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## The Effects of Induced Emotions on Leading-by-Example

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## The Effects of Induced Emotions on Leading-by-Example

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# The Effects of Induced Emotions on Leading-by-Example

## Abstract

This paper investigates the effects of induced emotions on leading-by example. Using an online sample of more than 1,000 participants, we observe behavior in a one-shot sequential voluntary contribution mechanism game where leaders and followers are induced to be either happy or angry. Our findings show that angry leaders contribute less than happy leaders. The same effect is observed when considering followers' behavior. Crucially, controlling for leaders' contributions, the mood effects on followers' behavior disappear, implying that it is sufficient to induce emotions only on leaders in order to affect followers' behaviour. Our findings further highlight the role of emotions as a causal force, suggesting that negative changes in well-being can bring about adverse effects on team cooperation.

JEL-Codes: C920, D070, H410.

Keywords: induced emotions, anger, happiness, contribution, leading-by-example.

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## 1. Introduction

Since the COVID-19 pandemic, the well-being of employees has become a key item in the agenda of HR leaders and managers. According to a recent survey by the American Psychological Association, 92% of workers reported that it is very or somewhat important for them to work for an organization that values their emotional and psychological well-being.<sup>1</sup> The U.S. Surgeon General's Framework for Workplace Mental Health and Well-Being outlines five key dimensions that are deemed necessary to promote well-being in the workplace and emphasizes the crucial role that workplaces should play in protecting their workers' well-being. Therefore, deepening our understanding of the causal effects that emotional well-being may have on aspects of workplace behavior is of utmost importance for managerial policy making in modern corporations. Our paper contributes towards this direction by uncovering the causal impact induced emotions have on a key aspect of managerial decision-making: leading-by-example.

In psychology, there is a long tradition in investigating moods and emotions suggesting that humans often make different decisions depending on their current feeling states due to the use of different processing strategies (Bless *et al.* 1996; Schwarz and Clore, 1996), cognitive capacities (Isen, 1987; Mackie and Worth, 1989) or mood maintenance motivations (Isen, 1987; Wegener *et al.*, 1995).<sup>2</sup> By contrast, the role of emotions has been largely neglected in traditional economic decision-making theories. Standard economic theories assume economic agents to be fully-rational, self-interested, emotionless maximizers of expected utility. This consequentialist framework does not need to be devoid of emotions as one could incorporate expected emotions that are anticipated to occur as the result of the outcomes of different choices into a theoretical model. However, expected emotions are not the only channel through which emotions can affect choices (see Rick and Loewenstein, 2008). Immediate emotions, experienced at the moment of choice, are a bigger challenge to the consequentialist framework and have received less attention.

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<sup>1</sup> Accessed at: <https://www.apa.org/pubs/reports/work-in-america>

<sup>2</sup> Psychologists usually make a distinction between moods (which are typically long-lasting states) and emotions (which are typically short-lived states). They also used the term "affect" which normally encapsulates both emotions and moods (Forgas, 1992). Yet, in this paper, we are not concerned with making such a distinction and therefore use these terms interchangeably. It is also worth noting that the procedures used to induce moods and emotions are practically the same (for a brief discussion, see Fredrickson, 2005).

Taking advantage of the experimental methodology, we report a study that exogenously manipulates emotional states – happiness and anger – and quantifies their causal effects on teamwork using a leader-follower paradigm. Our focus is on leading-by-example – a leadership style in which the leader models and guides followers’ behavior – which has been widely investigated in teamwork settings where strong financial free-riding incentives are present (see Ch. 6 in Drouvelis, 2021). A growing experimental literature has studied leadership by example in social dilemma games (e.g. Rivas and Sutter 2011, Drouvelis and Nosenzo 2013, Sahin et al. 2015, Cappelen et al. 2016, Gächter and Renner 2018). As is typical in voluntary contributions game experiments, followers’ contributions exhibit a pattern of conditional cooperation: followers tend to contribute little when the leader sets a poor example with low contributions to the group project, while they contribute significantly more when the leader is a high contributor (e.g., Güth et al. 2007; Figuières et al. 2012; Gächter et al. 2012; see also Eichenseer, 2023; Eisenkopf and Kölpin, 2024 for an overview). Despite this conditional response, there is little evidence that leadership by itself enhances cooperation (e.g. Rivas and Sutter 2011, Sahin et al. 2015, see also Figuières et al. 2012).<sup>3</sup> This raises the intriguing and fundamentally important question of which behavioural determinants can shape the relationship between leaders and followers.

We shed empirical light on the causal link between immediate (induced) emotions and behaviour in sequential social dilemma games. This mixed-motive paradigm captures the tension between personal interest and social benefit which characterizes many real-life social dilemmas and teamwork environments in the workplace. In their very nature, such dilemmas are loaded with emotions. Early literature has offered evidence showing that emotions can explain pro-social behavior in social dilemma games (see Charness and Grosskopf, 2001; Hopfensitz and Reuben, 2009; Cubitt *et al.*, 2011; Joffily *et al.*, 2014 Dickinson and Masclet, 2015). More recently, and closer to our setting, experimental evidence examines whether and if so, how induced emotions drive behavior in cooperation games. For instance, Drouvelis and Grosskopf (2016) show that angry mood individuals contribute less than happy mood individuals in simultaneous social dilemma games. Consonant with this finding, Bartke et al. (2019),

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<sup>3</sup> Only if leaders are endogenously determined (Haigner and Wakolbinger 2010, Rivas and Sutter 2011, Cappelen et al. 2016), have status (Kumru and Vesterlund 2010, Jack and Recalde 2015), can communicate with followers (Boulu-Reshef et al. 2020, Eisenkopf 2020), or have some power such as the right to exclude (Güth et al. 2007) does leadership appear to substantially increase efficiency.

and Nguyen and Noussair (2022) find that anger reduces cooperation. However, how induced emotions shape leading-by-example still remains unexplored.

The most appropriate way of analyzing immediate emotions is to experimentally manipulate emotions by inducing them. We concentrate on two emotional states: anger and happiness. Anger is classified as one of the six so-called “primary or universal” emotions (see Damasio, 1994)<sup>4</sup> and psychology research associates anger with expressions of unfair behavior (e.g., Anderson and Bushman, 2002; van Kleef, 2010). Anger is also one of the most frequently experienced emotions in the workplace (Fitness, 2000), further motivating us to quantify its causal impact on leadership. On the other hand, happiness has long been of interest to economists (for overviews, see Lane, 2017 and Ifcher et al., 2021). A growing literature shows that happiness results from pro-social behavior using both observational (e.g., Bjørnskov, 2003; Rodríguez-Pose and von Berlepsch, 2014) and experimental data (e.g., Konow and Earley, 2008; Becchetti and degli Antoni, 2010). Our study considers happiness as a natural baseline to which the effects of induced anger can be compared. Our choice of emotions is also motivated by Drouvelis and Grosskopf (2016) and thus our evaluation of anger and happiness makes our study more comparable to theirs.

In our paper, we borrow techniques from social psychology and induce the emotions of happiness and anger by showing short video clips to participants before they make their contribution decisions. Subjects are randomly allocated in one of two treatments depending on whether they were induced to be happy (“Happy” treatment) or angry (“Angry” treatment). Following the mood induction phase, subjects are asked to make their decisions in our leading-by-example paradigm which is based on a sequential version of the voluntary contribution mechanism (VCM) game. In the game players decide how much to contribute to a group project. The project yields positive returns to all group members irrespective of the amount contributed. Contributions are made sequentially. In particular, one group member (the “leader”) makes her contribution before the other group members (the “followers”) contribute. The game is parameterized such that not contributing maximizes individual earnings, whereas joint earnings are maximized when members contribute fully (see design section for more details).

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<sup>4</sup> The other five such emotions are happiness, sadness, fear, surprise and disgust.

Our main findings indicate that induced emotions play a significant role in shaping leadership-followership behavior in our sequential VCM game. In particular, angry leaders contribute significantly less than happy leaders. The same effect is observed when considering followers' behavior. In our analysis, we distinguish whether the observed effects on followers' behaviors are due to induced emotions or leaders' behavior. We find that, controlling for leaders' behavior, the mood induction effect on followers' behavior disappears, suggesting that it is sufficient to induce moods on leaders in order to affect followers' behavior. Our findings further highlight the key role of emotions as a causal force that can affect important aspects of organizational and managerial environments. We discuss policy implications and how our study broadens the existing literature later in the paper.

Our paper is organised as follows. Section 2 outlines the experimental design and procedures. Section 3 states the hypotheses and Section 4 presents the experimental results. Section 5 discusses our findings and concludes.

## **2. Experimental design and procedures**

### *2.1 Sequential voluntary contribution mechanism*

Our experimental design centres on a sequential VCM game. Subjects randomly form groups of 12 subjects. Each group member is endowed with 20 tokens that they can keep or contribute to a public account (described to subjects as project). Let  $0 \leq c_i \leq 20$  denote the contribution of group member  $i$ . The payoff of member  $i$  is computed as:

$$\pi_i = 20 - c_i + 0.5 \cdot \sum_{j=1}^{12} c_j \quad (1)$$

The marginal per capita return of 0.5 means that each token member  $i$  contributes to the public account yields a return to each of the twelve group members of 0.5. This creates the social dilemma in that subject  $i$  does not directly gain from contributing (she contributes 1 and gets back 0.5) but the group benefits from her contributing (she contributes 1 and the group as a whole get back 6). The most efficient outcome is for all twelve group members to contribute 20. This yields a payoff of 120 for each group member (compared to the initial endowment of 20).

Contributions to the public account are made sequentially, meaning that one member of the group is randomly assigned the role of leader who makes her



contribution decision first.<sup>5</sup> The remaining eleven group members are assigned the role of follower and decide on their contributions to the public good independently and simultaneously, after observing the leader's contribution.<sup>6</sup> Subjects played a one-shot voluntary contributions game under one of two treatments, described below.

## 2.2 Treatments

Our between-subjects design consists of two treatments in which we exogenously vary subjects' emotions; we either induce them to be *happy* or *angry*. We induce emotions by exposing subjects to scenes from short video clips. There is a large body of literature in psychology on mood induction procedures. These, for example, include the imagination of emotionally driven events, the use of emotional statements whereby subjects are asked to try and feel the associated mood, the presentation of mood-suggestive stories, video clips and music, the receipt of positive/negative feedback on task performance, the exposition of certain social interactions, the exchange of gifts and the use of different facial expressions.<sup>7</sup> The motivation for using video clips as our mood-generating process stems from psychological studies suggesting that short films have one of the highest success rates in inducing moods in laboratory experiments and that they minimise experimenter demand effects (e.g. Clark, 1983; Martin, 1990).<sup>8</sup>

For the "Happy" treatment, our aim was to induce the emotion of happiness. For this purpose, we showed subjects a short video clip from the movie "When Harry met Sally" (filmed in 1989), in particular, the scene where the main characters of the film – Sally (played by Meg Ryan) and Harry (played by Billy Crystal) – discuss in a café that women fake orgasms all the time, and men simply can't tell. For the "Angry" treatment, our aim was to induce the emotion of anger. In this case, we showed subjects a short video from the movie "My Bodyguard" (filmed in 1980) where a young boy comes to

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<sup>5</sup> We also elicited first order and second order beliefs about others' contributions (FOB and SOB, respectively) both for leaders and followers. Beliefs elicitation was incentivised. We include FOB and SOB as additional controls in our data analysis.

