Cultural Education and the Voluntary Provision of Cultural Goods: An Experimental Study

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Abstract

We study the effect that the possibility of investing in cultural education has on the voluntary contributions to a cultural good. This is done in a two-stage public-good experiment. We also provide treatments with different context in order to control for a possible framing effect. Our results show the absence of an effect of cultural education on the contributions to the cultural good and a slight increase in the allocations of subjects' endowments to the cultural good when the cultural context is implemented in the laboratory.

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1. Introduction

This paper deals with a public-good game in a cultural goods setting. We analyse the individuals' choices regarding the voluntary provision of cultural goods in an experimental context. The possibility to apply the public good framework to the cultural goods is widely supported in the literature (Scandizzo, 1992; Mazza, 1993; Throsby, 1994; Pethig and Cheng, 2000; Finocchiaro Castro and Mazza, 2001). In particular, the dominant "public nature" of the cultural goods can be inferred when we consider the provision of cultural goods at a social level. Thus, we can include both of the characteristics of non-rivalry and non-excludability into the definition of cultural goods, given the relevance of those goods for the society as a whole (Mossetto, 1993; Trimarchi, 1993).

The application of the experimental procedure to cultural economics represents a novelty to both fields of research. To the best of our knowledge, there are not any experimental works aimed at testing theoretical problems coming from cultural economics. Our work, also, represents an original contribution to the cultural economics literature. In fact, there are no works investigating the changes in the individual voluntary contributions to cultural goods due to the previous possibility to invest in cultural education, as far as we know. Referring to the relevant literature (Champarnaud et al., 2002; Fryer, 2002; van der Ploeg, 2002), we can define the cultural education as a process of acquisition of competence in order to better understand the different forms of art. Then, it is evident that the investment in cultural education has both a private and a public component. More specifically, the former is given by the individual satisfaction from the art consumption due to the increased skills in arts; the latter is represented by the positive externality generated by the higher level of cultural education reached at social level (Klamer, 1996; Finocchiaro Castro and Mazza, 2001; Throsby, 2001; van der Ploeg, 2002). In our analysis, we will only consider the public component of cultural education because it is the most relevant when the total level of cultural education reached in a society matters.

Our paper aims at testing two hypotheses using a two-stage public goods game. The first hypothesis focuses on the effects of investments in cultural education on the provision of cultural goods. In fact, we consider that the investments in cultural education can lead to an increase in the individual appreciation of cultural goods consumption and, therefore, to higher levels of subjects' contributions to the cultural goods. This view is supported by Throsby (2001, pag.114), who affirms that "it is apparent that a person's enjoyment of music, literature, drama, the visual arts and so on and hence her willingness to spend money on consuming them, are importantly related to her knowledge and understandings of these art forms. Such a cultural competence is acquired through education and experience, and hence stronger and more discriminating tastes for the arts are likely to be shown by better educated and by those who have already become consumers". Therefore, there are two forces able to influence the allocation of individual endowments to the provision of cultural goods: education and previous consumption. In this paper we focus on the effects of cultural education which has been, according to our opinion, not fully explored yet.

The second hypothesis we investigate verifies the presence of a framing effect (Tversky and Kahneman, 1981; Andreoni, 1995; Fehr, Gaechter and Kirchsteiger, 1997; Eckel and Grossman, 1996; Abbink and Hennig-Schmidt, 2002) due to the implementation of a "cultural context" in some treatments of the experiment. What we want to look for is, first, the existence and, then, the magnitude of the effect of the switch in the experimental instructions from a neutral to a loaded wording. Then, compared with the neutral context, we expected it to assist to an increase in the subjects' contribution levels to the cultural good in the cultural context treatments. Strikingly, our prevision about contributions to cultural goods, most of the times, has not been confirmed by experimental data, showing only a slight difference in contributions due to the framing effects.

The present paper is structured as follows. Section 2 reviews the relevant results coming from the literature on framing effects. Section 3 describes the experimental design and the theoretical predictions. Section 4 presents and discusses the results of the experiment and Section 5 concludes.

2. Background

2.1 The Public Good Nature of Culture

In the last decades economists seem to concern more and more about the link between the preservation and restoration of historical buildings, the level of cultural good and the economic theory (Champarnaud et al., 2002; Fryer, 2002; van der Ploeg, 2002). One of the first puzzles to be solved by the economists trying to apply the main tools of economic theory to cultural matters has been the definition of cultural good. Given that the aim of the present work is not to solve this puzzling question, we will consider only the "public good" nature of cultural goods, which is, by the way, one of the most widely mentioned characteristic among the cultural economics literature (Blaug, 1976; Ginsburgh and Menger, 1996; Hutter and Rizzo, 1997; Towse, 1997; Frey, 2000; Throsby, 2001).

The main effect coming from the public good nature of cultural goods is the presence of positive externality for the whole society when these goods are provided (Scandizzo, 1992; Mazza, 1993; Throsby, 1994; Pethig and Cheng, 2000; Finocchiaro Castro and Mazza, 2001). As it has been noted by Mazza (1993, pg.37) "although cultural goods may be rival in consumption, it is often suggested that they produce 'national feeling' benefits which are non-excludable". A similar opinion is the one pursued by Mossetto (1993, pg.96) who describes the ambiguous role of artistic goods saying that "artistic goods are endowed with non-excludability even if the consumption is sometimes rival". Moreover, Sable and Kling (2001) point out that, while in some cases exclusion from the benefits of a cultural good may be technically possible it is typically not desirable, and that, in some cases the nature of the cultural good is such that at some threshold the good becomes rival in consumption due to congestion. However, we will consider the provision of cultural goods at a social level in order to be able to include both of the characteristics of non-rivalry and non-

excludability into the definition of cultural goods, given the relevance of those goods for the society as a whole[1].

