The Power of Emotions: Reinforcing Intrinsic Motivation to Give

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The aim of the paper is to study the impact of emotions on monetary donation to pro-environmental causes and more precisely whether emotions can reinforce intrinsic motivations. We designed a three-stage laboratory experiment. Firstly, participants have the possibility to receive an endowment from an effort game. Secondly, emotions are induced in the participants. Thirdly, participants play a dictator game where the recipient is an environmental Non-Governmental Organization (NGO). We show in compliance with the functional theory of emotion that emotions with opposite valence alter in a same way the generosity of individuals. We also show that “Awe” and “Sadness” as discrete emotions play a significant role in enhancing the level of contribution of individuals driven by intrinsic motivations.


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1. Introduction

Despite their recentness and weight compared to their counterparts of the humanitarian and the charitable fields, environmental Non-Governmental Organizations (NGOs) have been expanding especially in France. Between 2008 and 2009, public generosity in their favor grew by 14.8 percent, while NGOs as a whole grew by only 2 percent (Gaillard and Sermier [2011]). Simultaneously, although there was a strong increase in tax incentives to donate in France, growth in the number of donors was lower than in the United States (Archambault [2011]). Undoubtedly the French Jacobin tradition that the State has the monopoly to favor the public interest plays a significant role, but various studies have also shown that incentives do not always produce the desired effects on behavior, especially when individuals are driven by intrinsic motivations. By intrinsic (or internal) motivation, we mean all the individual motivations and satisfactions from one’s behavior regarding its moral sense, its duty, or its dislike.

The success of advertising campaigns like the legendary one “The Crying Indian” launched by the Keep America Beautiful NGO in the United States in the seventies suggests that emotions could be compatible or could strengthen internal motivations. Based on this observation, this paper proposes to study the impact of emotions on prosocial behavior in terms of monetary donation. We are looking to see how emotions can (or cannot) enhance the intrinsic motivations in a pro-environmental manner. The pregnancy of environmental issues in the public debate has helped to motivate the choice of the environment as a field of application. To our best knowledge, altering the emotional level to strengthen donations when

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6 Environmental NGOs have emerged mainly in the seventies while some charitable NGOs are more than a century old.

7 List [2011] reports that environmental organizations accounts for 2 percent of the U.S. household giving in 2006 by recipient status (according to the Giving USA Foundation and the Center on Philanthropy at Indiana University (2010)).
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[71x760]iduals express an initial interest towards the environmental cause has not been explored
in the economic literature.

Through a method of emotion induction followed by a dictator game where the recipient is an
environmental NGO, we show, in compliance with the functional theory of emotion
developed in psychology, that emotions with opposite valence alter in a same way the
generosity of individuals. We also show that “Awe” and “Sadness” as discrete emotions play
a significant role in enhancing the level of contribution of individuals driven by intrinsic
motivations, which are represented by waste selective sorting behavior (recycling).

The remainder of this paper is organized as follows. In Section 2, we provide a literature
review on prosocial behavior and the impact of emotions on generosity, and we state our
research objectives and strategy. In Section 3, we present our experimental protocol of which
the methodology used for the emotion induction and measurement. In Section 4, we present
our results in terms of descriptive statistics and econometric models, while in Section 5 we
offer a discussion and concluding remarks.

2. Literature review and research objectives

2.1. Motivations and prosocial behavior

Numerous experimental and empirical studies have widely demonstrated that individuals
deviate from rational selfish behavior and possess pro-social preferences. A number of
theories point out and explain people’s prosocial preferences such as altruism (Bekkers
[2007]), warm-glow feelings (Andreoni [1990]), reciprocity (Fehr and Schmidt [1999]), or
conformity to social norms (Nyborg [2006]) among others. In the economic literature, on
prosocial behavior, three types of individual motivations are highlighted: intrinsic
motivations, motivations related to self-image and extrinsic motivations (Frey [1999], Frey
and Meier [2004]).
On intrinsic motivations, the assumption is that the generosity of individuals depends on either a private preference\(^8\) for the well-being of others (Collard [1978], Andreoni [1989]), or an aversion to inequity (Rabin [1993]) or inequality (Fehr and Schmidt [1999]). Intrinsic motivations have led to an important experimental literature that has sought to empirically test the theoretical predictions relying in particular on the dictator game. Regarding motivations related to self-image, ego acts as the decisive variable that leads to prosocial behavior. Donation is used as a signal to inform other people of one’s personal qualities with regards to generosity, and this signal is strengthen with a high amount of donation (Benabou and Tirole [2011]). Finally, with extrinsic motivations, behaviors are rather analyzed in terms of motivations that can be described as external to individuals. The main idea is that prosocial behaviors are sensitive to incentives. Falk [2007] shows that the amount and frequency of charitable donations are positively related to the gift people would get in return. Fack and Landais [2010] study more specifically the role of tax incentives and show a low short-term effectiveness of the French system between 2003 and 2005 (Law on sponsorship), as the increase in donations is less than the loss in tax revenues. One explanation for this low efficiency lies in the counterproductive effect that the incentive would have on intrinsic motivation or ego: the individual accepting a tax reduction has the feeling of being greedy, which negates the personal satisfaction effect (or “warm glow”) induced by his generosity (Benabou and Tirole [2006], Ariely et al. [2009]). However, a matching contribution mechanism would restaure the full effectiveness of incentives (Eckel and Grossman [2003], Davis and Millner [2005]).

2.2. Emotions

The role of emotions in decision-making has been expanding in the economic litterature

\(^8\) This preference is regarded depending on the cases as pure or impure, *i.e.*, in the latter when we consider that the individual receives in return for his gift of a personal or « warm glow » satisfaction.
(Elster [1996, 1998], Rick and Loewenstein [2008]). The economic literature on emotions distinguishes anticipated emotions and immediate emotions. Regarding anticipated emotions, economic agents do not feel the emotion when they make their decision; they just anticipate that it will occur in the future course of action, such as pleasure or pain (Loewenstein [1987]). With regards to immediate emotions, economic agents feel them at the time of choice; they are immediate signals to individuals informing them of their own tastes. Immediate emotions may be integral, i.e., they are then linked to the decision made by the individual (Bosman et al. [2005]), or may be incidental, i.e., they are experienced by the individual when he takes the decision but they are caused by situational and dispositional sources unrelated to the task at hand (Andrade and Ariely [2009]). If the economic literature has mainly been concerned with anticipated emotions (Rick and Loewenstein [2008]), little work has been developed on the issue of incidental emotions as immediate emotions. It is to this latter type of emotion, i.e., experienced from the context but not tied to the decision, to which we refer in this paper.