<sup>6</sup> In the experiment Leaders were labeled "First Movers" and Followers "Second Movers". Instructions used in the experiment are available in Appendix A.

<sup>7</sup> For a meta-analysis of these procedures, see Westermann *et al.* (1996).

<sup>8</sup> To reduce the presence of potential demand characteristics, we also avoided the use of accompanying instructions and cover stories for the video clips.

a new school and gets harassed by a bully.<sup>9</sup> After mood induction had taken place, subjects were given a list of thirteen emotions. They were asked to indicate the intensity with which they felt each emotion. The intensity for each emotion was recorded on a 9-point scale (1 = “not at all”, ..., 9 = “very much”). To control for initial levels of emotions, we elicited emotions twice: once at the very beginning of the experiment and then, after subjects had watched the corresponding video clip, depending on the treatment.

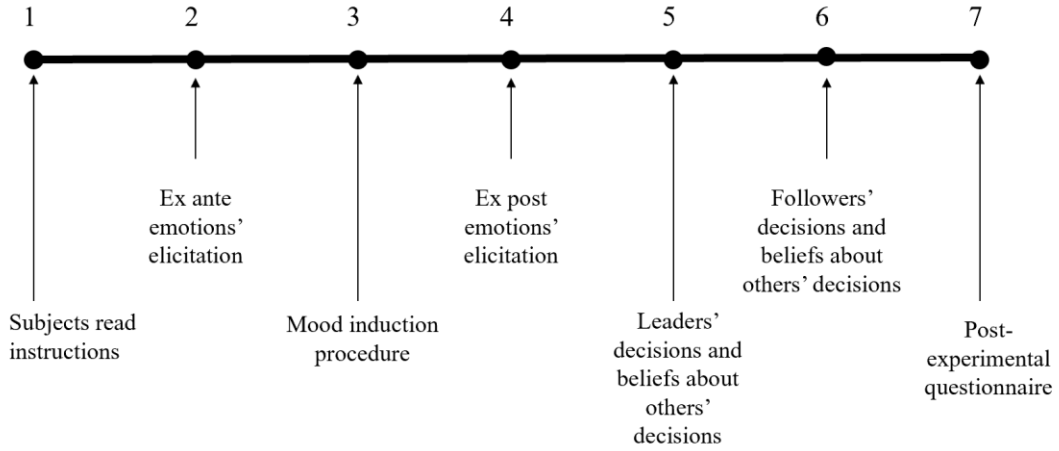
### 2.3 Recruitment and procedures

In total, we collected 1,011 observations: 509 observations for the “Happy” treatment and 502 observations for the “Angry” treatment. All subjects were recruited online through Prolific, and the experiment was computerized and programmed with the software, o-Tree (Chen, et al., 2016). As a show-up fee, subjects were paid £1 and, in addition to this, they were told that they could earn an extra bonus payment depending on the decisions they and other group members make during the experiment, using an exchange rate of £0.01 per point. Average earnings (including a show-up fee of £1) were £1.72. Sessions lasted no more than 10 minutes. At the end of the experiment, subjects completed a short post-experimental questionnaire eliciting basic demographic and attitudinal information. This included a self-assessment of subjects’ risk and trust attitudes. Risk attitudes were elicited using the SOEP general risk question discussed in Dohmen et al. (2011). The question reads: “*Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?*”, and subjects answered on a scale from 0 (“*risk averse*”) to 10 (“*fully prepared to take risk*”). Trust attitudes were elicited using the WVS Trust question (“*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*”), to which subjects replied either by saying that they believe that “*most people can be trusted*” or that one needs “*to be very careful in dealing with people*”. The timeline of the experiment is shown in Figure 1.

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<sup>9</sup> Previous research has established the emotional effects of both video clips we used in our mood induction phase. For a classification of movies which induce particular emotions, see Gross and Levenson (1995).

**Figure 1.** Timeline of the experiment



To formally test whether subjects' gender, trust, risk and instructions' comprehension are balanced across treatments, we conduct balance checks, the results of which are reported in Table 1. The average values of each demographic characteristic across treatments (along with the corresponding standard deviations for each treatment) are shown in columns 1–2. In columns 3–6, we present such information split by subjects' roles in the experiment (leaders and followers). In the last three columns, we perform two-sided Mann–Whitney tests to check whether there are pairwise treatment differences for each of our four variables across treatments, and we do not find evidence that this is the case ( $p > 0.155$ ).

**Table 1. Subjects' descriptive statistics across treatments**

Variables	Happy treatment (N=509)	Angry treatment (N=502)	Happy leaders (N=45)	Angry leaders (N=46)	Happy followers (N=464)	Angry followers (N=456)	Happy treatment vs Angry treatment	Happy leaders vs Angry leaders	Happy followers vs Angry followers
Gender (=1 if Female)	0.53 (0.50)	0.51 (0.50)	0.57 (0.50)	0.49 (0.51)	0.52 (0.50)	0.51 (0.50)	0.554	0.592	0.698
Age	40.81 (14.18)	41.07 (13.63)	37.64 (12.98)	39.46 (12.13)	41.11 (14.27)	41.23 (13.77)	0.547	0.359	0.676
Trust (=1 if careful)	0.53 (0.50)	0.51 (0.50)	0.49 (0.51)	0.48 (0.51)	0.54 (0.50)	0.51 (0.50)	0.366	1.000	0.362
Risk	5.16 (2.30)	4.99 (2.34)	5.40 (2.62)	5.46 (2.01)	5.14 (2.27)	4.95 (2.36)	0.188	0.929	0.155
Instructions	3.75 (0.88)	3.82 (0.90)	3.73 (0.96)	3.85 (0.82)	3.75 (0.87)	3.81 (0.91)	0.183	0.714	0.210

*Note: Standard deviations in parentheses. The last three columns report p-values of two-sided Mann-Whitney tests.*

### 3. Hypotheses

The following hypotheses address the impact of induced anger and happiness on contribution behavior in our sequential VCM game. Our null hypothesis is that our mood manipulation has no effect on contribution levels. However, existing laboratory evidence (e.g., Capra, 2004; Kirchsteiger *et al.*, 2006; Capra *et al.*, 2010) shows that subjects who are in a negative mood exhibit less altruistic or helpful behavior. More related to our context, previous evidence shows that induced moods affect contribution in simultaneous VCM games. For example, Drouvelis and Grosskopf (2016) find that angry mood individuals contribute less than happy mood individuals. Consonant with this finding, Bartke *et al.* (2019) and Nguyen and Noussair (2022) also show that anger leads to lower cooperation. In addition to existing evidence from economics experiments, we also draw on psychological literature to formulate our alternative hypothesis. The Affective Generalization Hypothesis proposed by Johnson and Tversky (1983) posits that individuals under a negative emotional state will have more pessimistic beliefs than those under a more positive emotional state. Coupled with mounting evidence on conditional cooperation from economics experiments (for an overview, see Drouvelis, 2021), an alternative hypothesis would be to observe lower cooperation among individuals in the “Angry” compared to the “Happy” treatment. Further, past research in psychology has associated anger with aggression, defined as behavior that is performed to cause harm towards another individual (e.g., Anderson and Bushman, 2002; van Kleef, 2010), as well as with perceived injustice that can cause retaliation against another part (e.g., Baron *et al.*, 1999; Barclay *et al.*, 2005) – acts that are considered to be highly uncooperative. These hypothesised effects of anger are consistent with Motro *et al.* (2016) who offers evidence showing that anger reduces cooperation. Taken together, existing conceptual frameworks as well as evidence from previous economics and psychology research leads us to formulate our alternative hypothesis.

***Hypothesis 1:*** *Subjects in an angry mood cooperate less than subjects in a happy mood.*

## 4. Results

### 4.1 Mood induction

This section presents the findings from the mood induction procedure. Recall that in the “Happy” treatment, we wanted to induce the emotion of *happiness*; whereas, in the “Angry” treatment, we wanted to induce the emotion of *anger*. Our analysis is therefore centred on the examination of these two emotions. We elicited emotions twice (before and after the video clip was shown) and recorded intensities of emotions on a scale from 1 (“no intensity at all”) – 9 (“highest possible intensity”). Table 2 reports the average happiness and anger across treatments and roles (leaders and followers).<sup>10</sup>

**Table 2. Average self-reported happiness and anger**

Treatments and roles	Happiness before	Anger before	Happiness after	Anger after	Happiness before vs after	Anger before vs after
Happy treatment (N=509)	5.27 (1.85)	1.74 (1.32)	5.38 (2.01)	1.54 (1.10)	0.126	0.000
Angry treatment (N=502)	5.33 (2.04)	1.75 (1.40)	2.71 (1.81)	5.15 (2.61)	0.000	0.000
Happy leaders (N=45)	5.29 (1.70)	1.89 (1.67)	5.44 (1.96)	1.51 (1.06)	0.191	0.026
Happy followers (N=464)	5.27 (1.86)	1.72 (1.28)	5.37 (2.02)	1.54 (1.10)	0.238	0.000
Angry leaders (N=46)	5.54 (1.70)	1.87 (1.38)	2.87 (1.81)	5.17 (2.66)	0.000	0.000
Angry followers (N=456)	5.31 (2.08)	1.74 (1.40)	2.69 (1.81)	5.15 (2.61)	0.000	0.000

*Note: Standard deviations in parentheses. The intensity of emotions was recorded on a 9-point scale (1 = “not at all”, ..., 9 = “very much”). The last two columns report p-values of two-sided Wilcoxon signed-rank tests.*

<sup>10</sup> In Appendix B Figures B.1-B.13, we present the distribution of all thirteen emotions (before and after the video clip was shown) across treatments. As in studies involving induced emotions, it is generally challenging to evoke a single, isolated emotional response, as various emotions often correlate with one another (e.g., happiness and joy, sadness and anger).