2.2 Framing in Experiments

Before describing the state of arts regarding the results on the effects of framing in public goods experiments, let us explain what *framing* commonly means. A clear and, at the same time, broad definition of framing can be borrowed from Elliot and Hayward (1998, pg.232). They describe a frame as "a framework within information is considered, selected, interpreted, evaluated or simply understood". The authors go further on with their analysis stating, in the same paragraph, that "framing is then any manipulation of factors causing a change in an individual's frame such that a predictable behaviour is affected, that predictable behaviour is a framing effect". The relevant literature, suggests the presence of two types of framing: the *pure-framing* and the *valence framing*. The former occurs when subjects are presented with alternative, although perfectly equivalent, problem wordings (see Albers and Harstad, 1991; Kashima and Maher, 1995). Differently, the latter refers to situation where the information is presented to the subjects either in a negative or in a positive light[2].

A significant number of studies on economics and psychology have focused on the analysis of valence framing effects. The first and, probably, most important contribution is the one of Tversky and Kahneman (1981) that has been replicated several times finding substantial regularities in the results (Bohm and Lind, 1992; Knetsch and Sinden, 1984; Kahneman and Knetsch, 1992; Bateman et al., 1997a and 1997b).

Relatively few studies have investigated the effects due to valence framing in public goods experiments. An interesting attempt to analyze the impact of positive versus negative framing in a standard linear public goods experiment has been run by Andreoni (1995a) and replicated by Park (2000) without fully supporting Andreoni's findings.

[1] This point of view is suggested by Trimarchi (1993).
[2] For a detailed review of valence framing studies see Levin, Schneider and Gaeth (1998).

At the same time, other works confirm the presence of strong framing effects on cooperation. In particular, subjects appear to be more willing to cooperate when they face a positive framing than when facing a negative framing (Sonnemans et al., 1998; Willinger and Ziegelmayer, 1999; Cookson, 2000).

2.3 Neutral Context versus in-Context Experimental Settings

One of the first advices when writing the instructions for an experiment is to avoid any kind of suggesting words (see, e.g. Davis and Holt, 1993). Every sentence has to be neutrally formulated in order to exclude the case for any expressions that may affect the behaviours of subjects. Thus, the majority of experimental studies implement a neutral and abstract set of instructions, although applicable to real-world situations. However, the attempt at replicating real-world decision problems starkly contrasts the need for an abstract terminology to be adopted, ending up with some difficulties in properly interpreting the experimental findings. Interesting examples of the effects of loaded instructions on experimental results may be taken from many different applications of experimental economics: beneficent behaviour and crowding out hypothesis (Bolton and Katok, 1995); dictator game (Eckel and Grossman, 1996); labour (Fehr, Gaechter and Kirchsteiger, 1997); public choice (Potters and van Winden, 2000); ultimatum game (Hoffman, McCabe and Smith, 2000); rational choice and public policy (Druckman, 2001); corruption economics (Abbink and Hennig-Schmidt, 2002).

In our paper, we will stress the importance of the adoption of the experimental methodology to investigate the effects of changes in the context, when applied to different kinds of economic issues. The same consideration is pointed out by Loomes (1999, pg.39) “it may be more useful to try to study the impact of context than to pursue the impossible goal of eliminating it”. According to us, this problem seems to be even more in the need of an answer when social and cultural factors as well as other-regarding behaviour matter.

3. Experimental Design and Predictions

3.1 The Design

Our experimental setting involves two treatments, each of them played for 10 periods. The first treatment is a standard public-good game with participants divided into five groups of four players. All subjects are endowed with six tokens. They have to decide on the allocation of their endowment between two projects A (x_i) and B (g_i). Each token placed in project A (x_i) earns one Experimental Currency (EC) for the subject. Differently, each token allocated to project B (g_i) gives exactly the same payoff to every member of the group as showed by the second term of the right member of the first equation in (1). In particular, the marginal per-capita return from the tokens allocated to Project B is 0.3. Then, each subject has to maximize the following payoff function,

$$\pi_i = x_i + 0.3\sum_{i=1}^{4} g_i, \quad s.t. \;\; x_i + g_i = 6 \tag{1}$$

The second treatment is organised as a two-stage public goods game, where the second stage of the game is identical to the first treatment. During stage I, subjects are asked to decide whether to allocate their initial endowment of six tokens between two projects C (y_i) and D (z_i). They are told that the payoff from project C (y_i) will be available at the beginning of each period of stage II, directly added up to their initial endowment for that phase and that the payoff from project D (z_i) is the same for each member of the same group and it depends on the contribution of all the members to this project. At this point stage II starts. At the end of each period of stage II, subjects have the following payoff function,

$$\pi_i = (x_i + y_i) + \left(0.4\sum_{j=1}^{4} z_j + 0.3\sum_{j=1}^{4} g_j \right), \quad s.t. \;\; y_i + z_i = 6 \;\text{ and }\; x_i - z_i + g_i = 6 \tag{2}$$

Considering equation (2), it is important to remind that the term with the summation symbols in square brackets represents the earnings accruing equally to each member of the group

from both of projects D and B. In this case, the marginal return accruing to every subject from project D is 0.4.

Our experiment also deals with the investigation of possible framing effects due to the adoption of loaded instructions. In order to accomplish this task, we run the two treatments described above both in a neutral context and in a cultural context. The cultural context only differs from the neutral context in the adoption of a loaded wording recalling some cultural concepts relevant to our analysis. Table 1 presents a clear description of the changes adopted in the cultural context, all the other features of the treatments remaining the same as in the neutral context.

To summarize, we had a 2x2 treatment design with five groups of four subjects in each treatment. All the treatments lasted for ten periods. We implemented a fixed matching protocol[3]. That is, each subject played with the same group members during each treatment. The first treatment (T1NC) was a standard public good game; while the second treatment (T2NC) was organised as a two-stage public goods game, where the second stage of the game was equal to the first treatment. Finally, the third (T1CC) and fourth (T2CC) treatment were exactly the same as, respectively, the first and the second treatment, with the only difference given by the implementation of a cultural context instead of a neutral one.