The majority of economic studies dealing with emotions revive in some ways the work of Bentham, which defined the utility as the balance of pleasure and pain. In doing so, this brings emotions to the notion of valence, i.e., emotions are assessed regarding their intensity on a unilateral scale from pleasant to unpleasant; all positive emotions are handled as gains in terms of utility, and negative emotions as costs or losses (Elster [1998], Rick and Loewenstein [2008]). In psychological literature, research has shown how emotions with opposite valences could induce similar behaviors. These approaches emphasize the functional and adaptive role of emotions. The evolutionary stream in psychology highlights indeed how emotion leads to behavior insuring the evolution of the species⁹ (Tooby and Cosmides [1990]). In this line, it has been shown how two negative emotions such as anger and fear, both of which have negative valence, lead to the opposite behavior in terms of risk-taking (Lerner and Keltner

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⁹ The social stream, also in a functionalist perspective, puts the emphasis on the informational role of emotions in communication with others (e.g., Izard [1989]).
2.3. Research objectives and strategy

In our framework, we aim to analyse the interplay between emotions and pro-environmental behaviors. To do so, we focus on the following set of objectives. Firstly, we want to ensure that emotions do have an impact on individuals’ monetary donation. Secondly, we intend to assess the role of valence in explaining generosity, that is to say, whether emotions with similar valence but of different sorts have a distinguished impact or whether emotions with opposite valence may have a similar impact. Finally, we assess whether emotions have an impact on the intrinsic motivations of individuals, and consequently if they strengthen or conversely lessen these motivations. Recycling is the variable we retain as a proxy for intrinsic motivations. Viscusi et al. [2011] show indeed that there is a higher probability for people to recycle plastic water bottles when they declare themselves as an environmentalist. Returning bottles for deposit may then enable people to develop warm-glow feelings depending on intrinsic motivations.

As a consequence, we aim at testing the subsequent hypotheses:

- Hypothesis (H1): emotions have an impact on the Willingness To Pay (WTP);
- Hypothesis (H2a): emotions with similar valence but of different sorts have a distinguished impact;
- Hypothesis (H2b): emotions with opposite valence have a similar impact;
- Hypothesis (H3): emotions have an impact on intrinsic motivations.

Our study provides some continuity but also key differences with the literature previously exposed. We rely on an experimental approach based on the dictator game to test the generosity of individuals (List [2007]). This game is particularly interesting to test the generosity and prosocial behavior because it is an asymmetric game in which the recipient is
obligated to accept the sum offered by the dictator. Therefore, the dictator does not have to fear the rejection of its proposal, as this is the case in the ultimatum game. However, our study also has differences with the existing literature because rather than driving an approach in terms of intrinsic motivation or self-image in order to study potential incompatibilities with extrinsic motivations, we examine the impact of emotions on choices, particularly how they can be combined with intrinsic motivations. According to Hauser et al. [2007], it seems that moral judgments regarding various situations come under automatic processes in which emotions may have an effective place.

Furthermore, in relation to the literature dedicated to emotions, we chose two negative emotions, “Fear” and “Sadness”, and two positive emotions, “Amusement” and “Awe”. The choice of these emotions was motivated by differences they are likely to induce in individuals in terms of behavior and generosity. While fear drives individuals to protect themselves through various possible actions, such as increased attention or immobility behavior (Johnson-Laird [1968]), sadness rather drives individuals to design means to restore the initial situation before this perceived negative situation; in this sense, sadness helps to facilitate the cohesion of social groups (Averill [1968]). Thus, it is reasonable to assume that fear, which is associated with a fallback attitude, should lead to a low generous behavior unlike sadness which should lead to more generosity. The choice of positive emotions was more constrained, insofar as less work has been conducted on the topic in psychology.

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10 Note that, even among psychologists, there are many theories of emotion regarding their causes, or the order in which the components that constitute them interact. Schematically, we can distinguish three main theoretical streams: evolutionary (e.g., Cosmides and Tooby [2013]), cognitive (e.g., Lerner and Keltner [2000]) and social constructivist (e.g., Parkinson et al [2005]). In addition, psychologists agree to define emotion as an episode in which coordinated changes occur, synchronized sub-systems of the body (physical, mental, behavioral) in response to a highly significant event for the individual. These changes are the component of emotion (Scherer [1984]). In the literature, emotions are distinguished from moods and affects, in terms of latency and therefore with regards to the duration of the emotional state. For the sake of clarity and as emotional states are here felt for a short time, we use throughout this paper the term emotion following Andrade and Ariely [2009].

11 Fear occurs when the individual feels that he will not have the adequate skills to cope with a danger or a threat (Plutchik [1980]).

12 Sadness is caused by the failure of an event (project level) to which the individual attached importance (Oatley and Johnson-Laird [1987]).
(Fredrickson [2001]). However, some studies have explored the role of amusement and awe allowing us to choose these emotions. According to these studies, amusement would lead individuals to adopt riskier behaviors, as they would feel less time constraints and external threats (Smith [1982], Griskevicius et al. [2010]). Awe would increase one’s perception of available time (Keltner and Haidt [2003]), which alters consumption preferences, and makes individuals more altruistic (while being volunteer) (Rudd et al. [2012]). With regard to our study, we can rely on these results to assume that individuals experiencing amusement will be less generous towards an environmental cause, feeling less empowered, while individuals feeling awe should be more generous.

