Emotions predict decline of cooperation in a real life social dilemma

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Social dilemmas in energy domain

- Social dilemmas are pervasive in behaviour and applicable to real world scenarios where social interactions occur over restricted resources;
- By nature of the dilemma- if some individuals use more than others – they end up free riding on other people's wealth;
- Environment decisions often depend on the choices of others: e.g., reducing energy consumption at home makes a difference to the environment only if everybody does so;

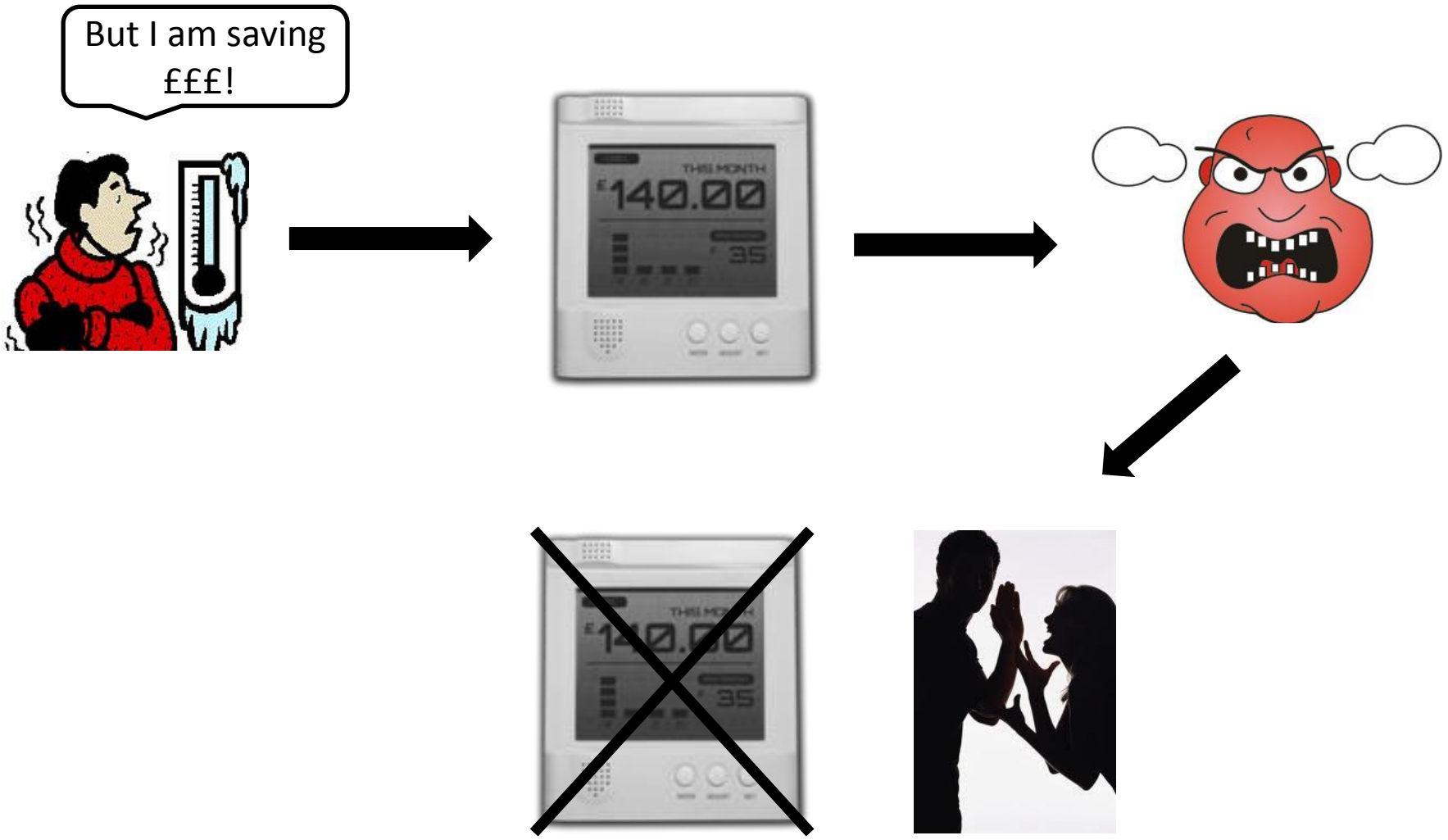
- Can environment and energy behaviours, as well as choices that lead to them, be modelled by experimental social dilemmas?