- Table 1 about here -

The experiment has been conducted at the University of Catania. A total of 80 subjects have been recruited among a population of students from a wide range of studies such as Economics, Law and Political Science. Each student joined only one treatment of the experiment. The ECD staff of the University of Catania has developed the experimental software. Before beginning the experiment, the instructions have been read aloud and explained in detail. Any kind of communication was forbidden. Subjects typed written responses directly into the computer in their

[3] Subjects were aware that the software was assigning to each of them a new subject number after each period of the experiment. This is usually done in order to avoid any reputation effect within each group.

own time. At the end of each treatment, subjects were paid anonymously in cash at an exchange rate of 0.10 euro per token earned. On average, the subjects earned 16.50 euro including a 5 euro show-up fee.

3.2 Predictions

According to the standard game-theoretic approach, the Nash dominant strategy, obtained applying the backward induction procedure, foretells zero contribution to the provision of cultural goods and zero investment in cultural education. In other words, each subject should be playing the free-riding strategy. This is the well-known path of choices to be followed by all the self-interested fully rational subjects. Considering the second treatment, this strategy leads to the payoff of 12 tokens when everyone in the group is a free-rider.

However, considering our experimental setting, the Nash equilibrium does not coincide with the Pareto efficient solution. The latter suggests that, in the second treatment, each member of a group has to invest all of her endowment of stage I in cultural education, and all the resources available in stage II in the provision of cultural goods. In other words, subjects should choose to fully cooperate. This possible outcome may be due to subjects' concerns for efficiency. In fact, individuals may prefer to give up the possibility to achieve a higher individual payoff in order to increase the group payoff, considering this choice as the most efficient one. Clearly, efficiency concerns lead to the highest possible payoff for the group as a whole, which corresponds to 16.8 tokens to each member.

Moreover, our experiment allows for at least two other possible interesting outcomes, although they rarely occurred in our data. The first is the case when the members of a group are not so much willing to invest in cultural education during stage I but they are ready to contribute all of their endowments to the provision of cultural goods. This strategy is leading to an individual payoff of 14.4 tokens, in the case of zero contributions to the cultural education. There are several possible explanations to justify this pattern of choices.

First, subjects may feel already sufficiently educated and, then, they prefer to save tokens during stage I to contribute more to the provision of cultural goods than subjects investing in cultural education. Second, they could be simply not interested in increasing their appreciation of cultural good consumption but, at the same time they want to do “the right thing” contributing to the cultural goods. This motive for contributing may be seen as a kind of warm glow emanating from the contribution to the cultural goods (Bagnoli and Lipman, 1992; Andreoni, 1990). In this case, subjects are supposed to gain utility from the contribution per se without any interest in how it can affect their endowments and in the level of the provision of the cultural goods achieved by the group. Third, although being cooperators, subjects may not have understood properly the role of investment in cultural education as source of positive externality (Andreoni, 1995b).

The second possible outcome of our experimental setting reflects the case where all the members of a group decide to invest all their endowments, available in stage I, into cultural education but they contribute very little to the provision of cultural goods. This strategy is leading to an individual payoff of 15.6 tokens if there are zero contributions to the cultural good. At a first glance, it could seem to be an illogic choice. In fact, if a subject is willing to increase her knowledge and appreciation of arts, she should be ready to participate to the diffusion of cultural goods in the society. Therefore, we do not expect either any self-interested or cooperator subjects, joining the experiments, to undertake this pattern of choices unless because of errors or confusion (Andreoni, 1995b). Nonetheless, moving away from game-theoretical reasoning, there may be people considering being themselves part of an elite when spending money and time on cultural education even if they do not care of the provision of cultural goods. We control for this prestige-seeking motive not communicating the individual contributions to the cultural goods to the other members of the group. In fact, subjects moved by prestige would only contribute to the cultural good if their donations are publicly announced to their peers.

4. The Results

4.1 The data

Before analysing the effects of cultural education and framing, we discuss some general aspects of our data. In order to do so, we make use of Table 2 to show the average level of contribution of each treatment as a percentage of the endowment. We begin by looking at the differences in the rates of contribution to the cultural good between the first (T1) and the second (T2) treatment. The contributions to the cultural good from T1 are always higher than the ones from stage II of T2, regardless of the framing adopted. On average, the level of contribution is 47.1% in T1 and 37.5% in T2. The same can be said if we consider only the results from period 1. In fact, while T1 starts at a very high level of contributions (62.1%), the second treatment shows lower level of contributions (47%)[4].

- Table 2 about here -

From Table 2, we can also analyse the levels of contribution to the cultural education achieved during the second stage of T2. First, we can notice that, on average, the contributions made under the cultural context (37.3%) are higher than the ones done under the neutral context (32.6%). At the same time, if we check more in details the levels of contribution per period, an interesting result stands out from the data. While, until period 4, the values of cultural education in the neutral context are higher than the ones in the cultural context, they decrease below the values of cultural education reached in the cultural context from period 5 to period 10.

Turning our attention to the patterns of the contributions to the cultural good, we analyse the relationship between the time trend and the aggregate values of T1 and T2. They show decreasing patterns and their relationships are negative and significant at the 0.01 level with p=0.00 and p=0.03

[4] Note that those levels of cooperation are perfectly in line with other experimental results on public goods (see Ledyard, 1995; Davis and Holt, 1993).

in T1 and T2 respectively[5]. It is important to notice that both trends end up far away from the Nash prediction of complete free-riding (36.3% in T1 and 29.5% in T2) and without showing any relevant end-game effect. In T1, the level of contribution in the last period (36.3%) is higher than the previous one (35.4%). At this point, it is interesting to analyse the relationships between the time trend and each of the four treatments separately. In other words, we consider the effects of the change in the context adopted. The decreasing patterns present in Fig.1 seem to be the same across the treatments, while there is a stronger end-effect in the second treatment than in the first treatment.