Our study appears to be complementary and close to Capra [2004] and Tan and Forgas [2010] regarding our first hypothesis (H1). These authors have studied the impact of induced emotions on generosity in particular through a dictator game but get opposite results: according to Capra [2004], positive emotions increase generosity, while Tan and Forgas [2010] show that generosity increases by means of negative emotions. As a consequence, the originality of our contribution lies mainly in the remaining hypotheses (H2a, H2b, H3). In addition, several studies have shown how changes in framing, including the importance of social norms, could significantly affect altruistic behaviors. In our experimental design we rely on the dictator game, whilst setting the recipient as an environmental NGO rather than an individual. Note that in the literature it is shown that a framework inducing a social link between the dictator and the recipient increases the incentive to donate (Engel [2011]). More specifically, Eckel and Grossman [1996] showed that the generosity of the dictator is higher

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13 We can mention here the contribution of Bosman et al. [2005] who are interested in integral emotions as immediate emotions through a «power-to-take game». Regarding the treatments, participants must make an effort to get an initial endowment. In this article, the authors did not conduct an emotion induction (although it can be assumed that the actual success in an initial task provides a positive affect), but they ask participants following the completion of the game to describe the integral emotions felt (irritation, anger, surprise, shame, etc.) during the game and to evaluate their intensity, which is a different perspective of our study.

14 Note that many studies have shown the role of emotions in the generosity of individuals, but in the ultimatum game (e.g., Sanfey [2003]). In this type of framework, integral emotions are investigated.
in a case where the recipient is the Red Cross.\textsuperscript{15}

3. Methodology and experimental design

The experiments were conducted between November 2012 and February 2013 at the Montpellier Laboratory of Experimental Economics (LEEM). 200 participants were recruited randomly from the LEEM database on condition that they have never previously participated in a dictator game; 10 sessions with 20 participants each were thus conducted. The experiments were single-blind. In our framework, we perform an emotion induction towards participants before asking them to make a monetary donation in a dictator game. In psychology, different techniques are used to cause and measure emotional states (Jallais and Gilet [2010]). We opted for a method showing slideshow pictures to the participants.

The experimental protocol was conducted in three stages.\textsuperscript{16} At first, subjects had the opportunity to earn an endowment of €20, an amount they were granted if they managed a given task. This task was to count the number of “1” present in a table containing a string of “0” and “1”. Our aim in conditioning the initial endowment to a given effort was to avoid on the one hand an automatic initial endowment creating a positive mood due to an unexpected gain, and on the other hand avoiding it appearing as a providential gain without being conditioned by an initial effort. Within the sample, 14 participants failed to complete the task and therefore did not receive the endowment of €20. Consequently, 186 observations were analyzed.

In a second stage, after the participants had received an endowment of €20, a slideshow of 15 pictures was presented to each of them to induce emotions. Four separate slideshows were compiled, and each participant had to watch one. These slideshows referred respectively to a particular emotion: two of them with a positive valence (“Amusement” and “Awe”); and, two

\textsuperscript{15} Note that the object of the NGO can influence the generosity through social distance, time horizon, etc. These factors are likely to differentiate the causes and the amounts donated. Several studies have shown the effects of social distance in the generosity of individuals including Kogut and Ritov [2005] or Loewenstein et al. [2006].

\textsuperscript{16} Protocol and guidelines of the experiments are available on request from the authors.
of them with a negative valence (“Fear” and “Sadness”). A standard treatment called “Without emotion induction” was also performed as a control treatment; participants in this session did not watch any slideshow. The selection of 60 photographs presented in the slideshows was made from an international database called “International Affective Picture System” (IAPS) (Lang et al. [2008]), which specifies the valence and intensity attached to each picture (see Appendix 1). Mikels et al.’s [2005] classification on this basis allowed us to gather pictures related to the emotions we wanted to induce.

In a third time, after viewing the slideshow, participants were invited to play in a dictator game. They were asked how much of their earnings they wanted to give to an environmental NGO. The participants had the opportunity to choose between three environmental NGOs, for which a description was previously given: World Wide Fund for Nature (WWF), Nicolas Hulot Foundation for Nature and Man and Greenpeace.

The emotional state of subjects was monitored during the experiment three times. A first assessment was made upon arrival, a second assessment was made after the emotional state was induced, and the last one at the end of the game to assess the persistance of the emotional state (see Appendix A for the assessment technique).

At the end of the experiment, information about the characteristics of the participants was collected. It was specifically asked participants if they were members of various NGOs and if they recycled (i.e., if they practiced waste selective sorting). These features were used as a proxy for their intrinsic motivations towards environmental protection as mentioned above.

To sum up, the standard protocol used to conduct the sessions includes successively: an effort game to get an endowment, emotion induction through pictures in a slideshow, and a dictator game to donate to an environmental NGO. Table 1 provides a summary presentation of the five experimental treatments that have been made on different participants. These

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17 These authors have linked each picture based on different discrete emotions (anger, fear, disgust and sadness for pictures of negative valence, and, amusement, awe, contentment and arousal for pictures of positive valence).
Experimental treatments were conducted with an equal number of participants, that is 40 participants.\footnote{18}

4. Results

Results are presented in two steps. In a first step, we analyze the emotion induction in the experimental treatments. In a second step, we study the variables that are favorable for donation to environmental NGOs.

4.1. Emotion induction

For each emotion, we built an emotional indicator, which weighs three adjectives associated with each of the emotions. “Amusement” is described by amused, entertained and delighted; “Awe” is described by amazed, dazzled and fascinated; “Fear” is described by frightened, scared and terrorized; and “Sadness” is described by distressed, grieved and saddened. Participants were asked to declare their emotional state on a 0 – 99-point scale\footnote{19} for these twelve adjectives before and after having watched the slideshow. We created a dummy indicator using these data in the following way: when the difference between the final and the initial value is positive (weighted sum of the three adjectives per emotion), then the indicator is equal to 1; conversely, when the difference is negative, the indicator is equal to 0. In Table 2, we can observe that emotional states have been heavily altered in the experimental treatments.

\footnote{18} Regarding the credibility of the amounts donated towards an environmental NGO, it was stipulated that: “Researchers in charge of the experiment swear that all the donations decided in this experiment are actually paid to the NGOs listed.”