Practical problem: household energy use

- Smart meters – can provide with accurate information about energy use;
- by 2020 across UK at cost of £11.7 billion to taxpayer;
- 25% of the £7 billion benefits are expected to be achieved through domestic households decreasing their energy use;
- What will happen when people have this extra accurate information, e.g., in a shared household (of related or unrelated individuals)?
- What are the consequences of implementing the displays?

- <u>Can communal energy displays create a social dilemma in the household?</u>

Implications: communal display of energy



Cooperation in social dilemmas

- Social dilemma is a situation when self/communal interests are in a conflict;
- Implies communal use of a resource, which can be exhausted if individuals do not coordinate their actions;
- By nature of the dilemma- if some individuals use more than others – they end up free riding on other people's wealth;
- At least some proportion of individuals free ride in the social dilemma context, but there are others who cooperate;
- Free riding usually increases towards the end of the block of games;
- Cooperation collapses when people face unfair behaviour of others;

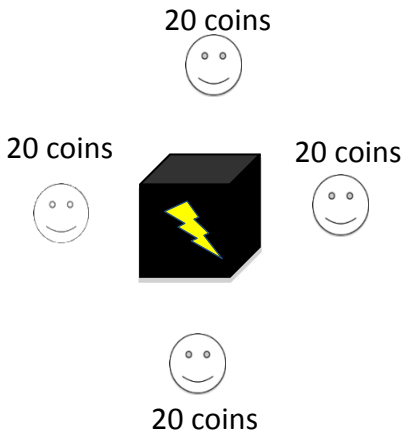
- <u>Which psychological mechanisms underpin the change in behaviour when facing unfairness?</u>

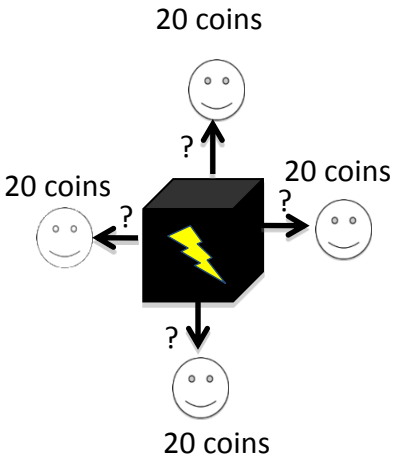
Emotions and cooperation

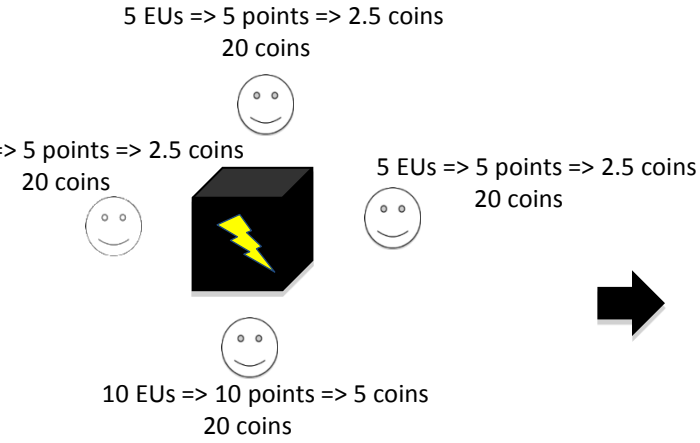
- Self-report and brain-imaging studies demonstrated that information about fair or unfair behaviour of others evokes anger and other emotions (e.g., shame, guilt, gratitude);
- Emotions are known to bias people's choices and lead to change of their behaviour;
- Anger, which is associated with "altruistic punishment" (taking personal cost to punish a free rider), has been proposed as one of the mechanisms to sustain cooperation;
- However, anger might also lead to retaliation (e.g., increase in free riding).