- Figure 1 about here -

Moreover, three treatments out of four show a negative and significant correlation between the time trend and the contributions to the cultural good with p_{T1NCcg}=0.01, p_{T1CCcg}=0.01 and p_{T2NCcg}=0.00 respectively. The only treatment showing a not significant level of correlation with the time trend, although still negative, is T2CC. This is the only case showing an increasing pattern of contributions from period 6 to period 10. It explains why its relationships with the time trend is not significant with p_{T2CCcg}=0.674. Finally, we consider the contributions to the cultural education made during the first stage of treatment T2NC and T2CC. Also in this case, we can notice the late effect of framing on the contributions to the cultural education when the cultural context is adopted. While the correlation between time trend and the contributions to the cultural education in the neutral context is negative and significant (p_{T2NCce}=0.00), the result from the cultural context shows a negative but not significant level of correlation with p_{T2CCce}=0.139. From Fig.2, it is possible to see the difference in the trends of the two treatments. The values coming from the cultural context are always greater than those of the neutral context after period 4, although they both show the usual decreasing trend reflecting the end-effect.

[5] The p-value refers to the 2-tailed Pearson correlation test.

4.2 The effects of Cultural Education

The first aspect we are going to deal with it will be the effects of investments in cultural education on the individual contributions to cultural goods. In this case, we avoid the influence of framing by comparing the levels of contribution to cultural goods coming from T1 and T2 and considering the same framing. Any differences can only be due to the presence of investments in cultural education.

Let us start from the analysis of the data coming from the neutral context treatments. As shown by Fig.1 and Table 2, the contributions to the cultural good from the first treatment (T1NC) are almost always higher than the ones from stage II of the second treatment (T2NC), which enables individuals to invest in cultural education. In order to test for the significance of this difference, we implement the non-parametric Mann-Whitney U test. The value we obtain from this test shows that the variations are significant ($p=0.009$) [6]. However, our previsions have not been confirmed and, moreover, have been subverted by the experimental data. In fact, we were expecting to see a higher level of contributions, on average, to the cultural good when the subjects have the opportunity to invest in cultural education than when this possibility is not available. It seems like subjects have not noticed the eventual positive effect for the whole group coming from investments in cultural education. In particular, in the neutral context treatments, there cannot have been any influences from the framing on the individual contributions to cultural good. We think that subjects have interpreted cultural education as an eventual alternative choice to the contribution to the cultural good. Another possible explanation can be given in terms of discouraged attempts at kindness and/or efficiency. In other words, "potential" cooperators may decrease constantly their contributions because of the lack of cooperation of the other group members. Anyway, they do not catch the opportunity to internalise the positive externality for the whole group allocating their initial endowment to the cultural education before contributing to the cultural good.

[6] We have always used 5 independent observations to compute the Mann-Whitney U test, except when we tested the first period data where we can use 20 independent observations.

In order to verify more deeply this result, we have run the same test considering the data coming from the first period of observation and then considering only the last period's data. In the first case, every single contribution choice represents an independent observation because it has been taken along the first period of the experiment when no influence can affect the choices. The test confirms the significance of the difference in contribution levels to the cultural good between the two treatments ($p = 0.020$)[7], reaching higher levels in T1NC. Considering the second case, we cannot use the same amount of data but we have to adopt the average groups' contributions during the last period. Also in this circumstance, the test is showing the presence of significant differences ($p = 0.016$), achieving higher levels of contribution to the cultural good in T1NC. Therefore, comparing the levels of contributions to the cultural good, when the neutral context is implemented, there are significant variations between the two treatments.

If we examine the case of the cultural context, we notice that the Mann-Whitney U test does not show the presence of any significant difference between the levels of contribution to the cultural good achieved in the first treatment and in the second stage of the second treatment ($p = 0.602$). This means that the possibility of investing in cultural education, in the second treatment, has not influenced subjects' decisions. Also in this case, we have checked for differences in the contributions in the first and last period of the treatment. The results from the test regarding both of the first period ($p = 0.087$) and the last period ($p = 0.346$) confirm the whole trend not eliciting any significant variations.

As shown by Fig.1, although not statistically significant, there are some differences in the patterns followed by the contributions made in the two treatments. First of all, it is worth noticing that the levels referring to T2CC are higher than the ones from T1CC in each of the last four periods. It may be interpreted as the effect of the investment in cultural education being able to boost the contributions to the cultural good. Moreover, the presence of this effect in the last four periods is showing the interval of time necessary either to understand and learn the role of

[7] All the p-values represent the results of 2-tailed Mann-Whitney U tests.

investment in cultural education or to reciprocate to attempts at kindness (Andreoni, 1995b). Second, although always below the contribution levels of T2CC from period 8 onward, Fig.1 shows an unusual increase in the contributions of T1CC. This increase in contribution has been noticed in four groups of subjects out of five contrasting the well-known end-effect observed in the other cases.

At this point, we want to verify the presence of a relationship between the individual and the group contributions in treatment 2. To do so, we run a regression having as dependent variable the individual contribution in the second stage of T2 and as independent variables the own contribution in the first stage of T2; the own contribution in the last period of the second stage of T2; the total contribution of the other members of the group in the first stage of T2; the total contribution of the other members of the group in the last period of the second stage of T2. All the data used in the regression are in percentage of endowment. From Table 3, we notice that the only significant variable is the own contribution in the first stage of T2. Removing the least significant independent variables from the regression, we end up always with the same result. Then, the positive sign of the coefficient shows that the more (less) each individual contributes to the cultural education in the first stage, the more (less) he should allocated to the cultural good in the second stage.

If we aggregate the investment decisions in both stages of T2, we can investigate the presence of correlation between the allocations chosen by subjects with high contribution rates[8] regardless of the framing adopted. In particular, we would like to understand if a high contribution rate in stage 1 could drive contribution down or up in stage 2. According to the above classification, only 6 out of 40 subjects can be labelled as "cooperators". Applying the 2-tailed Pearson correlation test on the individual investment decisions, one subject only shows a positive and significant correlation ($p=0.011$), while all the other subjects show correlation levels with mixed signs but never significant. Therefore, we have not found any systematic and significant tendency of "cooperators" to contribute high amounts of endowment in both stages.

[8] We consider a high contribution rate in stage I when it is greater than the 50% of the endowment.