\footnote{19} This is a conversion of a 9-point Likert scale ranging from 0 (not at all) to 8 (completely).
First, we observe that “Awe” and “Sadness” seem to have been actually induced. On the one hand, almost two thirds of the participants in the “Awe” treatment (T2) (64.86 percent) stated a greater awe level. On the other hand, 91.89 percent of the participants in the “Sadness” treatment (T4) stated a greater sadness level. Regarding “Amusement” and “Fear”, changes are less obvious: in the “Amusement” treatment (T1), awe reflected participants’ emotional state more than amusement after having viewed funny pictures (respectively 52.63 percent and 47.37 percent stated a positive change). Similarly in the “Fear” treatment (T3), sadness characterized participants’ emotional state more than fear following scary pictures viewing (respectively 56.76 percent and 48.65 percent stated a positive change).

Using a Kruskal-Wallis equality-of-populations test, we tested whether samples for each treatment appeared to come from the same population. Since the values are higher than the critical value of 9.488, we conclude that in at least one of the treatments, participants reported a change in the emotional state felt following the pictures viewing.

To confirm whether the emotions were successfully induced following the pictures viewing, we carried out a logit analysis that allows to study how emotional indicators are activated according to the treatments (Table 3). A significant coefficient means that individuals within that treatment have a higher probability to declare changes in their emotional state.

**Insert Table 2**

**Insert Table 3**
We observe that participants under “Awe”, “Fear” and “Sadness” (respectively treatments T2, T3, T4) reported emotions consistent with the pictures viewed. The probability of feeling awe increases if participants have observed awesome pictures (i.e., they belong to treatment T2). Moreover, for participants of treatments T3 and T4 the probability of feeling awe is lower. For fear and sadness, we can implement the same reasoning. It appears that participants belonging to negative emotions treatments (T3 and T4) have a higher probability to feel fear and sadness. Regarding “Amusement”, this emotional state does not increase for the participants in treatment T1. However for participants of treatments T2, T3 and T4 the probability of feeling amusement is lower.

4.2. Emotions and monetary donation

4.2.1. Contribution levels
Descriptive statistics on the levels of contribution in terms of Willingness To Pay (WTP) per treatment are given in Table 4.

Insert Table 4

We observe that the WTP levels are relatively low (on average between 12 percent and 21 percent of the €20 endowment) knowing that in general in classical dictator game an individual gives on average roughly 20 percent of its endowment according to List [2007] and less than 30 percent of its endowment according to Engel [2011]. In our case, contrary to a classical dictator game, two opposing effects are at stake. On the one hand, the amount of donations should increase because the recipient is an NGO (Eckel and Grossman [1996]). On the other hand, having made an effort to get its endowment, players should give nothing (Oxoby and Spraggon [2008]). Engel [2011] showed in a meta-analysis that the latter effect is more pronounced than the first. Our data do not show that the average levels of the various
monetary donations according to induced emotions are statistically different. However, if we consider the donors only \((WTP > 0)\), the average donation for the “Awe” treatment \((T2; \text{€6.13 on average})\) is statistically higher than the one of the “Without induction of emotion” treatment \((TC; \text{€4.46 on average, } p\text{-value } = 0.066^{20})\) and the one of the “Amusement” treatment \((T1; \text{€3.88 on average, } p\text{-value } = 0.019)\). Moreover, whilst separating the donors and the non-donors in our setting, we show that a range of 27 percent to 41 percent of the participants give nil according to the treatments, that is similar to the figures in the literature \((e.g., \text{36.11 percent in Engel’s [2011] meta-analysis})\).

4.2.2. Econometric models
The fraction of donors and non-donors among the participants as dictators leads to consider left censored data through a Tobit model in lieu of a standard Ordinary Least Squares (OLS) regression. Furthermore, we can separate the decision “to give” from the decision “how much to give”, even though the latter is conditionned by the former. This requires the use of hurdle models or selection models in order to assess the set of explanatory variables in both decisions. In our analysis we retain a class of selection models through a two-stage Heckman [1976, 1979] procedure combining a probit model and an OLS regression.

We used two different models to estimate the determinants of the Willingness To Pay \((WTP)\):

- A Tobit model with all observations \((N = 186)\) estimated by Maximum Likelihood (ML);
- A generalized Tobit model with selection estimated by a two-stage Heckman [1976, 1979] procedure: a first stage probit model selecting positive monetary donations; a second stage then estimating the determinants of positive \(WTP\) by Ordinary Least Squares (OLS) regression with the selected number of observations \((N = 120)\).

\footnote{We use a Mann-Whitney test for the unilateral difference averages.}
The explanatory variables are described in Tables 5 and 6. In the generalized Tobit model, the explanatory variables used in the probit model in stage 1 refer to socio-economic characteristics (Table 5), while the explanatory variables used in the OLS regression in stage 2 refer to emotional characteristics. The impact of emotions then explains the change of the monetary donation while this one is positive (Table 6).

Insert Table 5

Insert Table 6

The Tobit model implies that zero and positive values are the expression of a unique choice, where the same factors and a unique structure determine both the choice to give (have a positive WTP) and the amount of the donation.

It is assumed that the WTP is a latent variable denoted $y_i^*$ distributed according to a normal distribution, such as:

$$y_i^* = x_i^\prime \beta + \varepsilon_i = E(y_i^*) + \varepsilon_i$$

where $x_i^\prime$ is a vector of exogenous variables, $\beta$ is the vector of parameters associated with, and $\varepsilon_i$ represents errors following a normal distribution and distributed independently of variance $\sigma^2$.

The Tobit model is composed of a continuous part corresponding to the linear regression model, and a discrete part associated to the point of censorship for WTP values equal to 0, i.e.:

$$y_i = 0 \text{ if } y_i^* \leq 0$$

$$y_i = y_i^* \text{ if } y_i^* > 0$$

With the likelihood that $y_i^*$ takes a zero value being written:
\[ \text{Prob}(y_i^* = 0) = \Phi \left( \frac{-x_i' \beta}{\sigma} \right) \]

And with the probability that \( y_i^* \) takes a positive value writing:

\[ \text{Prob}(y_i^* > 0) = 1 - \Phi \left( \frac{-x_i' \beta}{\sigma} \right) = \Phi \left( \frac{x_i' \beta}{\sigma} \right) \]

where \( \Phi \) is the cumulative distribution function and \( \sigma \) the standard deviation.

