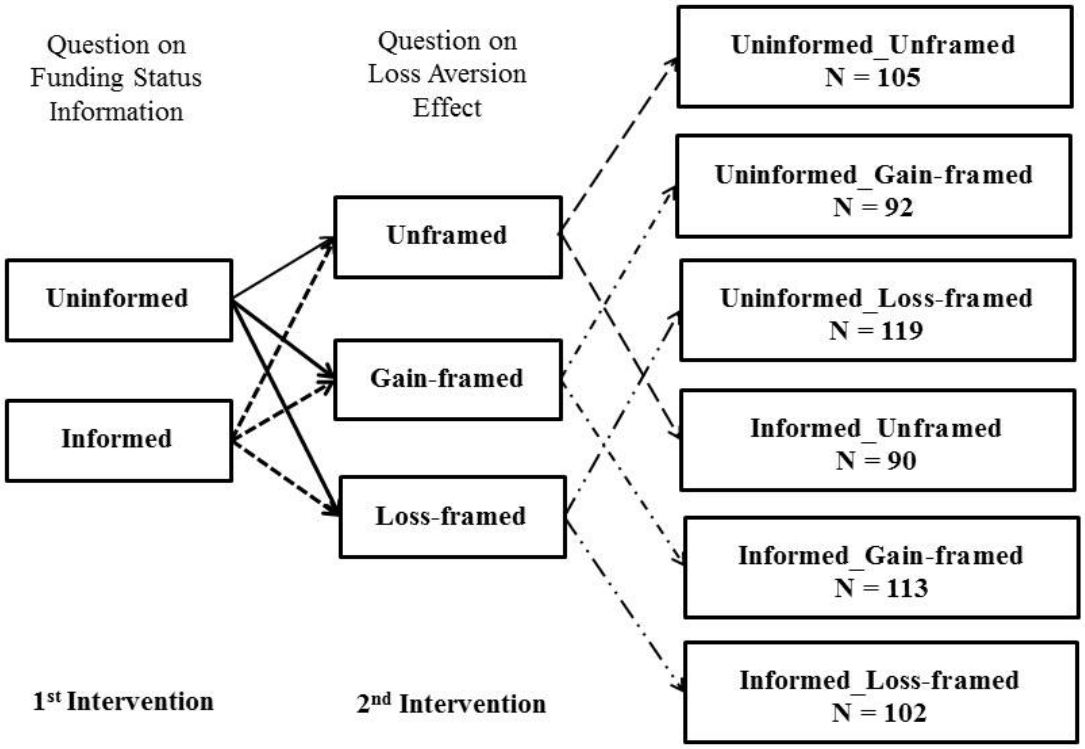

Table 1. Determinants of the Willingness-to-Donate

This table presents survey results and socio-economic background information for 621 participants. The statement which elicits visitors' experiential cultural value is "*I felt an emotional connection with the artworks*" while for social value, it is "*Talking about the artworks with other people was enjoyable*".

Visit to Art Exhibitions	**N**	**%**	**Entry Price Perception**	**N**	**%**
More than once a month	163	26.25%	Too little	46	7.41%
About once a month	127	20.45%	About right	539	86.80%
Between 5-8 times a year	137	22.06%	Too much	36	5.80%
Between 1-4 times a year	117	18.84%	**Gender**	**N**	**%**
Less than once a year	50	8.05%	Male	308	49.60%
This was my first time	27	4.35%	Female	301	48.47%
Age	**N**	**%**	Not Available	12	1.93%
Below 18	10	1.61%	**Education**	**N**	**%**
18-24	170	27.38%	Secondary school	80	12.88%
25-34	154	24.80%	College diploma	56	9.02%
35-44	75	12.08%	University degree	246	39.61%
45-54	86	13.85%	Postgraduate degree	133	21.42%
55-64	76	12.24%	Professional qualification	80	12.88%
65-74	46	7.41%	Technical qualification	18	2.90%
75+	4	0.64%	Not Available	8	1.29%
Occupation	**N**	**%**	**Income**	**N**	**%**
Student	88	14.17%	Less than £10,000	144	23.19%
Art college student	117	18.84%	£10,000 to £20,000	88	14.17%
Artist	104	16.75%	£21,000 to £30,000	75	12.08%
Arts practitioners	33	5.31%	£31,000 to £40,000	69	11.11%
Skilled manual	41	6.60%	£41,000 to £60,000	77	12.40%
Professional	177	28.50%	£61,000 to £100,000	58	9.34%
Retired	49	7.89%	More than £100,000	28	4.51%
Other	12	1.93%	Not Available	82	13.20%
Cultural Value	**N**	**%**	**Social Value**	**N**	**%**
1-Not at all	88	14.17%	1-Not at all	31	4.99%
2	171	27.54%	2	67	10.79%
3	221	35.59%	3	199	32.05%
4	121	19.48%	4	207	33.33%
5-Very much	20	3.22%	5-Very much	117	18.84%