This result may be due to the presence of many low cooperators[9] that have constantly contributed few tokens in both stages. Applying the 2-tailed Pearson correlation test on the individual investment decisions, all low cooperators show a positive and, almost in every cases, significant level of correlation. Doing so, they make the correlation between first and second stage contribution in treatment 2 significant at an aggregate level, even if there is not any systematic and significant tendency of "cooperators" to contribute high amounts of endowment in both stages.

- Table 3 about here -

4.3 The effects of Framing

In this section, we will investigate the effects due to what we call the cultural context. Those effects may be found in both of investments in cultural education and contributions to cultural good across the two contexts characterizing our experiment.

We start from the patterns of the investments in cultural education. The first thing to be noticed is that the values coming from the cultural context are always greater than those of the neutral context after period 4, although they both show the usual decreasing trend. This result seems to be entirely due to the framing effect that has put in evidence the role of the investment in cultural education. Moreover, it is interesting to notice the striking difference in the values of the last period: 31.7% in the case of cultural context and 14.2% in the case of neutral context, as showed by Fig.2. As done in the previous section, we have checked whether those variations were significant through the Mann-Whitney U test ($p = 0.6$) finding that we cannot reject the null hypothesis stating that the two groups of observations have the same distribution.

As done before, we have also checked for significant differences in the first and last period. Regarding the former, there are clearly no significant differences between the two framings ($p = 0.337$). In fact, also graphically, it is possible to see that the values relative to the first period are

[9] We consider a low contribution rate in stage I when it is less than the 30% of the endowment.

very close each other. This observation suggests that the framing is not able to sustain high levels of contribution from the beginning of the experiment.

- Figure 2 about here -

In order to find to a strong increase in the distance between those two lines, we have to look at the last two periods. In fact, subjects seem to need some time to take advantage of the adoption of the cultural framing. This consideration is confirmed by the result of the Mann-Whitney U test when applied to the last period data ($p = 0.036$). In this case, there is a significant difference in the values and we can reject the null hypothesis, stating that the two contexts come from the same distribution. Again graphically, we can notice that the value of cultural education in the cultural context is larger than the one reached in the neutral context. This aspect validates both the effects of framing in the case of the increase in the investments in cultural education when the cultural context is implemented.

On the average, the subjects do not seem to be willing to fully cooperate even if we introduce a different framing which makes clearer and easier the way to choose the most efficient strategy. According to our previsions, having the possibility to make such investments should have helped subjects in both stimulating the efficiency concerns and internalizing the positive externality for their own group originating from both of the investments in cultural education and the cultural good provision. In our experiment, the subjects have caught this intuition just after period 4.

Now, we analyse the effects of framing on the contributions to the cultural good, focusing on the differences between the two treatments in order to avoid the interferences of the investments in cultural education. We start from the results of T1CC and T1NC. As shown in Fig.1, the two lines are both decreasing regardless of the context implemented. In the case of cultural context, the level of contribution starts from a pretty high value (62.5%) and, then, it decreases until period 8 (28.3%). Surprisingly, during the last two periods, the level of contributions increases slightly

above the 30%, contrasting the famous end-game effect. At a first glance it may seem due to the implementation of the cultural context. Anyway, the cultural context contributions to the cultural good are almost always below the level of the neutral context contributions. Therefore, the framing effect does not seem to be able to explain the rise in the last two periods.

All the considerations we have formulated can be tested through the Mann-Whitney U test which confirms that the differences between the two contexts are not significant ($p = 0.347$). This result is also proved both when considering the first period ($p = 0.739$) and the last period of the experiment ($p = 0.389$). In the case of cultural context, even if the instructions have been written such in a way to make clear references to the concepts of cultural good and cultural education, we have not found any significant variations in the contribution levels during the first treatment. These results seem to contrast the common findings of the experimental literature regarding the framing effects showed in the previous sections.

Concluding, we analyse the patterns of contributions to cultural goods in T2. Again referring to Fig.2, the two lines take almost the same values until period 6, showing the usual declining trend. The most interesting feature is the steep increase in the contribution to the cultural good in the case of the cultural context from period 7 onward. In fact, while the neutral context case shows a decreasing trend and a clear end-effect in the contributions, the level of contributions in the cultural context increases, remaining well above the one of the context-free and presenting a light end-effect in the last period only. Thus, the Mann-Whitney U test does not find any significant difference between groups of observations ($p=0.450$). The same can be said when considering the observations coming from the first period only ($p=0.523$). However, if we check for the last two periods of observations, the differences are all significant with $p=0.028$ and $p=0.016$ in periods 9 and 10 respectively.

Therefore, the effect of framing seems to be focused on the last periods of the experiment where the differences in contributions become significant. This behaviour may imply the fact that the kindness motives can be sustained more strongly adopting an in-context experimental setting

than a neutral one. Nevertheless, it seems peculiar that, given such a clear and straight reference to cultural goods in the instructions, the effect of framing starts so late. Further research is required to analyze more in depth the role of framing when a cultural context is implemented.

5. Discussion

The level of cooperation found in all the experiments with public goods still represents an intriguing puzzle for all the researchers in the field. In our experiment, we call for subjects' concerns for efficiency in order to explain the positive levels of contributions to both of cultural education and cultural good. In fact, the Pareto-efficient solution requires the participants to fully contribute to the two public goods in both stages of our experiment. If on the one hand, the subjects show a poor level of free-riding along the four treatments, on the other hand, they do not reach the Pareto efficient level of cooperation. In particular, they remain about half the way between the Nash equilibrium and the full cooperation strategy (see, e.g. Ledyard, 1995; Palfrey and Prisbrey, 1997).

Our experimental results reveal that, most of the times, the levels of contribution to both the cultural education and the cultural good do not show the usual steep decay at the end of the periods. In particular, one treatment does not show any end-effect. Although, the decay of contributions has been at the heart of many works (Isaac and Walker, 1988; Andreoni, 1988; Andreoni, 1995b; Houser and Kurzban, 2002), we will refer to those (the last two) where the authors separate the influence of kindness and confusion on the decisions to contribute to the public good provision. Andreoni (1995b) claims that the decline in cooperation is due to "frustrated attempts at kindness" (p.892), and not to the learning of the Nash strategy. On the same point, Houser and Kurzban (2002) revisit the work of Andreoni (1995) underlining that, in their standard VCM experiment, confusion causes more cooperation in early rounds than in later rounds and that a decrease of the level of confusion can account for all of the cooperation decline.