The Tobit model is nonlinear and is estimated by Maximum Likelihood (ML).

Besides, we assume that there exists a non-random selection bias related to censorship in 0 depending on the factors determining the choice to donate (having a positive WTP), which led us to use a generalized Tobit model with selection that can be estimated by a two-stage Heckman [1976 1979] procedure:

- In the first stage, we estimate a probit model selecting and explaining positive WTP;
- In the second stage, we report the inverse Mills ratio as an additional explanatory variable for the regression estimating positive WTP by Ordinary Least Squares (OLS).

We believe indeed that the choice to donate or not to donate is endogenous, which leads us to regress the WTP with a non-random censorship. After an initial stage where an analysis is conducted through a probit model indicating the probability of giving a positive amount for an environmental NGO \( (z_i) \), the WTP is then regressed \( (y_i) \). The coefficients of the probit model allow us to correct for selection bias in our estimate.

Assume now that:

\[ y_i = x_i' \beta + \epsilon_i \]

And

\[ z_i^* = w_i' \delta + u_i \]

where \( y_i \) and \( z_i^* \) are respectively the positive WTP and the choice to donate a positive amount as a latent variable, \( x_i' \) and \( w_i' \) are vectors of exogenous explanatory variables, \( \beta \) and \( \delta \) are the
vectors of associated parameters, and $\varepsilon_i$ and $u_i$ represent errors distributed independently following a normal law with respective variance $\sigma_\varepsilon^2$ and $\sigma_u^2$, with $\rho$ the correlation coefficient between the two hazards.

The generalized Tobit model with selection estimated by the Heckman procedure is then:

$$y_i = x_i'\beta + \varepsilon_i \text{ if } z_i^* > 0$$
$$y_i = 0 \text{ if } z_i^* = 0$$

And

$$z_i = 0 \text{ if } z_i^* = 0$$
$$z_i = 1 \text{ if } z_i^* > 0$$

4.2.3. Econometric results

The results from the Tobit model are presented in Table 7.

Insert Table 7

Interestingly, the “Waste selective sorting” variable, which indicates whether the participant performs waste selective sorting in its household with regards to its internal motivations, and therefore can be interpreted as a proxy for intrinsic motivation, is significant at the 5 percent level (0.017) with a coefficient of 2.9793. This variable indicates that a selective sorter has a higher probability to donate than a non-selective sorter, and leads us to analyze the endogenous choice to donate or not to donate through a generalized Tobit model. The results thereof with the estimated two-stage Heckman [1976, 1979] procedure with bias selection are shown in Table 8.

Insert Table 8
The inverse Mills ratio $\lambda_z$ is significant at the 10 percent level indicating the presence of a selection bias regarding the non-random nature of censorship in 0. This indicates that the Tobit model ignores the interdependence between the endogenous choice to donate and the level of donation.

In stage 1, within the probit model, it appears that:  

- The “Waste selective sorting” variable is significant at the 1 percent level (0.009), a positive sign meaning that being a selective sorter greatly increases the likelihood of being a donor, and this is therefore decisive in choosing to give to an environmental NGO;
- The “Subjective perception of one’s financial situation” variable while the participant states being financially comfortable is significant at the 10 percent level (0.073), a positive sign indicating that one feeling financially comfortable increases the probability of being a donor;
- The “Education level” variable while the participant has a Bachelier degree is significant at the 10 percent level (0.071), with a negative sign indicating that participants who have not reached this level of education have a lower probability of being donors.

In stage 2, within the OLS regression, emotional variables indicate that:

- The “Emotional indicator for “Awe” level” is significant at the 1 percent level (0.008) for a coefficient of 1.99; this means that participants who were exposed to a positive emotion of awe will increase their donation levels compared to other participants (control experimental treatment and other experimental treatments where emotions were induced);

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21 For simplicity, we interpret here the signs of the coefficients in the probit model without determining the marginal effects.
- The “Emotional indicator for “Sadness” level” is significant at the 5 percent level (0.016) for a coefficient of 1.84 showing that the participants who were exposed to a negative emotion of sadness will increase their donation levels compared to other participants (control experimental treatment and other experimental treatments where emotions were induced);
- The “Waste selective sorting” variable is not significant (0.21) in the OLS regression anymore, whilst having a positive coefficient of 1.95.

5. Discussion and conclusion

Regarding the results presented in Section 4, and with regards to our research hypotheses, we can state and discuss the following lessons.

Hypotheses H1 and H2 are partially confirmed. Emotions have indeed a significant impact on the WTP (H1) through “Awe” and “Sadness”. Moreover, and according to hypothesis (H2b) we also show that “Awe” and “Sadness” both increase the WTP. Then, emotions with opposite valence may play the same role to elicit generosity. No convincing results were found for “Fear” and “Amusement”. One explanation of this failure could be that both fear and amusement have been poorly induced compared to awe and sadness. The same phenomenon could also explain the difficulty to test hypothesis (H2a), so no conclusion was drawn concerning the impact of different types of emotions with similar valence.

Concerning awe and sadness, the literature in psychology highlights their adaptative behavioral function. Firstly, awe can be described by both the concepts of vastness in terms of perception by individuals of tangible and intangible assets, and accommodation in terms of adaptation following the acquisition of new information (Keltner and Haidt [2003], Shiota et al. [2007]). Vastness, as what is experienced by individuals subject to this emotion goes beyond their mental pattern. Accommodation, in the sense that a need for adaptation occurs following exposure to this emotion and for assimilation of its effects, as well as for the
information it conveys. Thus, this conceptual combination leads individuals to change their relationship to space and time, which would open their prospects and thus facilitate their pro-environmental behavior. Rudd et al. [2012] show that individuals under awe feel that they have more time available, and that they are less anxious, increasing their desire to use their resources in time for volunteer activities. Therefore, we can assume that awe alters individual intra-generational perspectives (by projecting their own future and the one of its generation as option value) as well as inter-generational perspectives (by transmitting a capital for future generations regarding a bequest value), and thereby increases one’s generosity. Moreover, according to the evolutionary functional stream in psychology towards emotions, being exposed to awe does not generate the same information perception compared to other positive emotions (e.g., pride in Griskevicius et al. [2010]). Therefore, awe generates more analytical ability and solemnity, implying that individuals are more sensitive to issues related to the environmental protection, which generates monetary donations.