Table 2. Univariate Results on Willingness-to-Donate for the Exhibition

This table presents descriptive statistics including values of mean, median, standard deviation, and the number of observations from visitors' responses on willingness-to-donate. Panel A) describes the sample distribution; Panel B) exhibits the descriptive statistics of the willingness-to-donate responses for all visitors while Panel C) is concerned with frequent gallery-goers only. We also report *p* values from the univariate tests based on a two-tailed t-test and a Mann-Whitney test (statistical significance: ** at the 5%-level, * at the 10%-level).

Panel A) Sample Distribution

Category	Total sample	%	Non-Missing subsample	%
Willingness-to-Donate=.	298	48%		
Willingness-to-Donate=0	43	7%	43	13%
Willingness-to-Donate>0	280	45%	280	87%
Total	**621**	**100%**	**323**	**100%**

Panel B) Willingness-to-Donate by All Respondents

Version	Mean	Median	Mode	S.D	N
All	£12.04	£5	£10	£19.24	323
'Unframed'	£8.74	£5	£10	£12.70	99
'Gain-framed'	£15.08	£5	£5	£25.24	99
'Loss-framed'	£12.23	£8	£10	£17.73	125
Significance test	**t-value**	**p-value**	**Mann-Whitney test**		**p-value**
'Unframed'-'Gain-framed'**	-2.234	0.027	-0.843		0.399
'Unframed'-'Loss-framed'*	-1.728	0.085	-1.552		0.121
'Gain-framed'-'Loss-framed'	0.983	0.327	-0.595		0.551

Panel C) Willingness-to-Donate by Frequent Gallery-Goers

Version	Mean	Median	Mode	S.D	N
All	£13.29	£5	£5	£22.53	86
'Unframed'	£11.66	£5	£10	£19.94	32
'Gain-framed'	£11.43	£5	£5	£23.01	21
'Loss-framed'	£16.06	£10	£10	£24.89	33
Significance test	**t-value**	**p-value**	**Mann-Whitney test**		**p-value**
'Unframed'-'Gain-framed'	0.038	0.970	-0.798		0.425
'Unframed'-'Loss-framed'	-0.786	0.435	-0.761		0.447
'Gain-framed'-'Loss-	-0.686	0.496	-1.286		0.198

Table 3. PPML Estimates for Willingness-to-Donate

This table presents marginal effects of the Poisson pseudo-maximum-likelihood (PPML) estimation results on willingness-to-donate based on 323 observations (statistical significance: *** at the 1%-level, ** at the 5%-level, and * at the 10%-level).

Willingness-to-Donate for the Exhibition_£		**dy/dx**	**z-value**
Non-Frequent Gallery-goers	'Gain-Framed'	10.318***	3.10
	'Loss-Framed'	5.511**	2.06
Frequent Gallery-goers	'Unframed'	6.521	1.50
	'Gain-Framed'	3.682	0.66
	'Loss-Framed'	9.178**	2.17
No-Funding Status	Entry Price 'About right'	-8.351***	-2.71
	Entry Price 'Too much'	-8.643***	-6.62
Funding Status Information	Entry Price 'Too little'	-4.728**	-1.97
	Entry Price 'About right'	-8.868***	-2.64
	Entry Price 'Too much'	-8.653***	-13.11
Experienced Value	Cultural Value	2.382	1.07
	Social Value	0.458	0.27
Gender	Female	0.169	0.10
[ref: Male]	Not Available	-4.620	-1.54
Occupation	Art college student	12.673**	2.43
[ref: Students]	Artist	11.342***	2.64
	Worker for a cultural institution	5.647	1.11
	Skilled manual	-0.285	-0.11
	Professional	1.690	0.68
	Retired	13.257*	1.90
	Other	17.092*	1.79
Education	College diploma	10.560*	1.72
[ref: Secondary school]	University degree	4.679*	1.87
	Postgraduate degree	9.379**	2.29
	Professional qualification	2.724	0.65
	Technical qualification	-1.323	-0.39
	Not Available	11.017*	1.76
Household Income	£10,000 to £20,000	4.415	1.14
[ref: Less than £10,000]	£21,000 to £30,000	-2.984*	-1.78
	£31,000 to £40,000	6.313	1.51
	£41,000 to £60,000	11.904**	2.46
	£61,000 to £100,000	16.012**	2.25
	More than £100,000	13.359	1.58
	Not Available	4.511	1.23
R-squared			**0.25**

Table 4. Heckman Selection Model on Willingness-to-Donate

Panel A) Outcome Regression Results

This table presents the outcome regression results on willingness-to-donate for the Heckman selection model (statistical significance: *** at the 1%-level, ** at the 5%-level, and * at the 10%-level). Based on 621 total observations, there were 298 censored observations and 323 uncensored observations.