- <u>In what way specific emotions affect cooperation in social dilemmas?</u>

Communal Energy Dilemma



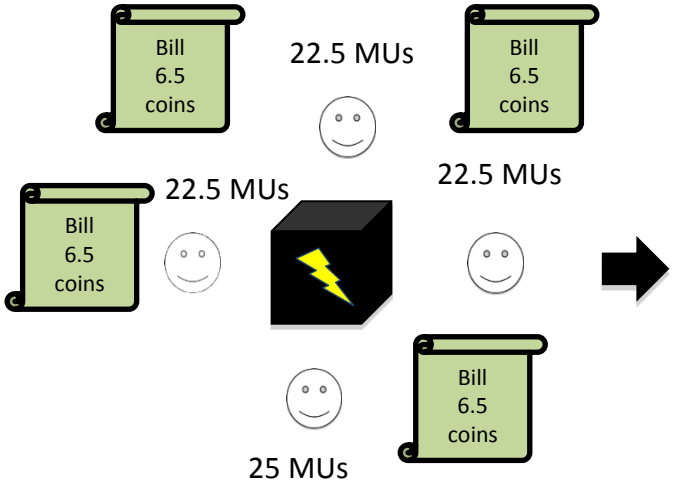


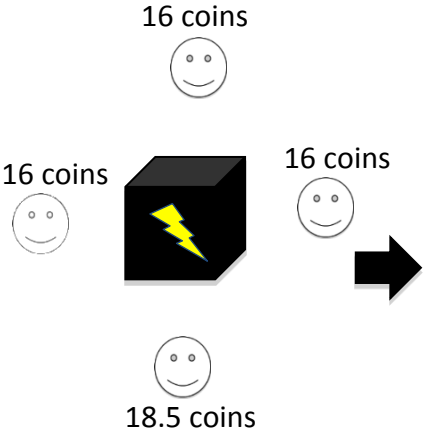


0 stage: Each participant has an equal money endowment and is matched with a group of 3 other players.

1 stage: Participant decide (individually) how much electricity do they want to use on this round (ranging between 5 to 20 Electricity Units, EUs).

2 stage: All EUs are converted into the Money Units (Mus) based on the conversion rate (1EU = 1point , 2points = 1 coin) and every participants has now initial endowment plus the benefit from using electricity.





Happy
Angry 1 2 3 4 5 6 7
Guilty
Fearful
Disgusted
Irritated
Shameful
Grateful
Joyful
Surprised

3 stage: Each participant gets the bill for the overall electricity use of the group, where each of them have to pay equally. 1 EU costs 1 coin.

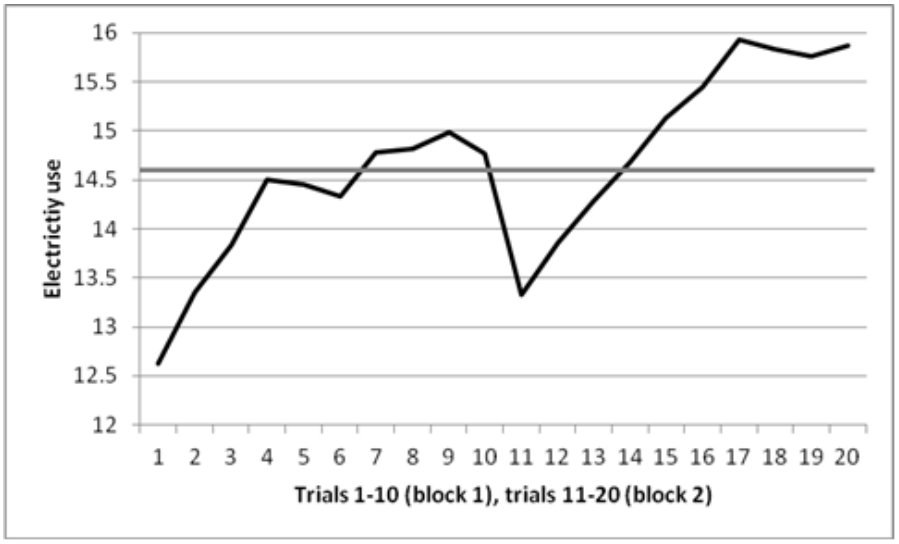
4 stage: Participants find out (individually) about their earnings during the game.