Prior to mood induction, we observe that subjects self-report similar emotions of happiness and anger (for happiness:  $p = 0.662$  for all subjects;  $p = 0.413$  for leaders; and  $p = 0.299$  for followers and for anger:  $p = 0.850$  for all subjects;  $p = 0.664$  for leaders; and  $p = 0.672$  for followers). Evaluating our mood induction procedure, we find that, in the “Happy” treatment, subjects report higher levels of happiness but not to a significant extent ( $p > 0.126$ ). Turning to the emotion of anger, we find that subjects, in the “Anger” treatment, become significantly angrier after they have watched the video clip ( $p < 0.001$ ). Overall, our analysis shows that subjects in the “Anger” treatment become significantly angrier than subjects in the “Happy” treatment. Thus, we can assess the effects of anger on behavior by comparing the two treatments.

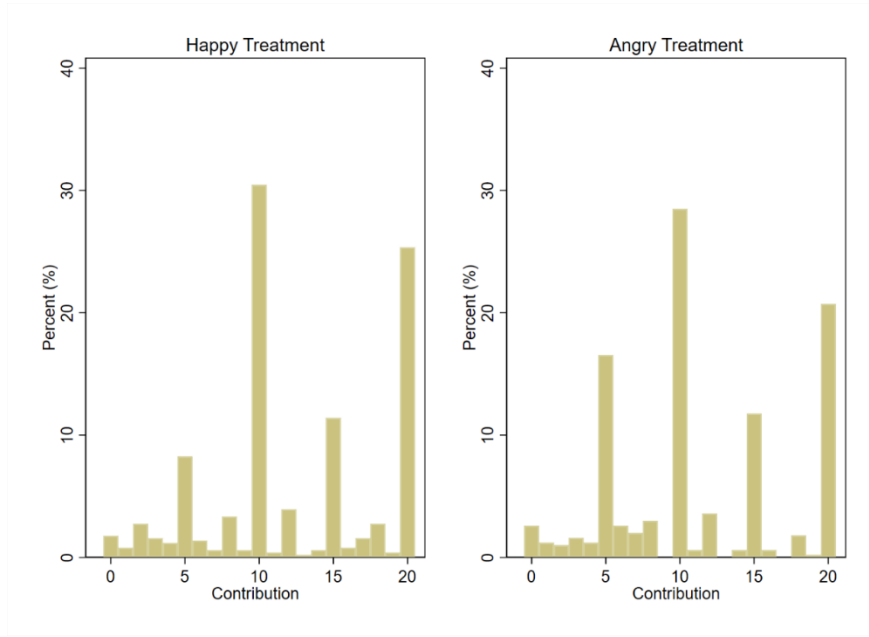
In the following sections, we explore whether these temporary changes in subjects’ moods bring about differences in their contribution behavior.

## *4.2 Contribution behavior*

### *4.2.1 Aggregate behavior*

Figure 2 shows the distribution of individual contributions in each of the two treatments. On average, subjects contribute 12.42 tokens (s.d.=5.80) in the “Happy” treatment and 11.28 tokens (s.d.=5.84) in the “Anger” treatment. Using a two-sided Mann-Whitney test, we find that subjects contribute significantly less in the “Anger” compared to the “Happy” treatment ( $p = 0.002$ ). This finding provides evidence in favor of Hypothesis 1.

**Figure 2.** Distribution of individual contributions across treatments



We further explore the determinants of contribution behavior by performing Tobit regressions as contributions are restricted to take on values between 0 and 20. We report the results of three models in Table 3. In all models, the dependent variable is the amount of tokens a subject contributes to the public good. Model (1) directly tests for treatment differences by including as explanatory variable a treatment dummy variables called “Angry” (which equals 1 for the “Angry” treatment and 0 otherwise). In addition, Model (2) controls for first and second order beliefs and Model (3) is augmented by including control variables such as a subject’s gender, age, trust on others, risk level and understanding of instructions, explained above. Our regression results are reported in Table 3.<sup>11</sup>

**Table 3. Determinants of contribution behavior – Regression results**

Dependent variable: Contribution to public good by subject i			
	(1)	(2)	(3)
Angry	-1.42*** (0.50)	-1.30*** (0.46)	-1.36*** (0.46)
FOB		0.70*** (0.05)	0.69*** (0.04)
SOB		0.20*** (0.06)	0.20*** (0.06)

<sup>11</sup> The reduced sample size in Model (3) is due to missing values in the demographic variable for gender, as we excluded participants who selected “Other” in response to the question, “What is your gender?”



Controls?	No	No	Yes
Constant	13.41*** (0.38)	6.45*** (0.51)	7.07*** (1.35)
Obs.	1011	1011	1001

*Note: Tobit regression estimates. The variable “Angry” is a dummy variable, which takes on the value of “1” for the angry treatment and “0” for the happy treatment. The variable “FOB” is the first order belief. The variable “SOB” is the second order belief. Robust standard errors clustered at the group level are given in parentheses. Demographics include a subject’s gender, age, trust, risk and understanding of instructions. Significant differences are shown using \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .*

Table 3 confirms the main findings from the non-parametric analysis. Specifically, we find that the coefficients “Angry” across all models are negative and statistically significant. In addition, we find that first and second order beliefs positively correlate with contribution, a finding commonly identified in VCM games which can be interpreted as evidence of conditional cooperation.<sup>12</sup>

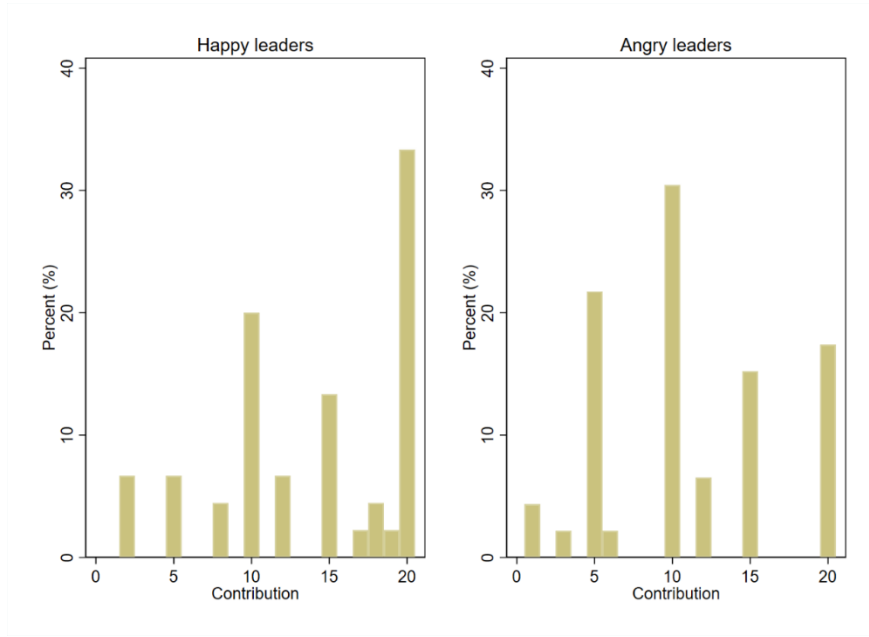
**RESULT 1.** *Subjects contribute significantly less in the “Angry” treatment than in the “Happy” treatment.*

#### 4.2.2 Leader’s behavior

Figure 3 shows the distribution of leaders’ contributions across treatments. Turning to average leaders’ contribution levels, we find that subjects contribute 13.89 tokens (s.d.=5.87) in the “Happy” treatment and 10.91 tokens (s.d.=5.63) in the “Anger” treatment. Using a two-sided Mann-Whitney test, we conclude that angry leaders contribute significantly less than happy leaders ( $p = 0.019$ ). This finding provides evidence in favor of Hypothesis 1.

<sup>12</sup> As shown in Figure B.1-B.13 and as is commonly observed in studies using emotion induction, multiple emotions are typically triggered. To account for the effects of more complex emotional responses, we construct two mood indices: a “positive index” and a “negative index.” These indices are derived using factor analysis on all thirteen elicited emotions. This approach allows us to capture “less happy” subjects in the “Happy” treatment and “happier” subjects in the “Angry” treatment, enabling us to draw broader conclusions that are not dependent on a specific movie. Including these indices separately yields similar results to using treatment dummies (see Tables B.1-B.3).

**Figure 3.** Distribution of leaders' contributions across treatments



We further explore the determinants of leaders' contribution behavior by performing Tobit regressions. The interpretation of the dependent and independent variables follows the same reasoning as the ones reported in Table 3. Our findings are also similar to the ones reported in Table 3. The coefficients "Angry" across all models remain negative and statistically significant, implying that happy leaders contribute more than angry leaders. In addition, first and second order beliefs are positively correlated with contribution behavior, similar to what we observed earlier.

**Table 4. Determinants of leaders' contribution behavior — Regression results**

Dependent variable: Contribution to public good by subject i			
	(1)	(2)	(3)
Angry	-3.82** (1.60)	-2.77** (1.38)	-3.13** (1.37)
FOB		0.47*** (0.15)	0.40** (0.16)
SOB		0.36*** (0.10)	0.40*** (0.12)
Controls?	No	No	Yes
Constant	15.36*** (1.29)	9.10*** (1.60)	4.04 (4.69)
Obs.	91	91	89

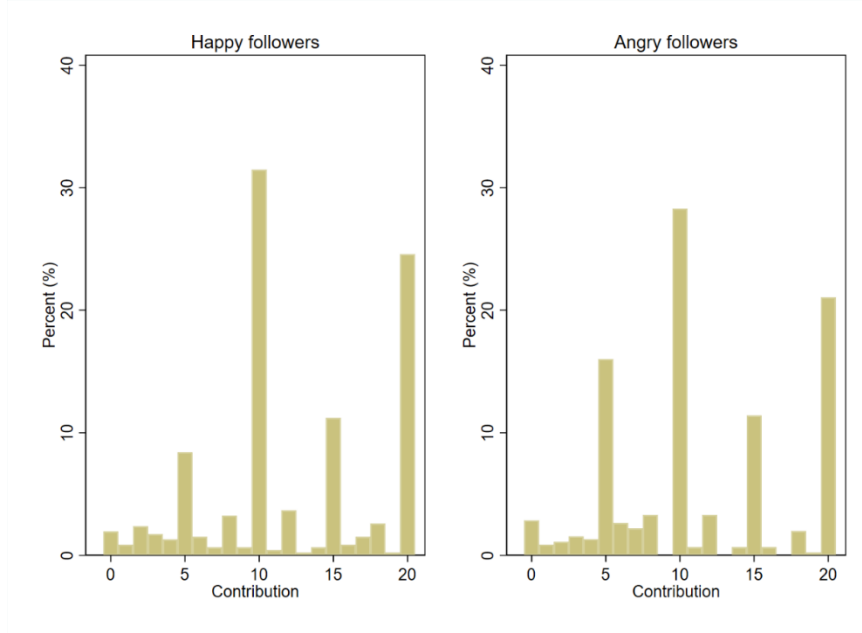
*Note: Tobit regression estimates. The variable "Angry" is a dummy variable, which takes on the value of "1" for the angry leaders and "0" for the happy leaders. The variable "FOB" is the first order belief for leaders. The variable "SOB" is the second order belief for leaders. Robust standard errors clustered at the group level are given in parentheses. Demographics include a subject's gender, age, trust, risk and understanding of instructions. Significant differences are shown using \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .*

**RESULT 2.** *Leaders contribute significantly less in the “Angry” treatment than in the “Happy” treatment.*

#### 4.2.3 Followers’ behavior

Figure 4 shows the distribution of followers’ contributions across treatments. Turning to average followers’ contribution levels across treatments, we find that happy followers contribute 12.28 tokens (s.d.=5.78); whereas, angry followers contribute 11.32 tokens (s.d.=5.87). A two-sided Mann-Whitney test yields a statistically significant difference across treatments: angry followers contribute significantly less than happy followers ( $p = 0.010$ ).