Secondly, sadness is usually associated with the appraisal of permanent loss. The experience of sadness decreases physiological arousal. People react to this situation by revising their goals and plans (Bonnano and Keltner [1997]) and engage in a more extensive deliberative decision making process. Furthermore, some studies show that sadness could encourage social activity, in particular altruism in order to balance this sad feeling and divert attention away from negative thoughts (Glomb et al. [2011], Tan and Forgas [2010]). Other studies have shown the opposite (Capra [2004]). The age of the subjects as well as their level of socialization can explain the inconsistency of these results. According to Cialdini and Kenrick [1976], the involvement in prosocial behavior generates self-gratification and the reward associated depends on people’s socialization experience. In our experiment, it seems that sadness has made people careful regarding the amount to give and the impact of their decision
on the environment (through the description of three environmental NGOs’ objects). This decision process may trigger altruistic behavior to counterbalance their sad emotional state.

In line with our previous results, with respect to hypothesis H3, we can observe that emotions reinforce individual monetary donation behaviors driven by internal motivations. In the generalized Tobit model estimated using the two-stage Heckman [1976, 1979] procedure, it appears that the “Waste selective sorting” variable, which we defined as a proxy for intrinsic motivation, is significant about the probability of giving and then the “Emotional indicator for “Awe” level” and the “Emotional indicator for “Sadness” level” variables are significant in the substantial equation, which corresponds to the significance of giving. We can therefore observe that awe and sadness strengthen individuals with intrinsic motivations to give, unlike the antagonism we usually note between intrinsic and extrinsic motivations. Obviously, this result would require to be confirmed by studies conducted on emotions of different sorts, both positive and negative. According to our results, emotions do not drive donation as a trigger effect, but instead highlights a tendency to give to donors. Indeed, if the emotions affect the amount that individuals donate, it does not seem however that they have an impact on the probability of giving or not.

To conclude, the use of emotions in various advertising campaigns to provide incentives to enhance donations can raise several issues. While other papers focus on the level of matching grants ratio that motivate people to give (List [2011]), in our case we highlight the role of emotion. Indeed, in an information report on environmental NGOs to the French National Assembly, Geneviève Gaillard and Jean-Marie Sermier [2011] stress that environmental NGOs use the sensitive fiber to touch people and thus that “a passer-by will give more easily to protect polar bears and Bengal tigers” (pp. 14-15), which refers to iconic species in terms of biodiversity unlike ordinary biodiversity. Moreover, they justify these means: “When the cause remains legitimate, this behavior may remain eligible” (pp. 14-15). To some extent, this
is in accordance with the soft paternalism literature (Sunstein and Thaler [2003]), stating that the government intervention may be desirable in some cases to mitigate individual failures, whilst leaving individuals free of their choices: “In a sense, behavioral economics extends the paternalistically protected category of ‘idiots’ to include most people, at predictable times. The challenge is figuring out what sorts of ‘idiotic’ behaviors are likely to arise routinely and how to prevent them, while imposing minimal restrictions on those who behave rationally” (Camerer et al. [2003], p. 1218). This debate raises complex moral philosophy that go well beyond the scope of our paper and the field of behavioral economics. Nonetheless, economists could not ignore these issues in the decision theory anymore.

References


BEKKERS, R., Measuring Altruistic Behavior in Surveys: The All-or Nothing Dictator Game, Survey Research Methods, 2007, 1(3), 139-144.


ECKEL C., GROSSMAN P., Rebate Versus Matching: Does How we Subsidize Charitable


Psychology, 2011, 64(1), 191-223.


Appendix A. Methodological material

*Pictures selected in the International Affective Picture System (IAPS) (Lang et al., 2008)*

We selected pictures in the IAPS database on the one hand according to their score in valence and intensity, and on the other hand with regards to their nature. The nature of emotions of negative valence was evaluated in the IAPS framework by participants who were asked to what extent the state in which they were matched one of the following four terms: anger, fear, disgust and sadness. The two negative emotions that we have selected are the ones having obtained the highest scores. We used the same process to select the two positive emotions of positive valence out of amusement, awe, contentment and arousal.

To induce amusement, the 15 pictures that have been selected are: 1340, 1463, 1810, 1811, 1920, 1999, 2070, 2091, 2216, 2340, 2341, 2345, 2352, 2791, 8420.

To induce awe, the 15 pictures that have been selected are: 1650, 1850, 5300, 5470, 5480, 5600, 5621, 5626, 5661, 5890, 5700, 5820, 7580, 7510, 8021.

To induce fear, the 15 pictures that have been selected are: 1022, 1052, 1120, 1201, 1300, 1302, 1321, 1930, 5940, 5972, 6230, 6300, 6520, 6211, 6260.

To induce sadness, the 15 pictures that have been selected are: 2141, 2205, 2312, 2520, 2700, 2900, 9001, 9041, 9210, 9415, 9421, 9470, 9520, 9530, 9561.

*Emotion assessment*

The participants were asked to rate twelve adjectives related to the four emotional states, with respectively three adjectives characterizing each state.

The adjectives used were:

- “Amusement”: amused, entertained, delighted;
- “Awe”: amazed, dazzled, fascinated;

---

22 For each emotion induced we list the corresponding number of the pictures in the IAPS database; our commitment to access and use the database prevents us from disclosing the pictures.
- “Fear”: frightened, scared, terrorized;
- “Sadness”: distressed, grieved, saddened.

Each word remained displayed in the center of the screen until the participant had given its answer. Each participant had to indicate how much each adjective corresponded to its current state on a 0 – 99-point scale (conversion of a 9-point Likert scale ranging from 0 (not at all) to 8 (completely)).

To avoid the introduction of any anchoring bias (memory effect), adjectives were presented in a different order at each of the three stages of the experiment through a random selection (Table 9).