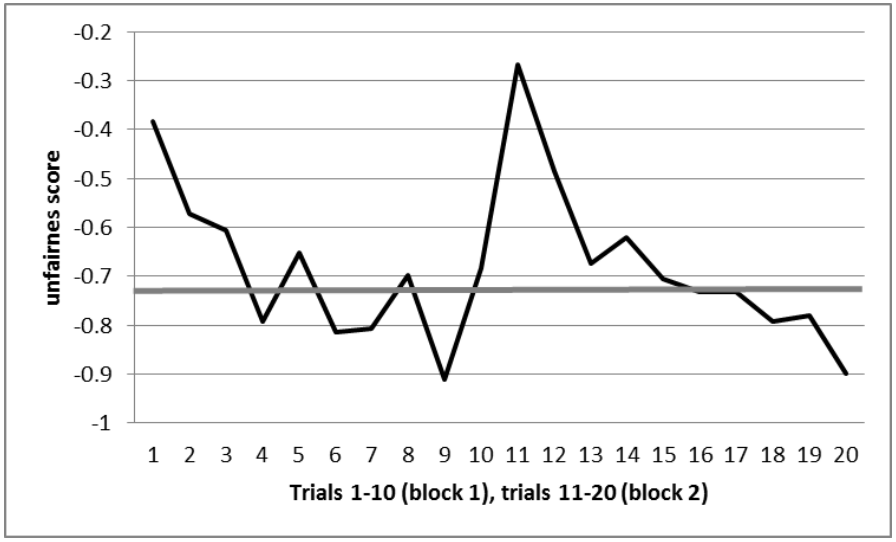
Stage 5: Participants need to rate (individually) how they feel on the scale from 1 to 7.

Sample & Procedure

- 118 participants took part in 20 repeated-interactions communal energy dilemma games.
- The games were organized in two blocks.
- For each block participants played with the same group partners.
- They were reimbursed by £7 on average for an hour long study.
- Experiment was administrated via Z-tree.

Uncooperative use of energy by others predicted increase in energy use



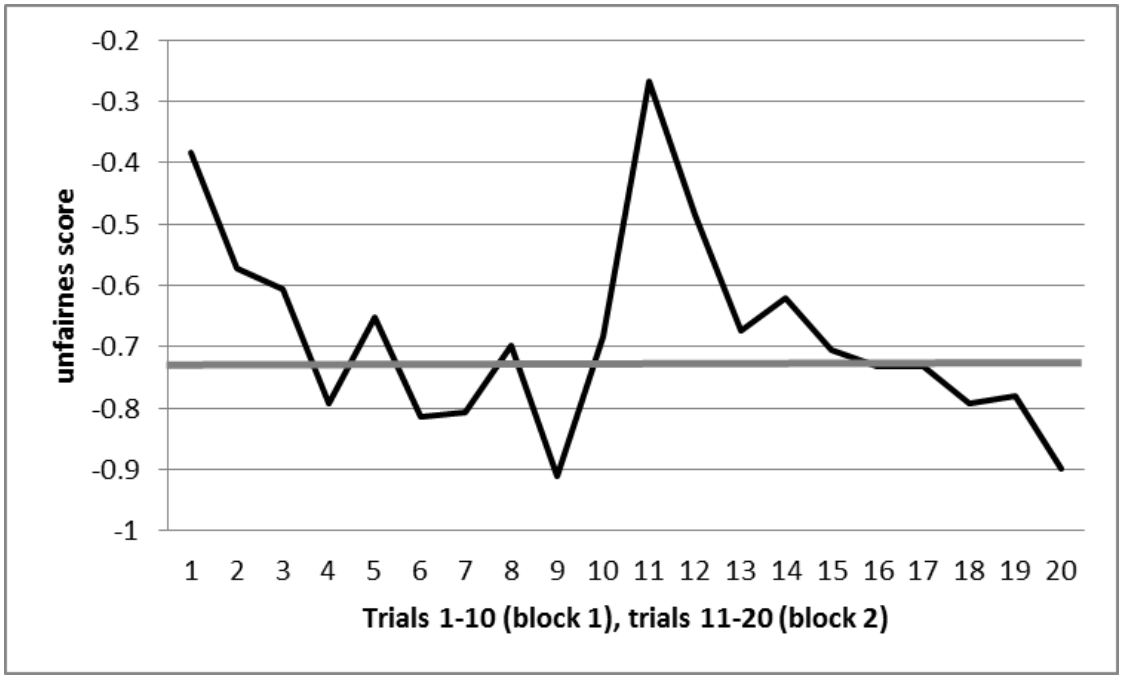


$Electricity_n$ <~ .73(.03)*$electricity_{n-1}$ + .02(.03)$trial_n$ + .23(.16)block + .36(.03)*unfairness, β(SEM)