**Figure 4.** Distribution of followers’ contributions across treatments



We further explore the determinants of followers’ contribution behavior by performing Tobit regressions. This allows us to distinguish between two possible mechanisms that might affect followers’ behavior: i) the effect of the induced emotions and ii) the effects from the leaders’ contribution. In other words, angry followers may contribute less than happy followers either because they have watched the angry video (mood induction effect) or because they have observed the leaders’ contribution whose behavior is due to the mood induction (leaders’ behavior effect). To disentangle these

two effects, we report regression models where we control for leaders' contribution behavior and check whether treatment effects are robust. In particular, Model (1) only includes a dummy variable called "Angry". In Model (2), we include first and second order beliefs while Model (3) is augmented by additional controls for robustness. The remaining three models control for leaders' contribution (Model (4)) and are augmented with first and second order beliefs (Model (5)) as well as controls (Model (6)). Our regression results are reported in Table 5.

**Table 5. Determinants of followers' contribution behavior — Regression results**

Dependent variable: Contribution to public good by subject i						
	(1)	(2)	(3)	(4)	(5)	(6)
Angry	-1.19** (0.55)	-1.21** (0.48)	-1.29*** (0.48)	0.30 (0.51)	0.22 (0.44)	0.14 (0.43)
Leader's contribution				0.51*** (0.05)	0.48*** (0.04)	0.48*** (0.04)
FOB		0.72*** (0.04)	0.71*** (0.04)		0.69*** (0.04)	0.68*** (0.04)
SOB		0.16** (0.08)	0.16** (0.08)		0.14** (0.07)	0.14** (0.07)
Controls?	No	No	Yes	No	No	Yes
Constant	13.23*** (0.42)	6.23*** (0.51)	7.45*** (1.37)	6.16*** (0.73)	-0.20 (0.49)	0.83 (1.18)
Obs.	920	920	912	920	920	912

*Note: Tobit regression estimates. The variable "Angry" is a dummy variable, which takes on the value of "1" for the angry followers and "0" for the happy followers. The variable "FOB" is the first order belief for followers. The variable "SOB" is the second order belief for followers. Robust standard errors clustered at the group level are given in parentheses. Demographics include a subject's gender, age, trust, risk and understanding of instructions. Significant differences are shown using \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .*

Two key observations stand out from Table 5. First, we find that angry followers contribute significantly less than happy followers when leaders' contributions are not controlled for (Models (1) to (3)). Second, and crucially, we find that when we control for leaders' contributions, the treatment effect vanishes. This implies that it is the leaders' behavior (which is affected by the mood induction) that drives followers' behavior. The coefficient of leaders' behavior is also positive and statistically significant, implying that the higher the leaders contribute the more the followers contribute too. These results remain robust when we control for first and second order beliefs (Model (5)) as well as additional controls (Model (6)).

**RESULT 3.** *Followers contribute significantly less in the “Angry” treatment than in the “Happy” treatment. This effect is due to leaders’ contribution behavior rather than the mood induction.*

## **5. Discussion and Conclusions**

This paper presents an experimental investigation of the impact of induced anger and happiness on leading-by-example. Our framework is a sequential voluntary contributions mechanism game, which has played a key role in the social preference literature. This set-up encompasses a broad range of real-world contexts in the workplace and its study is therefore of fundamental importance as it enables us to deepen our understanding of the behavioral determinants that can promote a better working environment. Our main findings show that leading-by-example is sensitive to the emotional aspects of the decision-making environment: in particular, induced anger leads to lower cooperation both for leaders and followers. Importantly, our mood effects on followers disappear when we control for leaders’ contributions, implying that followers’ behavior is driven by the leaders’ behavior rather than the mood induction.

Leading-by-example is a key leadership style which is adopted by modern organizations and thus, our findings have key policy implications for managerial decision-making. Our findings highlight that managers need to put special emphasis on their own emotional well-being. A negative shock on their well-being can have detrimental effects not only on their own but also on the employees’ willingness to cooperate. Working in an environment that worsens employees’ well-being appears to damage organizational performance. This complements previous experimental studies showing that boosting employees’ well-being increases their productivity (e.g., Oswald et al., 2015).

A novel part of our results is that leaders’ behavior significantly affects followers’ behavior in that the effects on the followers’ behavior are driven by their leaders. As a result, it is important to stress that the emotional well-being of the leaders and managers should receive special attention. Essentially, the leaders’ well-being shapes the teams’ emotional environment and subsequently influences their performance. Our results indicate that leaders do matter a great deal when it comes to workplace well-being and

welfare. It is thus necessary for managers to take heed of their current emotional state when it comes to tasks requiring cooperation.

Our findings also broaden existing literature on how incentives may affect organizational behavior. Previous research has demonstrated that the use of financial incentives can improve performance; however, crucially, such incentives can be ineffective or even backfire (e.g., Deci, 1971; Gneezy and Rustichini, 2000; Gneezy et al., 2011). It is therefore important to consider the role of non-monetary incentives. Our study shows that inducing negative emotions (in particular, anger) may be considered as a potential (depending on how well-being is actually induced in the workplace) non-financial means that can shift behavior which can ultimately have adverse effects on employers-employees' cooperative attitudes.

Our study gives rise to a number of different future research avenues. The role of emotions needs to receive more attention in economic analysis as their effects remain to be a challenge to rational decision-making theories. In particular, more empirical evidence is necessary to better understand the channels through which behavior is causally affected by emotional states. Avoiding a workplace that negatively affects employers' and employees' well-being is a direct recommendation from our results; however, examining the extent to which other negative emotions – such as sadness or disappointment – that are also experienced in the workplace requires an accumulation of evidence from future research. Finally, we focus on the effects of induced happiness and anger in a one-shot sequential VCM game. Yet, the persistence of such effects is of great relevance, especially in the light of prior evidence showing that in repeated interactions from simultaneous VCM games, happiness leads to lower cooperation (see Proto et al., 2019). The extent to which these results carry over in our context is an essential endeavour that future research can undertake.

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## Appendix A. Experimental instructions (intended only for online publication)

### *Instructions for leaders:*

#### Welcome to the study!

This is an experiment in economic decision making, funded by University of Birmingham, UK.

The entire study should take no longer than **10 minutes**. Please make sure that you have that time at your disposal.

The study is designed to understand how people make economic decisions. You must be at least 18 years old to participate in this study.

Your responses will be kept anonymous and confidential.

You will be paid a guaranteed £1.00 for your participation upon completing the study. Depending on your decisions in the study, you will also earn an additional bonus amount. You will be given further instructions how you can earn extra money.

Your participation is completely voluntary and you can withdraw at any time during the session. However, if you withdraw, you will not receive any payments from the study.

I have read the above information. By clicking below to proceed, I agree to participate in this research.

Do you agree to participate in this study?

☐ I agree to take part. Take me to the study.

☐ I do not agree to take part in this study. Take me back to Prolific.

Next

#### Please confirm your Prolific ID

Prolific ID

Next

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## General Instructions

This is the main part of this study. In this part, you will play an economic decision-making game.

But before we get to the actual game, we will explain how the game works. This is to make sure you understand how the game works.

Once the economic game starts, you will be matched with eleven other participants who have signed up to take part in the study just like you. You will never learn the identity of the other participants. They will not learn your identity either.

The bonus payment you receive today will depend on the decisions you and the other eleven participants make in the experiment. In the instructions, unless otherwise stated, we will not speak in terms of Pounds, but in terms of Tokens. At the end of the experiment the total amount of Tokens you have earned as a bonus payment will be converted to Pounds at the following rate: **100 Tokens = £1.00**.

The following pages explain the experiment in detail. Please read them carefully.

[Next](#)

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## Description of the game

All participants in the experiment will be randomly divided into groups of twelve. So, besides you, there will be eleven more members in your group. You have to decide how many Tokens you contribute to a project of your group and how many Tokens you keep for yourself.

Every participant receives an "endowment" of 20 Tokens. You then have to decide how many of these 20 Tokens you contribute to the project or how many you keep for yourself. Each participant can contribute up to 20 Tokens. The eleven other members of your group have to make the same decision.

Every Token that you do not contribute to the project automatically belongs to you.

For every token contributed to the group project, the project's value will be multiplied by 6. If for instance 1 Token is contributed to the project, the Token's value increases to 6 Tokens.

### Making your contribution decision

One member of the group will randomly be chosen to be the 'First Mover'. This person makes their decision before the others in the group, who are referred to as 'Second Movers'. If you are chosen to be the First Mover you will be asked how many Tokens you want to contribute to the group project. You must choose a number between 0 and 20.

If you are a Second Mover, after the First Mover has made the contribution decision, you will be asked how many Tokens you want to contribute to the group project. You will be notified how many Tokens the First Mover has contributed.

### Making your contribution decision

One member of the group will randomly be chosen to be the 'First Mover'. This person makes their decision before the others in the group, who are referred to as 'Second Movers'. If you are chosen to be the First Mover you will be asked how many Tokens you want to contribute to the group project. You must choose a number between 0 and 20.

If you are a Second Mover, after the First Mover has made the contribution decision, you will be asked how many Tokens you want to contribute to the group project. You will be notified how many Tokens the First Mover has contributed.

To determine Total contributions to the project we will sum the amount contributed by the First Mover and the amount contributed by each of the Second Movers.

### Payoff from the Group Project

Once all group members have made their decision the total contribution to the group project is determined. Tokens in the group project will be divided equally among all twelve members of the group.

Thus, for every 1 token contributed to the group project every member of the group receives 0.5 tokens. Your income from the project rises by 0.5 Tokens if you contribute one Token more to the project. At the same time, the income of the other eleven members of the group also rises by 0.5 Tokens. It also holds that your income rises by 0.5 Tokens if another group member contributes one Token more to the project.