*Insert Table 9*
| TC: | **Without emotion induction**  
Dictator game (monetary donation to an environmental NGO) |
|-----|-----------------------------------------------------------------|
| T1: | **Emotion induction, Amusement**  
Dictator game (monetary donation to an environmental NGO) |
| T2: | **Emotion induction, Awe**  
Dictator game (monetary donation to an environmental NGO) |
| T3: | **Emotion induction, Fear**  
Dictator game (monetary donation to an environmental NGO) |
| T4: | **Emotion induction, Sadness**  
Dictator game (monetary donation to an environmental NGO) |
Table 2. Change in the emotional state following the pictures viewing: percentage of positive change stated by the participants per emotion and per treatment

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>( p )-value bilateral (probability)</th>
<th>( k )-value Kruskal-Wallis test / Chi-squared with ties values (probability)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amusement (%)</td>
<td>47.37</td>
<td>35.14</td>
<td>8.11</td>
<td>2.70</td>
<td>0.0001</td>
<td>28.42 (0.0001)</td>
</tr>
<tr>
<td>Awe (%)</td>
<td>52.63</td>
<td>64.86</td>
<td>16.22</td>
<td>10.81</td>
<td>0.0001</td>
<td>34.08 (0.0001)</td>
</tr>
<tr>
<td>Fear (%)</td>
<td>5.26</td>
<td>18.92</td>
<td>48.65</td>
<td>54.05</td>
<td>0.0008</td>
<td>28.39 (0.0001)</td>
</tr>
<tr>
<td>Sadness (%)</td>
<td>13.16</td>
<td>18.92</td>
<td>56.76</td>
<td>91.89</td>
<td>0.0001</td>
<td>60.28 (0.0001)</td>
</tr>
</tbody>
</table>
Table 3. Logit analysis of the emotional indicators regarding the emotion induced

<table>
<thead>
<tr>
<th></th>
<th>Constant</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amusement</td>
<td>0.27</td>
<td>-0.38</td>
<td>-0.89*</td>
<td>-2.7***</td>
<td>-3.86***</td>
</tr>
<tr>
<td>Awe</td>
<td>-0.27</td>
<td>0.38</td>
<td>0.89*</td>
<td>-1.37**</td>
<td>-1.84***</td>
</tr>
<tr>
<td>Fear</td>
<td>-1.13</td>
<td>-1.76</td>
<td>-0.32</td>
<td>1.08*</td>
<td>1.3***</td>
</tr>
<tr>
<td>Sadness</td>
<td>-1.64</td>
<td>-0.25</td>
<td>0.19</td>
<td>1.91***</td>
<td>4.07***</td>
</tr>
</tbody>
</table>

Notes:

*** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level
Table 4. Descriptive statistics of the Willingness To Pay (WTP) regarding the emotion induced

<table>
<thead>
<tr>
<th></th>
<th>TC</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean WTP (€)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Standard deviation)</td>
<td>(4.12)</td>
<td>(3.83)</td>
<td>(4.70)</td>
<td>(4.02)</td>
<td>(3.21)</td>
</tr>
<tr>
<td>Percentage of the monetary endowment given to an environmental NGO on average (%)</td>
<td>21</td>
<td>12</td>
<td>19</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>37</td>
<td>38</td>
<td>37</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td><strong>Mean WTP for the participants as donors (WTP &gt; 0) (€)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Standard deviation)</td>
<td>(4.48)</td>
<td>(4.22)</td>
<td>(4.61)</td>
<td>(4.09)</td>
<td>(2.88)</td>
</tr>
<tr>
<td>Percentage of the monetary endowment given to an environmental NGO on average for donors (WTP &gt; 0) (%)</td>
<td>22</td>
<td>19</td>
<td>31</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td><strong>N if WTP &gt; 0</strong></td>
<td>24</td>
<td>24</td>
<td>23</td>
<td>27</td>
<td>22</td>
</tr>
<tr>
<td><strong>Percentage of the participants giving nil (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>N if WTP = 0</strong></td>
<td>13</td>
<td>14</td>
<td>14</td>
<td>10</td>
<td>15</td>
</tr>
</tbody>
</table>

*Note:*

*N* represents the number of observations
Table 5. Definitions and descriptive statistics of the explanatory variables in the econometric modelling