Our results coming from the VCM treatments shed quite a different light on this problem. In fact, the contributions made in the neutral context remain higher than the ones made in the cultural context. Given that it cannot be entirely due to the framing effect, we may claim that those results come from successful attempts at kindness during the VCM with neutral context. In the case of cultural context, where the data reveals the absence of the end-effect, it may be that the framing has supported the kindness motives until the end of the treatment. The same can be said regarding the two-stage treatments. The levels of contribution to both the cultural education and the cultural good in the cultural context are higher than the ones in the neutral context. Moreover, the decline in cooperation is higher than the one in the VCM treatments. In the neutral context, the implementation of a two-stage game with two public goods has sustained the concerns for efficiency during the first five periods only. The following decline in cooperation may be due to the frustration of other attempts at kindness as shown by Andreoni (1995b). Therefore, our experimental setting seems to support cooperation and efficiency only when a cultural context is adopted. The possibility of investing in cultural education does not appear able to boost the contributions to the cultural good and it seems that the introduction of the chance of exploiting two positive externalities for the group has not properly stressed the subjects' attention to efficiency.

6. Concluding Remarks

The main aim of our work has been to provide an answer to two questions. First, if the possibility of investing a portion of the initial endowment in cultural education may affect the individual levels of contribution to the cultural good. Second, if the adoption of different framing along the experiment may have influenced subjects' contributions.

Considering the first question and focusing on the neutral context framing, the cultural education does not seem to have caused any increase in the contributions to the cultural good. Moreover, the contributions in the standard VCM, which does not include the investments in

cultural education, are always much greater that the ones of the second treatment. This result has subverted our previsions regarding the positive effects of cultural education on the contributions to the cultural good. Differently, in the case of cultural context, we did not find any significant differences in the contribution levels to cultural good. Anyway, it is interesting to notice that the first treatment does not show the common end-effect, most probably because of the peculiar context implemented.

Regarding the second question, our first result shows that a change in the framing did not have any effect either on the investments in cultural education, except in the last period, or on the contributions to the cultural good in the first treatment. In the second treatment, the framing seems to have a strong effect only on the last two periods, while it does not show any significant effect on the rest of the periods. Such an effect appears to be completely due to the adoption of the cultural context although we have to underline the amount of time that subjects have surprisingly required to increase the cooperation. Therefore, it seems that, even if implementing a clear and direct context, such as a cultural one, individuals behaviours are not affected enough by the context so to increase the level of cooperation from the beginning of the experiment. These experimental findings indicate that more attention has to be devoted to both the design of experiments able to avoid the frustration of attempts at kindness through the exploitation of all the positive externality for the group and to the analysis of the still ambiguous role of framing.

References

Abbink, K. and Hennig-Schmidt, H., 2002. Neutral versus loaded instructions in a bribery experiment. University of Nottingham, Mimeo.

Albers,W. and Harstad, R.M., 1991. A framing effect observed in a market game, In Selten, R. (Ed.), Game equilibrium models II. Methods, morals and markets, Springer Publishing Company, New York, pp. 308-336.

Andreoni, J., 1988. Why free ride? Strategies and learning in public goods experiments. Journal of Public Economics 37(3), 291-304.

Andreoni, J., 1990. Impure altruism and donations to public goods: A theory of warm-glow giving. Economic Journal 100, 464-477.

Andreoni, J., 1995a. Warm-glow versus cold-prickle: the effects of positive and negative framing on cooperation in experiments. Quarterly Journal of Economics, 90, 1-21.

Andreoni, J., 1995b. Cooperation in public-goods experiments: kindness or confusion?. American Economic Review, 85(4), 891- 904.
Bagnoli, M. and Lipman, B., 1992. Private provision of public goods can be efficient. Public Choice 74, 59-78.
Bateman, L., Munroe, A., Rhodes, B., Starmer, C. and Sugden, R., 1997a. A test of the theory of reference-dependent preferences. Quarterly Journal of Economics, 112, 479-505.
Bateman, L., Munroe, A., Rhodes, B., Starmer, C. and Sugden, R., 1997b. Does part-whole bias exist? An experimental investigation. Economic Journal, 107, 322-333.
Blaug, M. (ed.), 1976, The economics of the arts, (London, Martin Robinson).
Bohm, P. and Lind, H., 1992. A note on the robustness of a classical framing result. Journal of Economic Psychology 13, 355-361.
Bolton, G.E. and Katok, E., 1995. An experimental test of crowding out hypothesis: the nature of beneficient behavior. Working Paper Series in Management Science, Pennsylvania State University.
Champarnaud, L., Ginsburgh, V. and Michel, P., 2002. Can cultural education crowd out arts subsidization?. CORE Discussion Papers, n° 2002/40.
Cookson, R., 2000. Framing effects in public goods experiments. Experimental Economics 3, 55-79.
Davis, D.D., and Holt, C.A., 1993, Experimental Economics (Princeton University Press, Princeton, NJ).
Druckman, J.N., 2001. Using credible advice to overcome framing effects. The Journal of Law, Economics and Organization 17, 62-82.
Eckel, C.C. and Grossman P.J., 1996. Altruism in anonymus dictator games. Games and Economic Behavior 16, 181-191.
Elliot, C. and Hayward, D.M., 1998. The expanding definition of framing and its particular impact on economic experimentation. Journal of Socio-Economics 27, 229-243.
Fehr, E., Gaechter, S. and Kirchsteiger, G., 1997. Reciprocity as a contract enforcement device. Econometrica 65, 833-860.
Finocchiaro Castro, M. and Mazza, I., 2001. Cultural Capital and Voluntary Provision of Cultural Goods. Paper presented at the 12th ACEI conference, Erasmus University, Rotterdam.
Frey, B.S., 2000, Arts & economics – Analysis & cultural policy (Berlin, Springer).
Fryer, R.G. Jr., 2002. Cultural capital. University of Chicago, Mimeo.
Ginsburgh, V.A. and Menger, P.-M. (eds.), 1996, Economics of the arts – Selected essays (Amsterdam, Elsevier/North Holland).
Hoffman, E., McCabe, K. and Smith, V., 2000. The impact of exchange context and the activation of equity ultimatum games. Experimental Economics 3, 5-9.
Houser D. and Kurzban R., 2002. Revisiting kindness and confusion in public goods experiments. American Economic Review, 92(4), 1062-1069.
Hutter, M. and Rizzo, I. (eds.), 1997, Economic perspectives on cultural heritage, (Basingstoke, MacMillan).
Isaac, R.M. and Walker, J.M., 1988. Group size effects in public goods provision: the voluntary contribution mechanism. Quarterly Journal of Economics, 103(1), 179-200.
Kahneman, D. and Knetsch, J.L., 1992. Valuing public goods: the purchase of moral satisfaction. Journal of Environmental Economics and Management 22, 57-70.
Kashima, Y. and Maher, P., 1995. Framing of decisions under ambiguity. Journal of Behavioral Decision Making, 8, 33-49.
Klamer, A. (ed.), 1996, The Value of culture – On the relationship between economics and arts (Amsterdam, Amsterdam University Press).
Knetsch, J.L., and Sinden, J.A., 1984. Willingness to pay and compensation demanded: experimental evidence of an unexpected disparity in measures of values. Quarterly Journal of Economics 99, 507-521