Next

## Income calculation in the experiment

Your income therefore consists of:

- (1) The tokens which you have kept for yourself ("Income from tokens kept").
- (2) The "Income from the project". This income is calculated as follows: Your income from the project = 0.5 times the total contributions to the project made by all twelve group members.

**Your Income = Income from tokens kept + Income from the project =  $(20 - \text{your contribution}) + 0.5 \times (\text{sum of tokens contributed to the project by all members of your group})$**

Back

Next

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Please indicate the intensity with which you feel, at the moment, each of the emotions below.

	Not at all								Very much
Warmth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anger	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Envy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sadness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Happiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shame	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Irritation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contempt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Guilt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Joy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jealousy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surprise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Next](#)

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Now, we would like you to watch a short video clip. After the end of the video clip, you will be asked to fill out a short questionnaire and then be asked to make the decisions for the experiment.

When you are ready, click the Next button to proceed to the video clip.

[Next](#)

[For happy leaders]:

Video



[For angry leaders]:

---

Video



Next



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Please indicate the intensity with which you feel, at the moment, each of the emotions below.

	Not at all								Very much
Warmth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anger	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Envy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sadness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Happiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shame	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Irritation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contempt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Guilt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Joy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jealousy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surprise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Next](#)

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## Decision in the experiment

You have been randomly chosen to be the **FIRST MOVER** in your group.

You have an endowment of 20 Tokens.

How many Tokens do you want to contribute to the group project?

[Next](#)

## Estimates of Second Movers' contribution

**You have been randomly chosen to be the FIRST MOVER in your group.**

We ask how many Tokens you think the Second Movers in the group will contribute in total. Note that there are eleven Second Movers and so your estimate must be a number between 0 and 220. If you estimate the correct amount you will be paid 10 extra Tokens. If you do not estimate the correct amount you will receive no Tokens.

How much do you think the eleven Second Movers will contribute in total to the group project?

### Estimates of other's estimate

We ask you to think about the estimates of others. All eleven Second Movers in your group have been asked how many tokens they think the First Mover, i.e. you, will contribute. How many Tokens do you think the Second Movers expected you to contribute? If you estimate the correct amount you will be paid 10 extra Tokens. If you do not estimate the correct amount you will receive no Tokens.

How many Tokens do you think the Second Movers expect you to contribute? Add together your estimates for all eleven Second Movers.

Next

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## Final questionnaire

1. What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other

2. What is your age?

3. Is English your first language?

- ☐ Yes
- ☐ No

4. How important was for you to maximise your own income during the experiment?

- ☐ Very important
- ☐ Important
- ☐ Indifferent
- ☐ Not important
- ☐ Not important at all

5. Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?

- ☐ Most people can be trusted  
☐ You need to be very careful in dealing with people

6. Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please use the following scale, where the value 0 means: **risk averse** and the value 10 means: **fully prepared to take risks**.



7. How did you find the instructions?

- ☐ Very difficult  
☐ Difficult  
☐ Neutral  
☐ Easy  
☐ Very easy

8. Do you think that the SECOND MOVERS watched the same video like you did?

- ☐ Yes, they watched the same video clip.

7. How did you find the instructions?

- ☐ Very difficult  
☐ Difficult  
☐ Neutral  
☐ Easy  
☐ Very easy

8. Do you think that the SECOND MOVERS watched the same video like you did?

- ☐ Yes, they watched the same video clip.  
☐ No, they watched a different video clip.  
☐ I do not know.

9. How many economics experiments have you participated in before this one?

10. Do you have any other comments or feedback regarding this experiment?

Next

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## Thank you

This is the end of the study.

Thank you for your participation.

You will earn £1.00 immediately for your participation. The additional bonus payment will be paid to you in a few weeks' time once we have finished calculating the payment to all the participants.

Please click the 'Next' button below to finish the study and return to Prolific.

[Next](#)

## *Instructions for followers:*

### Welcome to the study!

This is an experiment in economic decision making, funded by University of Birmingham, UK.

The entire study should take no longer than **10 minutes**. Please make sure that you have that time at your disposal.

The study is designed to understand how people make economic decisions. You must be at least 18 years old to participate in this study.

Your responses will be kept anonymous and confidential.

You will be paid a guaranteed £1.00 for your participation upon completing the study. Depending on your decisions in the study, you will also earn an additional bonus amount. You will be given further instructions how you can earn extra money.

Your participation is completely voluntary and you can withdraw at any time during the session. However, if you withdraw, you will not receive any payments from the study.

I have read the above information. By clicking below to proceed, I agree to participate in this research.

Do you agree to participate in this study?

- ☐ I agree to take part. Take me to the study.
- ☐ I do not agree to take part in this study. Take me back to Prolific.

Next

### Please confirm your Prolific ID

Prolific ID

Next

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## General Instructions

This is the main part of this study. In this part, you will play an economic decision-making game.

But before we get to the actual game, we will explain how the game works. This is to make sure you understand how the game works.

Once the economic game starts, you will be matched with eleven other participants who have signed up to take part in the study just like you. You will never learn the identity of the other participants. They will not learn your identity either.

The bonus payment you receive today will depend on the decisions you and the other eleven participants make in the experiment. In the instructions, unless otherwise stated, we will not speak in terms of Pounds, but in terms of Tokens. At the end of the experiment the total amount of Tokens you have earned as a bonus payment will be converted to Pounds at the following rate: **100 Tokens = £1.00**.

The following pages explain the experiment in detail. Please read them carefully.

[Next](#)

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## Description of the game

All participants in the experiment will be randomly divided into groups of twelve. So, besides you, there will be eleven more members in your group. You have to decide how many Tokens you contribute to a project of your group and how many Tokens you keep for yourself.

Every participant receives an "endowment" of 20 Tokens. You then have to decide how many of these 20 Tokens you contribute to the project or how many you keep for yourself. Each participant can contribute up to 20 Tokens. The eleven other members of your group have to make the same decision.

Every Token that you do not contribute to the project automatically belongs to you.

For every token contributed to the group project, the project's value will be multiplied by 6. If for instance 1 Token is contributed to the project, the Token's value increases to 6 Tokens.

### Making your contribution decision

One member of the group will randomly be chosen to be the 'First Mover'. This person makes their decision before the others in the group, who are referred to as 'Second Movers'. If you are chosen to be the First Mover you will be asked how many Tokens you want to contribute to the group project. You must choose a number between 0 and 20.

If you are a Second Mover, after the First Mover has made the contribution decision, you will be asked how many Tokens you want to contribute to the group project. You will be notified how many Tokens the First Mover has contributed.

### Making your contribution decision

One member of the group will randomly be chosen to be the 'First Mover'. This person makes their decision before the others in the group, who are referred to as 'Second Movers'. If you are chosen to be the First Mover you will be asked how many Tokens you want to contribute to the group project. You must choose a number between 0 and 20.

If you are a Second Mover, after the First Mover has made the contribution decision, you will be asked how many Tokens you want to contribute to the group project. You will be notified how many Tokens the First Mover has contributed.

To determine Total contributions to the project we will sum the amount contributed by the First Mover and the amount contributed by each of the Second Movers.

### Payoff from the Group Project

Once all group members have made their decision the total contribution to the group project is determined. Tokens in the group project will be divided equally among all twelve members of the group.

Thus, for every 1 token contributed to the group project every member of the group receives 0.5 tokens. Your income from the project rises by 0.5 Tokens if you contribute one Token more to the project. At the same time, the income of the other eleven members of the group also rises by 0.5 Tokens. It also holds that your income rises by 0.5 Tokens if another group member contributes one Token more to the project.

Next

## Income calculation in the experiment

Your income therefore consists of:

- (1) The tokens which you have kept for yourself ("Income from tokens kept").
- (2) The "Income from the project". This income is calculated as follows: Your income from the project = 0.5 times the total contributions to the project made by all twelve group members.

**Your Income = Income from tokens kept + Income from the project =  $(20 - \text{your contribution}) + 0.5 \times (\text{sum of tokens contributed to the project by all members of your group})$**

Back

Next

Please indicate the intensity with which you feel, at the moment, each of the emotions below.

	Not at all								Very much
Warmth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anger	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Envy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sadness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Happiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shame	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Irritation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contempt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Guilt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Joy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jealousy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surprise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Next

Now, we would like you to watch a short video clip. After the end of the video clip, you will be asked to fill out a short questionnaire and then be asked to make the decisions for the experiment.

When you are ready, click the Next button to proceed to the video clip.

Next



[For happy followers]:

Video



[For angry followers]:

---

Video



Next

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Please indicate the intensity with which you feel, at the moment, each of the emotions below.

	Not at all								Very much
Warmth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anger	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Envy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sadness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Happiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shame	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Irritation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contempt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Guilt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Joy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jealousy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surprise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Next](#)

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## Estimates of First Mover's contribution

You have been randomly chosen to be the **SECOND MOVER** in your group.

We ask how many Tokens you think the First Mover in the group will contribute. If you estimate the correct amount you will be paid 10 extra Tokens. If you do not estimate the correct amount you will receive no Tokens.

How much do you think the First Mover will contribute to the group project?

### Estimates of other's estimate

We ask you to think about the estimates of others. The First Mover in your group has been asked how many tokens they think the Second Movers, i.e. you and other ten Second Movers, will contribute in total. How many Tokens do you think the First Mover expects Second Movers to contribute? If you estimate the correct amount you will be paid 10 extra Tokens. If you do not estimate the correct amount you will receive no Tokens.

How many Tokens do you think the First Mover expects Second Movers to contribute in Total?

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## Decision in the experiment

You have been randomly chosen to be the **SECOND MOVER** in your group.

You have an endowment of 20 Tokens.

The **FIRST MOVER** has contributed 1 Tokens to the group project.

How many Tokens do you want to contribute to the group project?

Next

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## Final questionnaire

1. What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other

2. What is your age?

3. Is English your first language?

- ☐ Yes
- ☐ No

4. How important was for you to maximise your own income during the experiment?

- ☐ Very important
- ☐ Important
- ☐ Indifferent
- ☐ Not important
- ☐ Not important at all

5. Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?

- ☐ Most people can be trusted
- ☐ You need to be very careful in dealing with people

6. Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please use the following scale, where the value 0 means: **risk averse** and the value 10 means: **fully prepared to take risks**.

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Risk averse

Fully prepared to take risks

7. How did you find the instructions?

- ☐ Very difficult
- ☐ Difficult
- ☐ Neutral
- ☐ Easy
- ☐ Very easy

8. Do you think that the FIRST MOVER watched the same video like you did?

- ☐ Yes, they watched the same video clip.
- ☐ No, they watched a different video clip.