* p <.0001

More electricity <~ others used more (unfair)

Uncooperative use by others predicted emotions



Emotion$_n$ <~ electricity$_{n-1}$ + trial$_n$ + block + unfairness

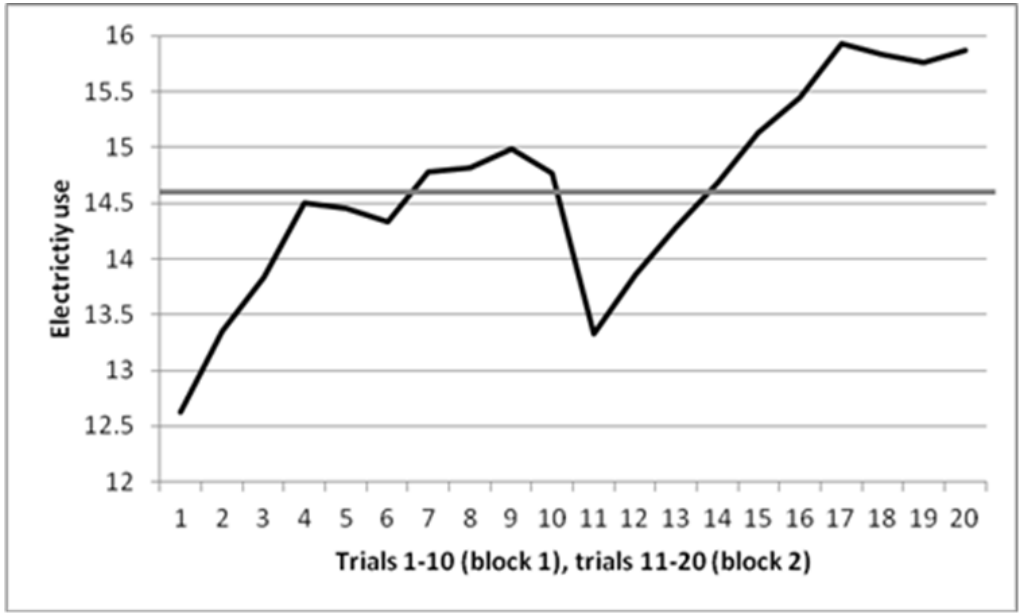
	Anger	Disgust	Irritation	Fear	Shame	Guilt	Gratitude	Happiness	Joy
Unfair	0.22*** (0.01)	0.11*** (0.01)	0.23*** (0.01)	0.04*** (0.01)	-0.02** (0.01)	-0.06*** (0.01)	-0.14*** (0.01)	-0.18*** (0.01)	-0.15*** (0.01)

* - $p < .05$, ** - $p < .01$, ***-$p < .001$

Anger/disgust/irritation/fear <~ others use more energy (unfair)