Ledyard, J.O., 1995. Public Goods: a survey of experimental research, In: Kagel, J.H., Roth, A.E. (Eds.), Handbook of Experimental Economics, Princeton University Press, Princeton, NJ, pp. 111-194.

Levin, I.P., Schneider, S.L. and Gaeth G.J., 1998. All frames are not created equal: a typology and critical analysis of valence framing effects. Organizational Behavior and Human Decision Processes 76, 149-188.

Liebrand, W.B.G., 1984. The effect of social motives, communication and group sizes on behavior in a n-person multi stage mixed motive game. European Journal of Social Psychology 14, 239-264.

Loomes, G., 1999. Some lessons from past experiments and some challenges for the future. The Economic Journal 109, 35-45.

Mazza, I., 1993. A microeconomic analysis of a patronage and sponsorship, In: Peacock, A. e Rizzo, R. (Eds.), Cultural Economics and Cultural Policies, Kluwer Academic Publishers, pp. 35-53.

Mossetto, G., 1993, Aesthetics and Economics (Boston, Kluwer).

Offerman, T., Sonnemans, J. and Schram, A., 1996. Value orientations, expectations, and voluntary contributions in public goods. Economic Journal 106, 817-845.

Palfrey, T.R. and Rosenthal, H., 1988. Private incentives in social dilemmas: the effect of incomplete information and altruism. Journal of Public Economics 35, 309-332.

Palfrey, T.R. and Prisbrey, J.E., 1997. Anomalous behavior in public goods experiments: how much and why?. American Economic Review 87(5), 829-846.

Park, E.-S., 2000. Warm-glow versus cold-prickle: a further experimental study of framing effects on free-riding. Journal of Economic Behavior and Organization 43, 405-421.

Pethig, R. and Cheng S.-W., 2000. Cultural goods consumption and cultural capital. University of Siegen, Mimeo.

Ploeg, R. van der, 2002. In art we trust. De Economist, 150, 335-361.

Potters, J and van Winden, F., 2000. Professionals and students in a lobbying experiment. Professional rules of conduct and subject surrogacy. Journal of Economic Behavior and Organization 43, 499-522.

Sable, K.A. and Kling, R.W., 2001. The double public good: a conceptual framework for “shared experience” values associated with heritage conservation. Journal of Cultural Economics, 25, 77-89.

Scandizzo, P.L., 1992. Cultural goods and economic growth. Ricerche Economiche 46, 91-110.

Schram, A. and Sonnemans, J., 1996. Why people vote: experimental evidence. Journal of Economic Psychology, 17, 417-442.

Sonnemans, J., Schram, A, and Offerman, T. 1998. Public good provision and public bad prevention: the effect of framing. Journal of Economic Behavior and Organization **7**, 47-70.

Throsby, D., 1994. The production and consumption of the arts: a view of cultural economics. Journal of Economic Literature 32, 1-29.

Throsby, D., 1999. Cultural capital. Journal of Cultural Economics 23, 3-12.

Throsby, D., 2001, Economics and Culture (Cambridge University Press).

Towse, R. (ed,), 1997, Cultural economics: the arts, the heritage and the media industries, (Cheltenham, Edward Elgar).

Trimarchi, M., 1993, Economia e Cultura. Organizzazione e Finanziamento delle Istituzioni Culturali (Angeli Editore).

Tversky, A and Kahneman, D, 1981. The framing of decisions and the psychology of choice. The Science, 211, 453-458.

Willinger, M. and Ziegelmeyer, A., 1999. Framing and cooperation in public good games: an experiment with an interior solution. Economic Letters 65, 323-328.

Wording adopted in the treatments

Neutral Context	**Cultural Context**	**Stage**
Project A	"private good"	Stage II
Project B	"cultural good"	Stage II
Project C	"investment in cultural education"	Stage I
Project D	"Saving tokens to phase II"	Stage I

Table 1

Percentage of Endowment Contributed to the Cultural Good and Cultural Education per Period

Period		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*Average*
Treatment 1 - Neutral Context	Cultural Good	62,5	54,2	56,7	55,8	46,7	52,5	49,2	46,7	40,8	39,2	50,4
Treatment 1 – Cultural Context	Cultural Good	61,7	63,3	51,7	35,8	47,5	47,5	38,3	28,3	30,0	33,3	43,7
Treatment 2 – Neutral Context	Cultural Education	46,7	43,3	51,7	47,5	30,0	29,2	17,5	22,5	23,3	14,2	32,6
	Cultural Good	45,7	41,3	47,4	46,1	41,9	31,7	24,3	23,0	25,5	16,5	34,3
Treatment 2 – Cultural Context	Cultural Education	40,8	37,5	40,8	45,8	46,7	30,0	31,7	26,7	40,8	31,7	37,3
	Cultural Good	48,4	38,4	40,8	39,8	45,2	29,4	40,1	35,4	45,5	42,5	40,6