7. How did you find the instructions?

- ☐ Very difficult
- ☐ Difficult
- ☐ Neutral
- ☐ Easy
- ☐ Very easy

8. Do you think that the FIRST MOVER watched the same video like you did?

- ☐ Yes, they watched the same video clip.
- ☐ No, they watched a different video clip.
- ☐ I do not know.

9. How many economics experiments have you participated in before this one?

10. Do you have any other comments or feedback regarding this experiment?

Next

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## Thank you

This is the end of the study.

Thank you for your participation.

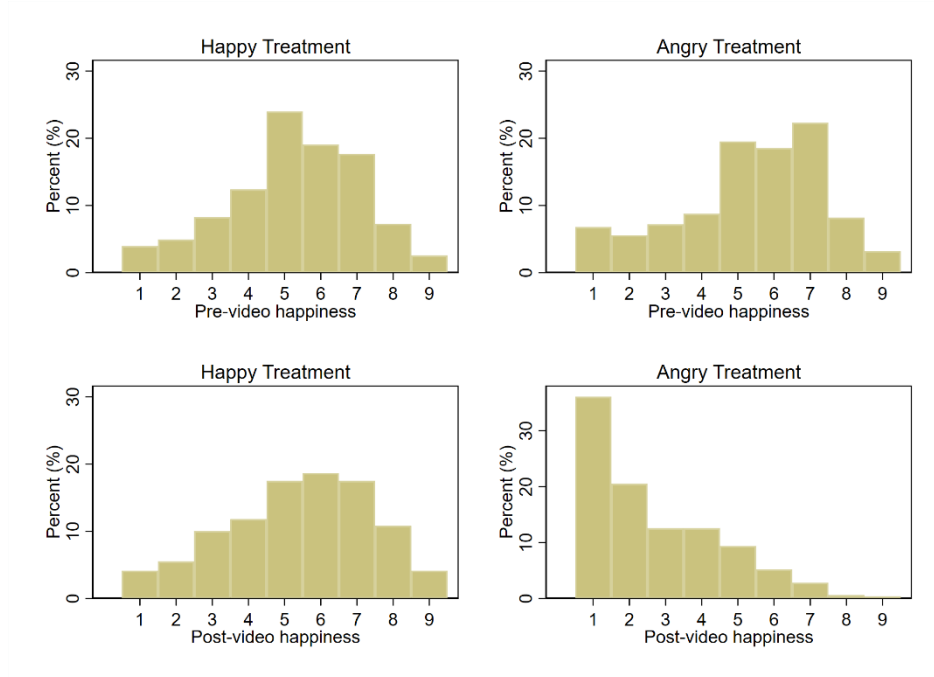
You will earn £1.00 immediately for your participation. The additional bonus payment will be paid to you in a few weeks' time once we have finished calculating the payment to all the participants.

Please click the 'Next' button below to finish the study and return to Prolific.

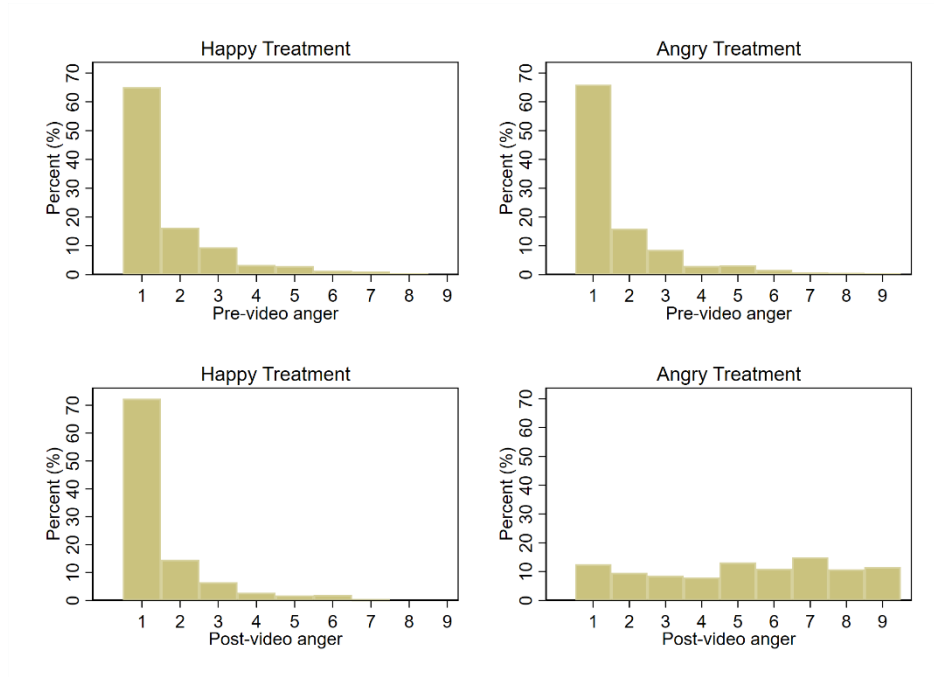
[Next](#)

## Appendix B. Additional analysis

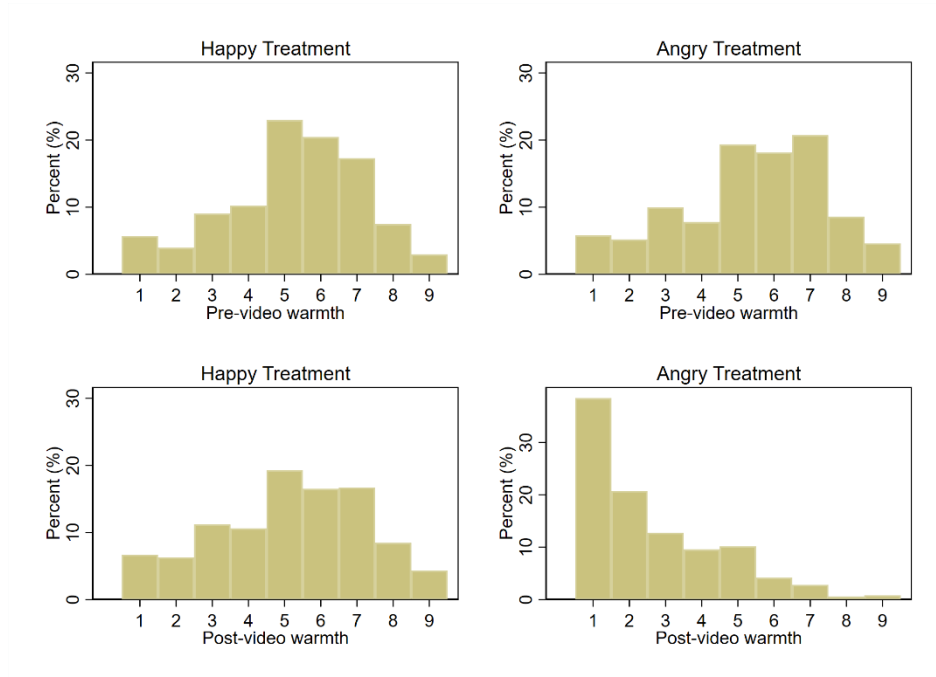
**Figure B.1** Distribution of pre- and post-video happiness across treatments



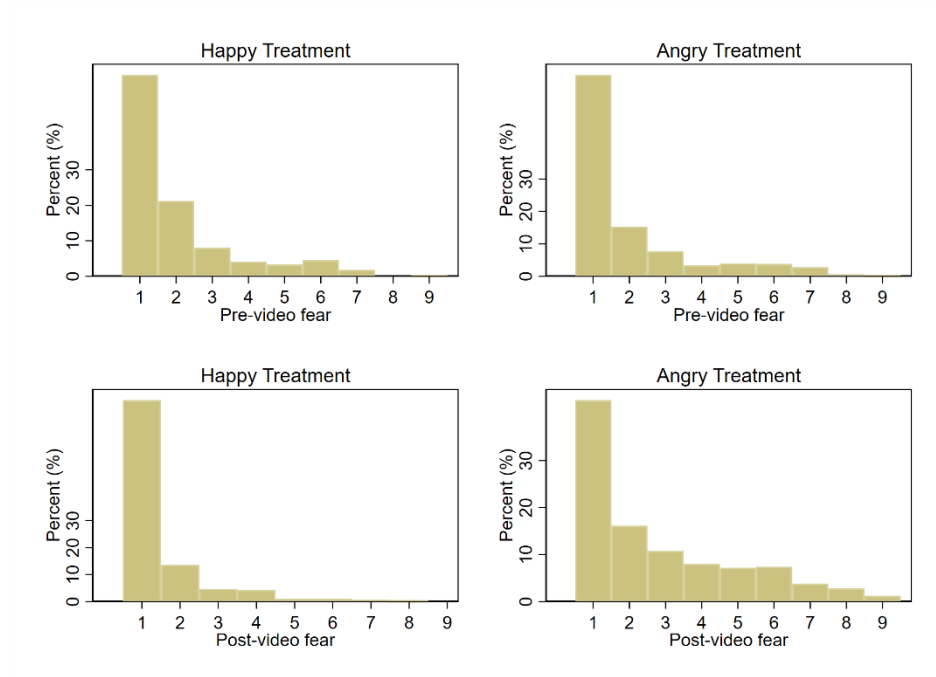
**Figure B.2** Distribution of pre- and post-video anger across treatments



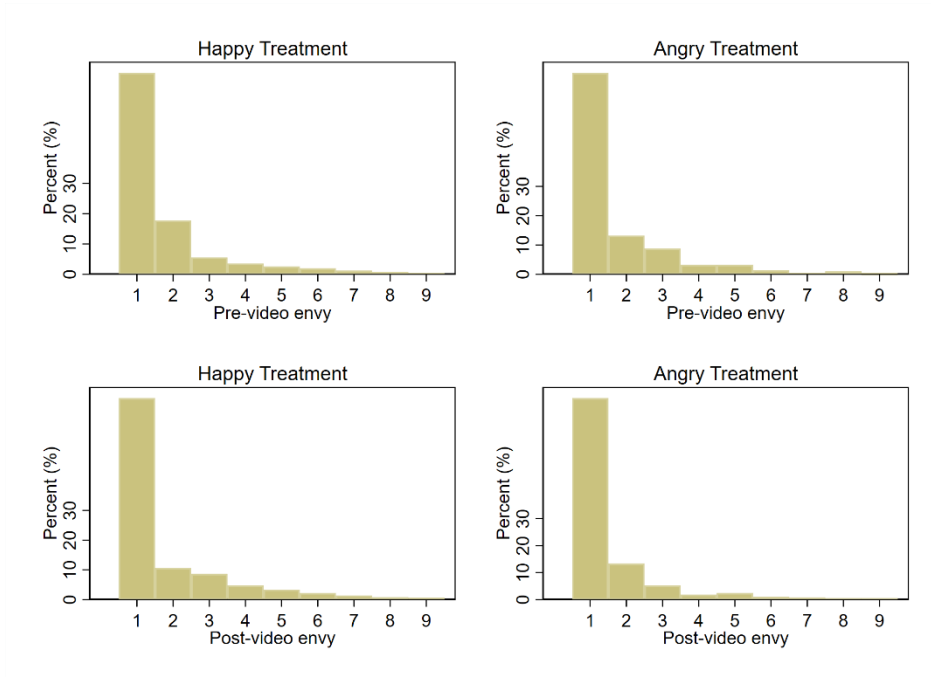
**Figure B.3** Distribution of pre- and post-video warmth across treatments