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Participant gender: Gender = 1 if “Male” Gender = 0 if “Female”</td>
<td>0.494</td>
<td>0.501</td>
</tr>
<tr>
<td>Sport</td>
<td>Participant membership to a sport organization: Sport = 1 if “Member” Sport = 0 otherwise</td>
<td>0.655</td>
<td>0.476</td>
</tr>
<tr>
<td>NGO</td>
<td>Participant membership to an NGO: NGO = 1 if “Member” NGO = 0 otherwise</td>
<td>0.370</td>
<td>0.484</td>
</tr>
<tr>
<td>Waste selective sorting</td>
<td>Participant undertaking waste selective sorting: Waste selective sorting = 1 if “One undertakes selective sorting within one’s household” Waste selective sorting = 0 otherwise</td>
<td>0.827</td>
<td>0.378</td>
</tr>
<tr>
<td>Subjective perception of one’s financial situation</td>
<td>Participant and its financial situation: Subjective perception of one’s financial situation = 1 if “Participant states being financially comfortable” Subjective perception of one’s financial situation = 2 if “Participant states being tight financially” Subjective perception of one’s financial situation = 3 if “Participant states being very tight financially”</td>
<td>2.16</td>
<td>0.734</td>
</tr>
<tr>
<td>Education level</td>
<td>Participant and its education level: Education level = 1 if “Bachelier” Education level = 2 if “Graduated of a Bachelor degree (BA / BSc)” Education level = 3 if “Graduated of a Master’s degree (MA / MSc) or a PhD”</td>
<td>2.30</td>
<td>0.783</td>
</tr>
<tr>
<td>Variable</td>
<td>Description</td>
<td>Mean</td>
<td>Standard deviation</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Emotion Induction “Amusement”</td>
<td>Experimental treatment in which the “Amusement” emotion has been induced (T1)</td>
<td>0.198</td>
<td>0.400</td>
</tr>
<tr>
<td>Emotion Induction “Awe”</td>
<td>Experimental treatment in which the “Awe” emotion has been induced (T2)</td>
<td>0.204</td>
<td>0.404</td>
</tr>
<tr>
<td>Emotion Induction “Fear”</td>
<td>Experimental treatment in which the “Fear” emotion has been induced (T3)</td>
<td>0.198</td>
<td>0.400</td>
</tr>
<tr>
<td>Emotion Induction “Sadness”</td>
<td>Experimental treatment in which the “Sadness” emotion has been induced (T4)</td>
<td>0.198</td>
<td>0.400</td>
</tr>
<tr>
<td>“Amusement” level following induction</td>
<td>Assessment of the “Amusement” stated level</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>“Awe” level following induction</td>
<td>Assessment of the “Awe” stated level</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>“Fear” level following induction</td>
<td>Assessment of the “Fear” stated level</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>“Sadness” level following induction</td>
<td>Assessment of the “Sadness” stated level</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Emotional indicator for the “Amusement” level</td>
<td>Change of the “Amusement” stated level following induction</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Emotional indicator for the “Awe” level</td>
<td>Change of the “Awe” stated level following induction</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Emotional indicator for the “Fear” level</td>
<td>Change of the “Fear” stated level following induction</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Emotional indicator for the “Sadness” level</td>
<td>Change of the “Sadness” stated level following induction</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Table 7. Willingness To Pay (WTP) parameters estimate within a Tobit model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard deviation</th>
<th>t</th>
<th>P &gt;</th>
<th>t</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>1.2660</td>
<td>2.4800</td>
<td>0.51</td>
<td>0.610</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-0.4424</td>
<td>0.8783</td>
<td>-0.50</td>
<td>0.955</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport</td>
<td>0.0529</td>
<td>0.9369</td>
<td>0.06</td>
<td>0.906</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Governmental Organization (NGO)</td>
<td>0.6340</td>
<td>0.9295</td>
<td>0.68</td>
<td>0.496</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste selective sorting</td>
<td>2.9793</td>
<td>1.2330</td>
<td>2.42</td>
<td>0.017**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective perception of one’s financial situation: being financially comfortable</td>
<td>0.8044</td>
<td>1.1875</td>
<td>0.68</td>
<td>0.499</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective perception of one’s financial situation: being financially tight</td>
<td>0.1971</td>
<td>0.9984</td>
<td>0.20</td>
<td>0.841</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education level: Bachelor</td>
<td>-3.0375</td>
<td>2.2332</td>
<td>-1.36</td>
<td>0.176</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education level: Graduated of a Bachelor degree (BA / BSc)</td>
<td>-1.9655</td>
<td>2.1155</td>
<td>-0.93</td>
<td>0.354</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education level: Graduated of a Master’s degree (MA / MSc) or a PhD</td>
<td>-2.5655</td>
<td>2.0689</td>
<td>-1.24</td>
<td>0.217</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N = 186; 66 observations are left-censored for a WTP = 0

Log Likelihood: -424

Notes:

*** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level
Table 8. Selection equation and substantial equation estimates within a generalized Tobit model (Heckman two-stage estimate procedure)

**Stage 1: Probit model**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard deviation</th>
<th>t</th>
<th>P &gt;</th>
<th>t</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.38</td>
<td>0.69</td>
<td>0.55</td>
<td>0.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-0.20</td>
<td>0.20</td>
<td>-1</td>
<td>0.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport</td>
<td>0.22</td>
<td>0.21</td>
<td>1.01</td>
<td>0.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Governmental Organization (NGO)</td>
<td>-0.07</td>
<td>0.21</td>
<td>-0.35</td>
<td>0.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste selective sorting</td>
<td>0.68</td>
<td>0.26</td>
<td>2.63</td>
<td>0.009***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective perception of one’s financial situation: being financially comfortable</td>
<td>0.51</td>
<td>0.29</td>
<td>1.79</td>
<td>0.07*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective perception of one’s financial situation: being financially tight</td>
<td>0.29</td>
<td>0.22</td>
<td>1.3</td>
<td>0.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education level:</strong> Bachelor</td>
<td>-1.19</td>
<td>0.66</td>
<td>-1.8</td>
<td>0.07*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education level: Graduated of a Bachelor degree (BA / BSc)</td>
<td>-0.57</td>
<td>0.65</td>
<td>-0.88</td>
<td>0.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education level: Graduated of a Master’s degree (MA / MSc) or a PhD</td>
<td>-0.79</td>
<td>0.64</td>
<td>-1.24</td>
<td>0.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mills ratio ((\lambda_Z))</strong></td>
<td>3.93</td>
<td>2.12</td>
<td>1.86</td>
<td>0.063*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Stage 2: Ordinary Least Square (OLS) estimate, positive Willingness To Pay (WTP > 0) regression

| Variable                          | Coefficient | Standard deviation | t     | P > |t| |
|----------------------------------|-------------|--------------------|-------|-----|---|
| Constant                         | -0.52       | 2.32               | -0.22 | 0.82|
| Emotional Indicator for “Awe” level | 1.99        | 0.75               | 2.64  | 0.008***|
| Emotional Indicator for “Sadness” level | 1.84        | 0.76               | 2.42  | 0.016**|
| Waste selective sorting          | 1.95        | 1.55               | 1.26  | 0.21|

N = 120 in stage 2 following the selection from stage 1.

Notes:

*** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level
Table 9. Assessment of the emotional levels through qualifying adjectives: sets of random order presented to the participants at each of the 3 stages of the experiment

<table>
<thead>
<tr>
<th>Random order 1</th>
<th>Random order 2</th>
<th>Random order 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Fascinated</td>
<td>Grieved</td>
<td>Entertained</td>
</tr>
<tr>
<td>2 Terrorized</td>
<td>Fascinated</td>
<td>Saddened</td>
</tr>
<tr>
<td>3 Grieved</td>
<td>Dazzled</td>
<td>Amazed</td>
</tr>
<tr>
<td>4 Delighted</td>
<td>Amused</td>
<td>Scared</td>
</tr>
<tr>
<td>5 Amazed</td>
<td>Distressed</td>
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<tr>
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<td>10 Frightened</td>
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<tr>
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</tr>
<tr>
<td>12 Entertained</td>
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