Table 2

Regression (Dependent Variable: Stage2C)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	15,113	10,502		1,439	,159
OwnStage1C	,628	,196	,653	3,208	,003
OwnlastpS2C	-,045	,107	-,085	-,415	,680
OthersS1C	,078	,348	,040	,224	,824
OtherslastpS2C	-,017	,154	-,020	-,109	,914

Table 3

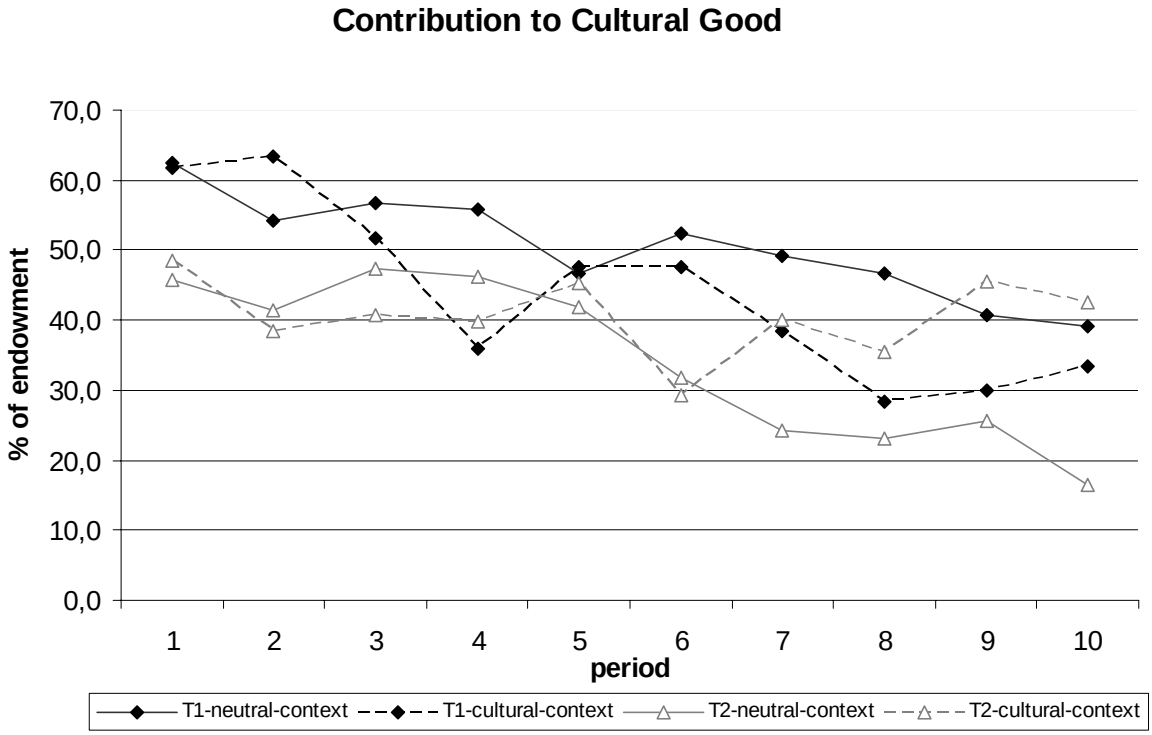

Figure 1

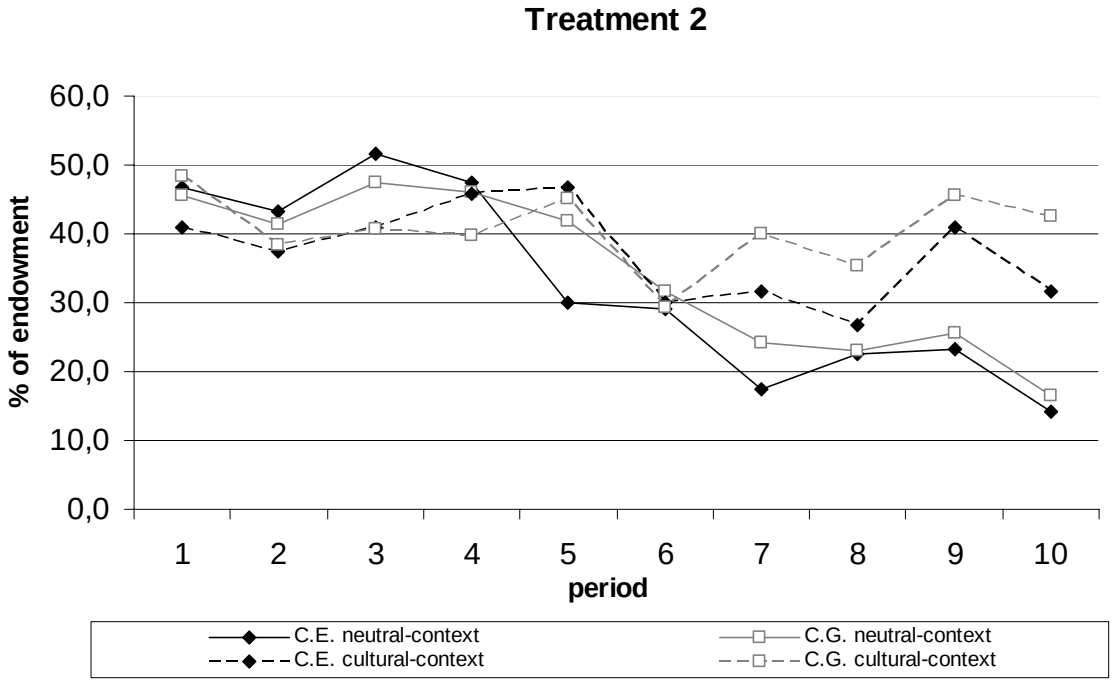

Figure 2