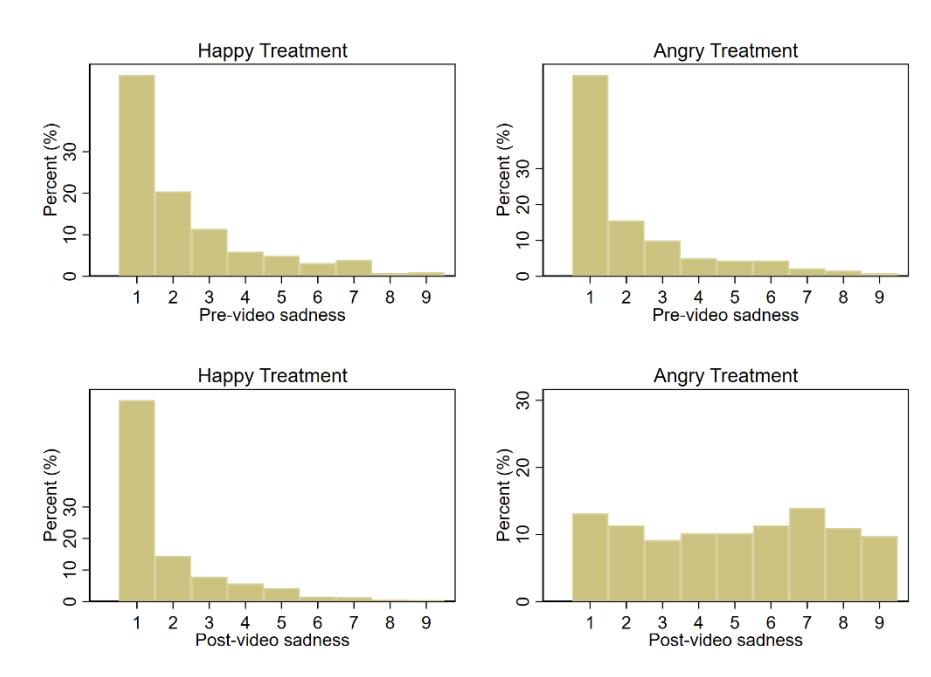
**Figure B.4** Distribution of pre- and post-video fear across treatments



**Figure B.5** Distribution of pre- and post-video envy across treatments

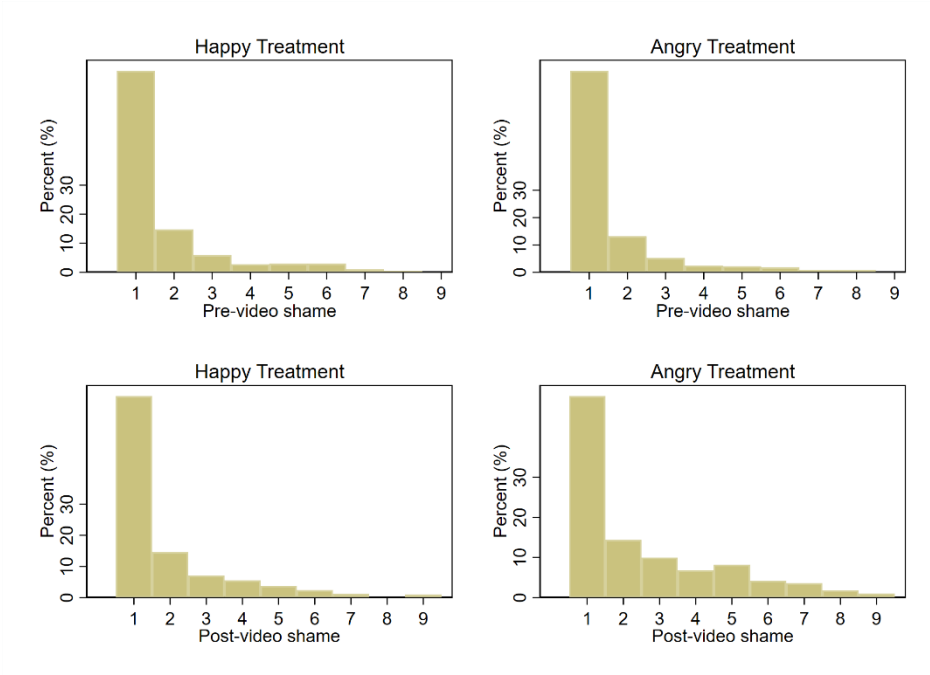


**Figure B.6** Distribution of pre- and post-video sadness across treatments

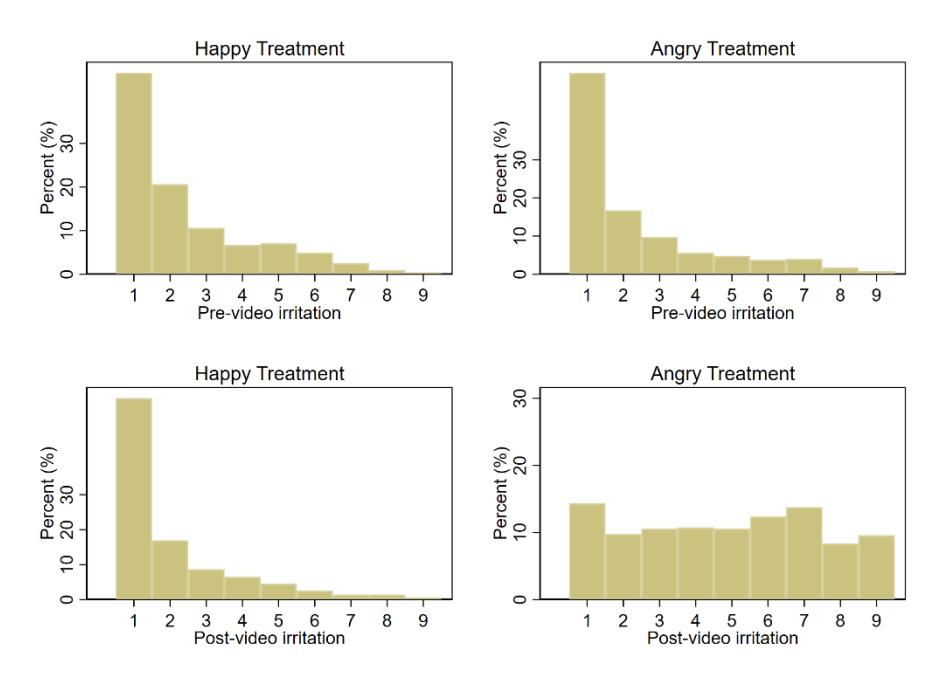




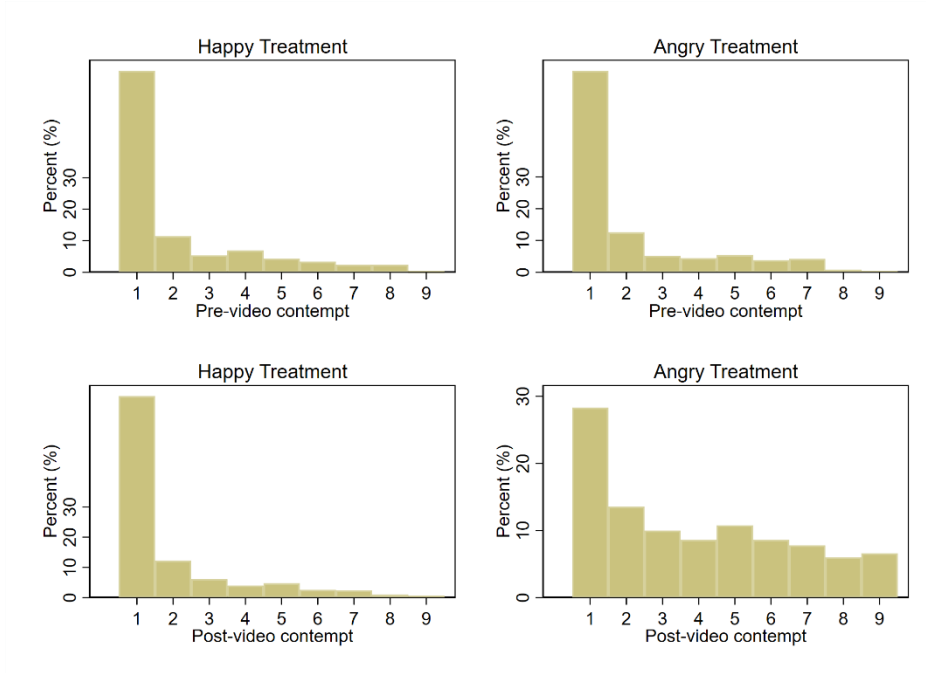
**Figure B.7** Distribution of pre- and post-video shame across treatments



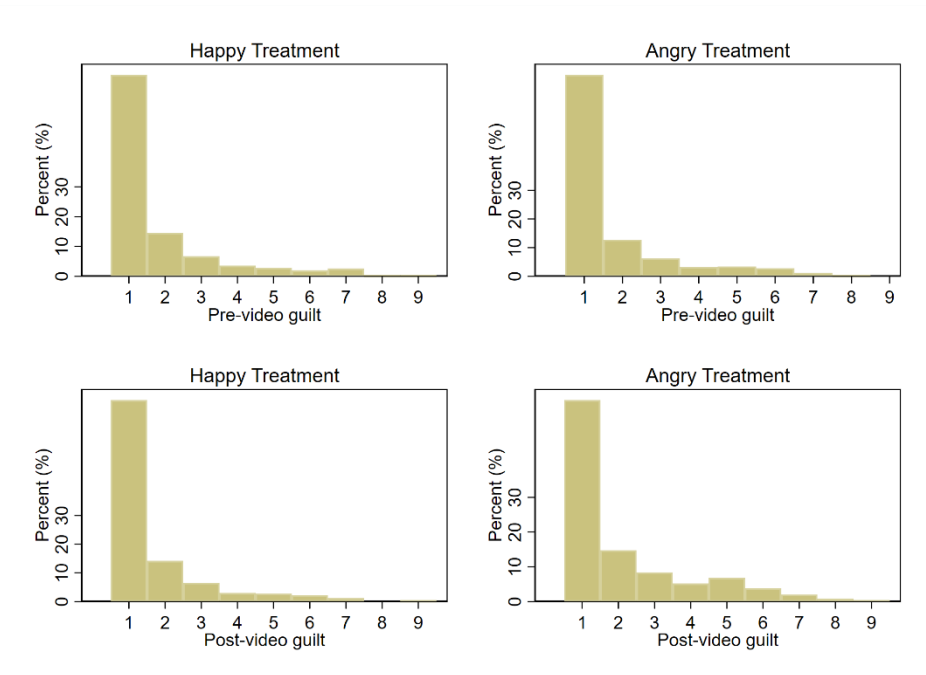
**Figure B.8** Distribution of pre- and post-video irritation across treatments