Shame/guilt/gratitude/happiness/joy <~ others use less energy

Energy use was predicted by emotions



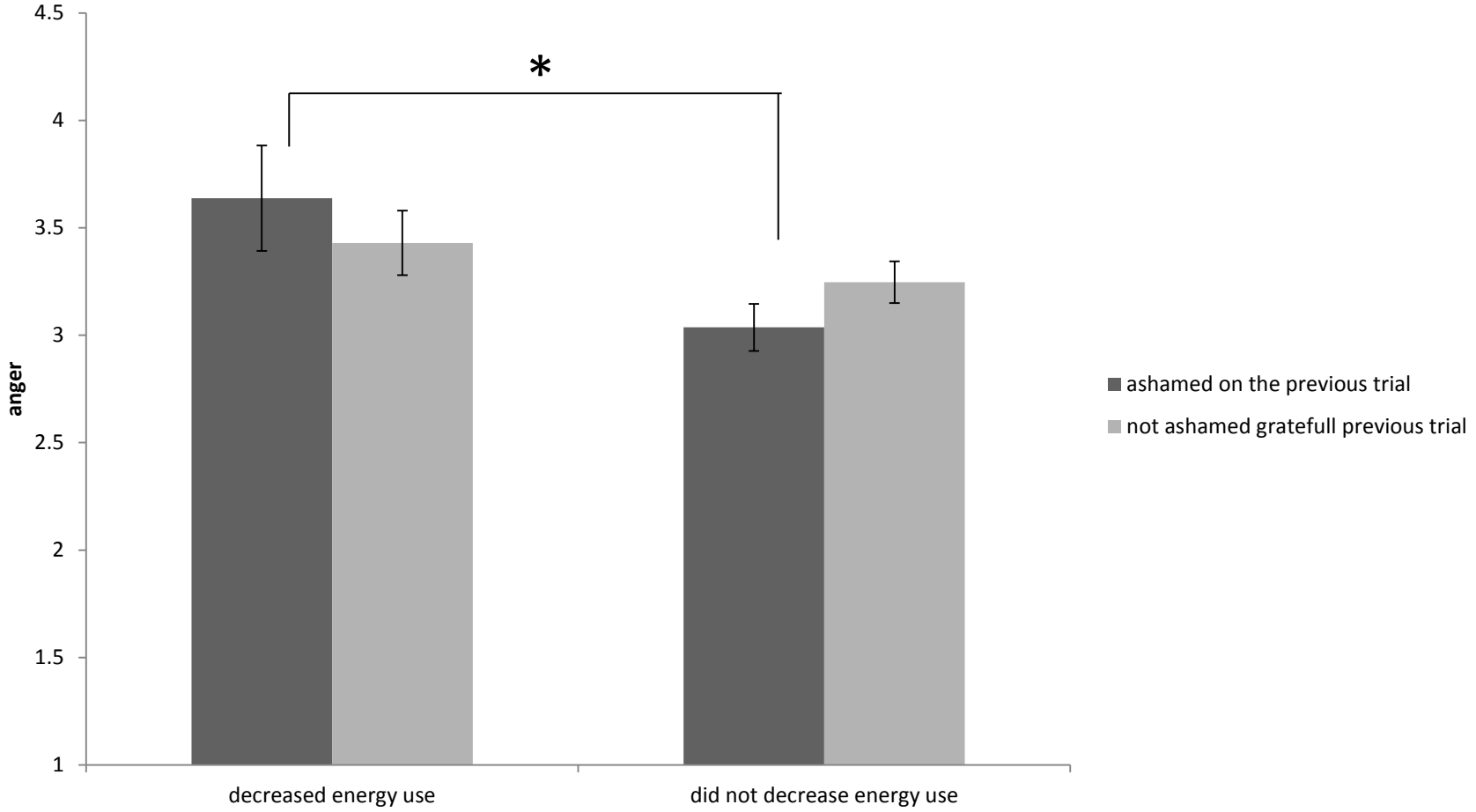
Electricity$_n$<~ electricity$_{n-1}$ + trial$_n$ + block + unfairness + emotion, β(SEM)

More electricity use<~.23*(.06)anger/.29***(.07)disgust/.26***(.06)irritation**

Less electricity use <~ -.17(.09)*shame/-.26(.07)*gratitude**

*****p < .001,p < .01; *p<.05**

Turning the other cheek after feeling ashamed….but others are unfair!



Summary: energy use and emotions

- An increase in energy use predicted by unfair use of energy by others;
- When others used more energy (unfair), participant reported anger, disgust, irritation and fear;
- When others use less energy, participants reported shame, guilt, gratitude, happiness and joy;
- An increase in absolute and relative energy use predicted by anger mainly;
- A decrease in absolute energy use predicted by shame;
- Shame, followed by unresponded attempt to repair, leads to anger.

Conclusions

- Change in cooperation levels when facing unfairness was predicted by emotions;
- Anger predicted decline of cooperation when no altruistic punishment mechanisms were in place;
- Shame predicted attempts to increase cooperation, however, when unsuccessful shame led to anger;
- Environmental choices can be studied through social dilemma paradigms.