Willingness-to-Donate for the Exhibition (in £)		**dy/dx**	**z-value**
Non-Frequent Gallery-goers	'Gain-Framed'	8.690***	2.81
	'Loss-Framed'	4.124	1.35
Frequent Gallery-goers	'Unframed'	3.977	1.00
	'Gain-Framed'	3.482	0.75
	'Loss-Framed'	6.639*	1.69
No-Funding Status	Entry Price 'About right'	-12.612**	-2.12
	Entry Price 'Too much'	-19.068**	-2.48
Funding Status Information	Entry Price 'Too little'	-8.933	-1.29
	Entry Price 'About right'	-12.731**	-2.13
	Entry Price 'Too much'	-20.730	-1.07
Experienced Value	Cultural Value	2.974	1.22
	Social Value	-0.274	-0.12
Gender	Female	0.029	0.01
[ref: Male]	Not Available	-3.091	-0.33
Occupation	Art college student	7.996**	2.18
[ref: Students]	Artist	7.386*	1.95
	Worker for a cultural institution	4.025	0.76
	Skilled manual	-1.384	-0.27
	Professional	0.523	0.14
	Retired	11.152**	2.29
	Other	8.558	0.47
Education	College diploma	8.186*	1.85
[ref: Secondary school]	University degree	4.355	1.30
	Postgraduate degree	7.711**	2.05
	Professional qualification	0.951	0.22
	Technical qualification	-1.201	-0.19
	Not Available	8.873	0.94
Household Income	£10,000 to £20,000	3.343	0.98
[ref: Less than £10,000]	£21,000 to £30,000	-2.603	-0.71
	£31,000 to £40,000	5.348	1.28
	£41,000 to £60,000	11.087***	2.80
	£61,000 to £100,000	11.075***	2.70
	More than £100,000	10.912*	1.83
	Not Available	4.791	1.16

Panel B) Selection Model Results

This table presents the selection regression results on willingness-to-donate for the Heckman selection model based on the Probit regression (statistical significance: *** at the 1%-level, ** at the 5%-level, and * at the 10%-level).

Participating in the Willingness-to-Donate Question (0/1)		**dy/dx**	**z-value**
Non-Frequent Gallery-goers	'Gain-Framed'	0.052	0.84
	'Loss-Framed'	0.064	1.04
Frequent Gallery-goers	'Unframed'	0.080	0.93
	'Gain-Framed'	-0.154*	-1.86
	'Loss-Framed'	0.056	0.67
No-Funding Status Information	Entry Price 'About right'	-0.231*	-1.76
	Entry Price 'Too much'	-0.210	-1.35
Funding Status Information	Entry Price 'Too little'	0.132	0.79
	Entry Price 'About right'	-0.182	-1.36
	Entry Price 'Too much'	-0.479***	-6.53
Previous Visit to the Exhibition	No	-0.118***	-2.62
Experienced Value	Cultural Value	0.053	1.00
	Social Value	0.113**	2.54
Gender	Female	0.023	0.52
[ref: Male]	Not Available	-0.164	-0.99
Occupation	Art college student	0.138*	1.83
[ref: Students]	Artist	0.040	0.49
	Worker for a cultural institution	-0.017	-0.15
	Skilled manual	-0.055	-0.52
	Professional	-0.043	-0.55
	Retired	-0.013	-0.13
	Other	-0.435***	-4.35
Education	College diploma	-0.067	-0.70
[ref: Secondary school]	University degree	-0.045	-0.63
	Postgraduate degree	-0.050	-0.62
	Professional qualification	-0.035	-0.38
	Technical qualification	0.020	0.15
	Not Available	-0.006	-0.03
Household Income	£10,000 to £20,000	0.136*	1.87
[ref: Less than £10,000]	£21,000 to £30,000	0.065	0.82
	£31,000 to £40,000	-0.052	-0.62
	£41,000 to £60,000	-0.026	-0.32
	£61,000 to £100,000	0.144*	1.68
	More than £100,000	-0.070	-0.58
	Not Available	-0.141*	-1.91
Pseudo R-squared			**0.11**
		Coef	**Std.Err**
rho		-0.16	0.20
sigma		17.68	0.78
lambda		-2.90	3.59
LR test of indep. eqns. (rho = 0): chi2(1) = 0.36 Prob > chi2 = 0.5468			