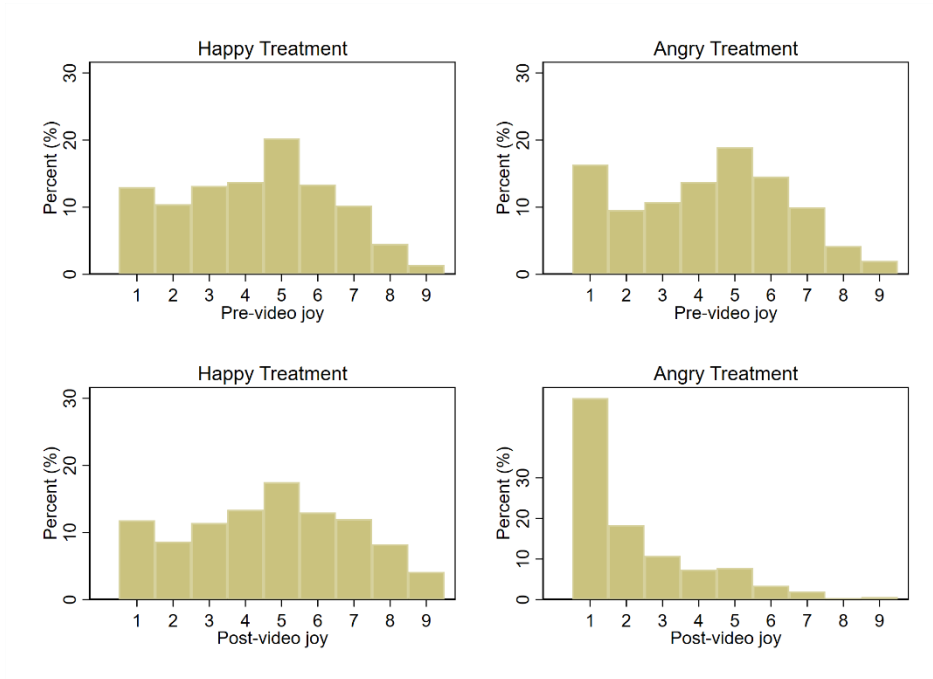
**Figure B.9** Distribution of pre- and post-video contempt across treatments



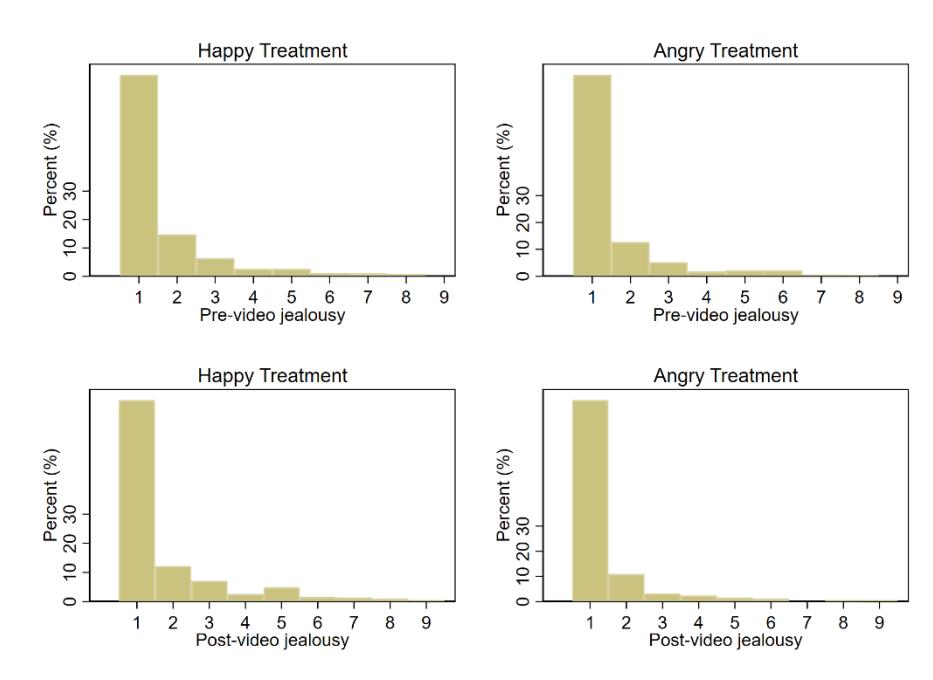
**Figure B.10** Distribution of pre- and post-video guilt across treatments



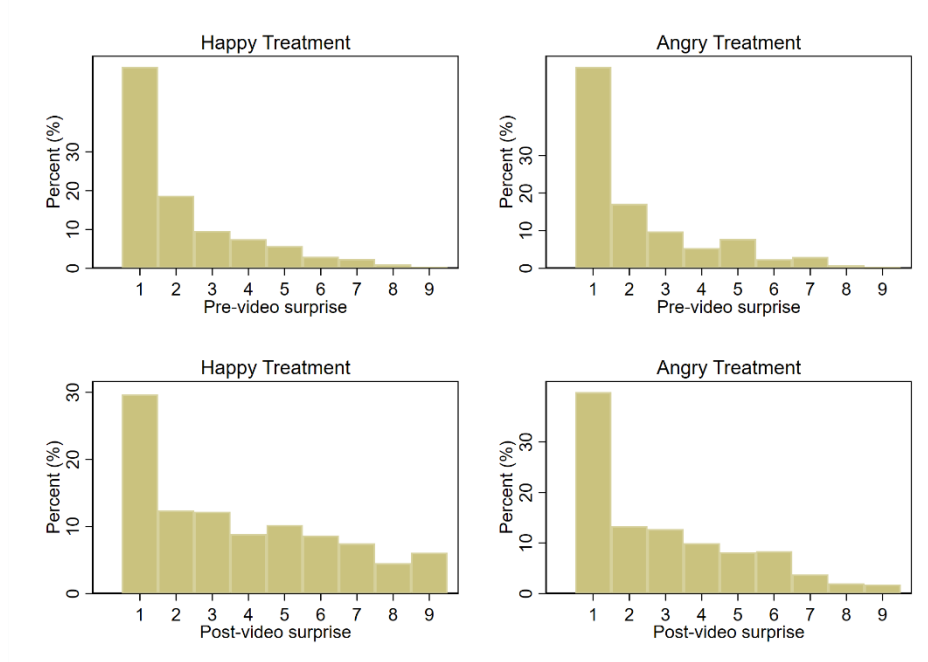
**Figure B.11** Distribution of pre- and post-video joy across treatments



**Figure B.12** Distribution of pre- and post-video jealousy across treatments



**Figure B.13** Distribution of pre- and post-video surprise across treatments



**Table B.1** Determinants of contribution behavior – Regression results

Dependent variable: Contribution to public good by subject i				
	(1)	(2)	(3)	(4)
Negative index	-0.18** (0.09)	-0.19** (0.09)		
Positive index			0.26** (0.12)	0.28** (0.12)
Controls?	No	Yes	No	Yes
Constant	12.94*** (0.33)	11.11*** (1.36)	13.01*** (0.32)	11.27*** (1.38)
Obs.	1011	1001	1011	1001

*Note:* Tobit regression estimates. The variable “Negative index” takes on the value of the difference between negative emotions (anger, sadness and irritation) measured after elicitation and before elicitation. The variable “Positive index” takes on the value of the difference between positive emotions (warmth, happiness and joy) measured after elicitation and before elicitation. Robust standard errors clustered at the group level are given in parentheses. Demographics include a subject’s gender, age, trust, risk and understanding of instructions. Significant differences are shown using \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

**Table B.2 Determinants of leaders' contribution behavior — Regression results**

Dependent variable: Contribution to public good by subject i				
	(1)	(2)	(3)	(4)
Negative index	-0.11 (0.37)	-0.13 (0.35)		
Positive index			0.44 (0.34)	0.51 (0.37)
Controls?	No	Yes	No	Yes
Constant	13.55*** (1.01)	9.83** (4.87)	13.93*** (1.04)	9.29* (4.97)
Obs.	91	89	91	89

*Note: Tobit regression estimates. The variable "Negative index" takes on the value of the difference between negative emotions (anger, sadness and fear) measured after elicitation and before elicitation. The variable "Positive index" takes on the value of the difference between positive emotions (warmth, happiness and joy) measured after elicitation and before elicitation. Robust standard errors clustered at the group level are given in parentheses. Demographics include a subject's gender, age, trust, risk and understanding of instructions. Significant differences are shown using \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .*

**Table B.3 Determinants of followers' contribution behavior — Regression results**

Dependent variable: Contribution to public good by subject i								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Negative index	-0.20** (0.09)	-0.21** (0.09)			-0.00 (0.08)	-0.01 (0.07)		
Positive index			0.24* (0.13)	0.26** (0.13)			0.04 (0.11)	0.05 (0.11)
Leader's contribution					0.50*** (0.05)	0.51*** (0.05)	0.50*** (0.05)	0.51*** (0.05)
Controls?	No	Yes	No	Yes	No	Yes	No	Yes
Constant	12.89*** (0.35)	11.16*** (1.41)	12.92*** (0.34)	11.36*** (1.44)	6.39*** (0.65)	4.85*** (1.28)	6.46*** (0.65)	4.90 (1.29)
Obs.	920	912	920	912	920	912	920	912

*Note: Tobit regression estimates. The variable "Negative index" takes on the value of the difference between negative emotions (anger, sadness and irritation) measured after elicitation and before elicitation. The variable "Positive index" takes on the value of the difference between positive emotions (warmth, happiness and joy) measured after elicitation and before elicitation. Robust standard errors clustered at the group level are given in parentheses. Demographics include a subject's gender, age, trust, risk and understanding of instructions. Significant differences are shown using \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .*