Sustainable decision-making

…and non-monetary incentives

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for the full report please see:

http://www.uu.nl/SiteCollectionDocuments/REBO/REBO_USE/REBO_USE_OZZ/DP%202013/13-16.pdf

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Conferentie Mechanism Design in Actie

Het Ontwerpen van Maatschappelijke Instituties

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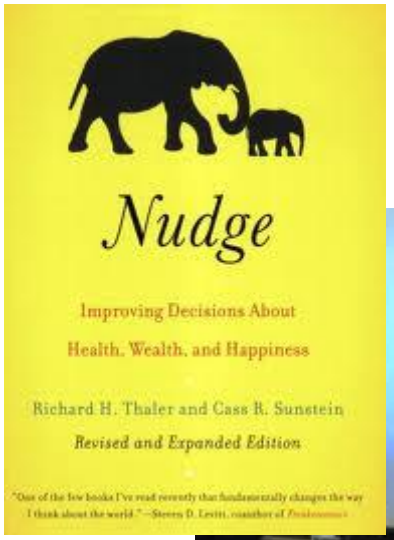
Nudging energy consumers towards energy efficiency behaviour …



Private initiatives: e.g. www.nudge.nl (duurzam consumentenplatform)

Aim of the project "sustainable decision making"

1. Improve upon existing studies
   - taking stock of the current state-of-the-art regarding the ***effects of non-price interventions on energy efficiency*.**
   - suggest and test ways in which nudges that have shown to be promising can be further *improved upon in their effectiveness (combination of nudges)*.
2. Analyze the behavior of *individuals that are in a "managerial" position*.

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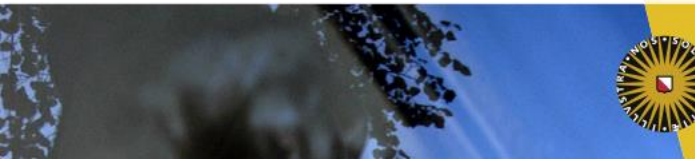
What do we know about the effect of nudges?

Humans and Econs

What do we know about the effect of nudges on energy efficiency?



What do we know about the effect of nudges on energy efficiency?

1. Commitment devices

Humans procrastinate, commitment devices are interventions that allow individuals to "lock" themselves *today* into the action that they want to take *tomorrow*.

Pallak and Cummings (1976) used commitment to promote gas and electricity conservation among households.

- Those who had signed a *public commitment* (i.e. publication in a leaflet) showed a *lower rate of increase* in both gas and electricity consumption than those in either the *private commitment* or the *control* group.
- This effect was maintained over a period of 6 months following discontinuation of the intervention.

What do we know about the effect of nudges on energy efficiency?

1. Commitment devices

Rosenkranz et al. (2013) used private commitment to induce ***future*** (environmental) charity giving in the laboratory.

- In the experiment we found that participants were indeed willing to postpone present consumption in favour of future payments to an environmentally oriented charity.
- No significant differences between the group with a commitment device and the control group when decisions concern **future payments**.
- But when decisions concern **present payments** the control group donated on average €0.84 (6,96 %), while the commitment group donated significantly more with on average €2.37 (19,79%).

What do we know about the effect of nudges on energy efficiency?

2. Default options

People rarely switch away from the option that requires no action. Sticking to the "default option" represents a frequently observed and strong inertia behaviour.

McCalley (2006), default settings of household appliances may be subjected to environmentally-friendly regulation.

- Setting the default temperature on washing machines to "cold" could save up to 24% in terms of total amount of energy used, compared to regular machine settings.

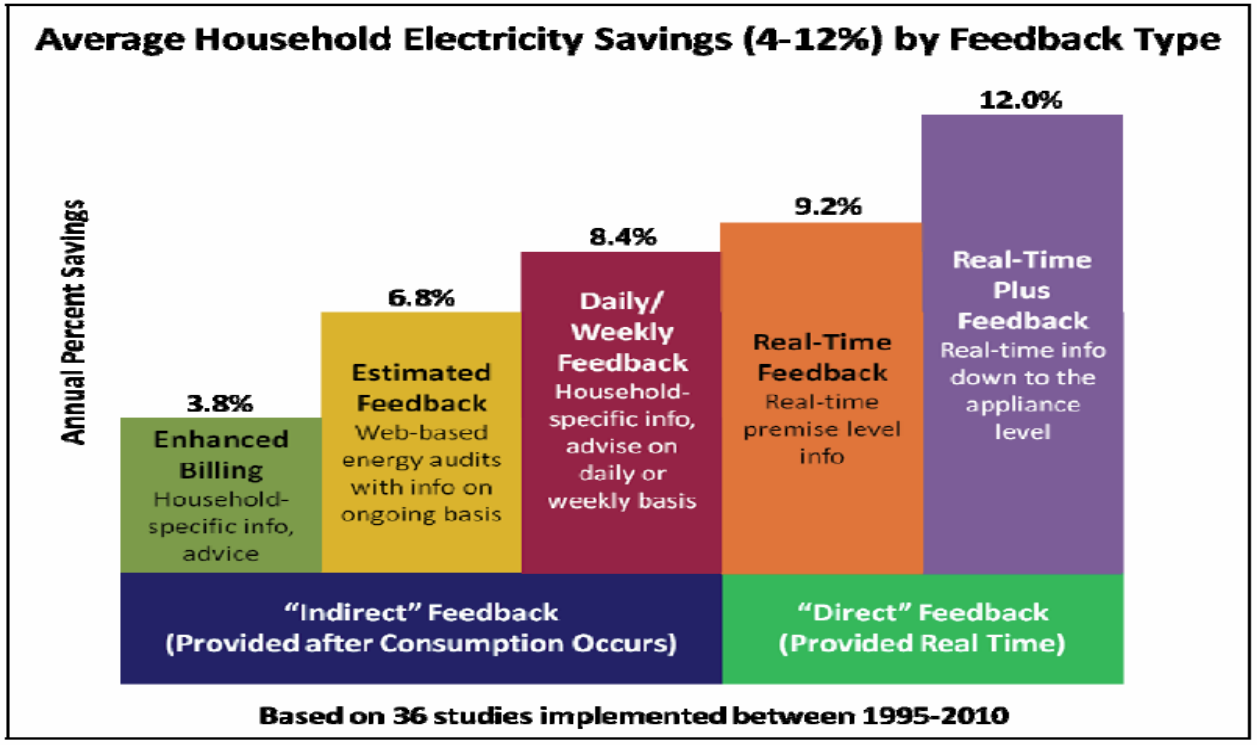
What do we know about the effect of nudges on energy efficiency?

3. Information and feedback

Behavioral changes are positively associated with the provision of a *limited* amount of relevant and targeted information, and *specific* and *timely* feedback.

Ehrhardt-Martinez et al. (2010)

- Experiments have pointed to a potential for electricity use reductions in the magnitude of between 4% and 20% (Stern 1992, Fischer 2008).



What do we know about the effect of nudges on energy efficiency?

4. Social norms

Observing what others do can strongly affect individuals' actions by influencing what they perceive to constitute appropriate behaviour in a given situation.

- Dolan and Metcalfe (2013), Nolan et al. (2008) and Schultz et al. (2007) found that the use of social norms resulted in household energy savings of 5.7–10% and that the use of both *descriptive and injunctive norms* was important in shaping household energy behaviours.

What do we know about the effect of nudges on energy efficiency?

5. Framing

People judge the expected outcomes of their actions *relative* to some reference point.

- Prior studies found that placing a decision either in a positive frame (gain) or in a negative frame (loss) changed decisions by up to 26% (e.g., Tversky & Kahneman, 1981; Haude & Todd, 2011).
- The use of mental accounts implies that people tend to have a separate budget for various types of goods and services (e.g., food, clothing, energy) (Houde & Todd, 2011).

What do we know about the effect of nudges on energy efficiency?

6. Status and self-image

Individuals have strong preferences for occupying a high position in the social ranking among their peers, and this preference is likely to be an important motivation of human social and economic behaviour (Barankay, 2012).

- Houde and Todd (2011) suggest that tools that appeal to image motivation could be to display boards or lists of people who have made substantial energy conservation contributions.

- This striving for (self-)image and status works not only at the level of the individual but also at the group level (e.g., competitions between neighbourhoods with respect to energy reductions, Houde & Todd, 2011).

What do we know about the effect of nudges on energy efficiency?

7. Comparison social norms and image concerns

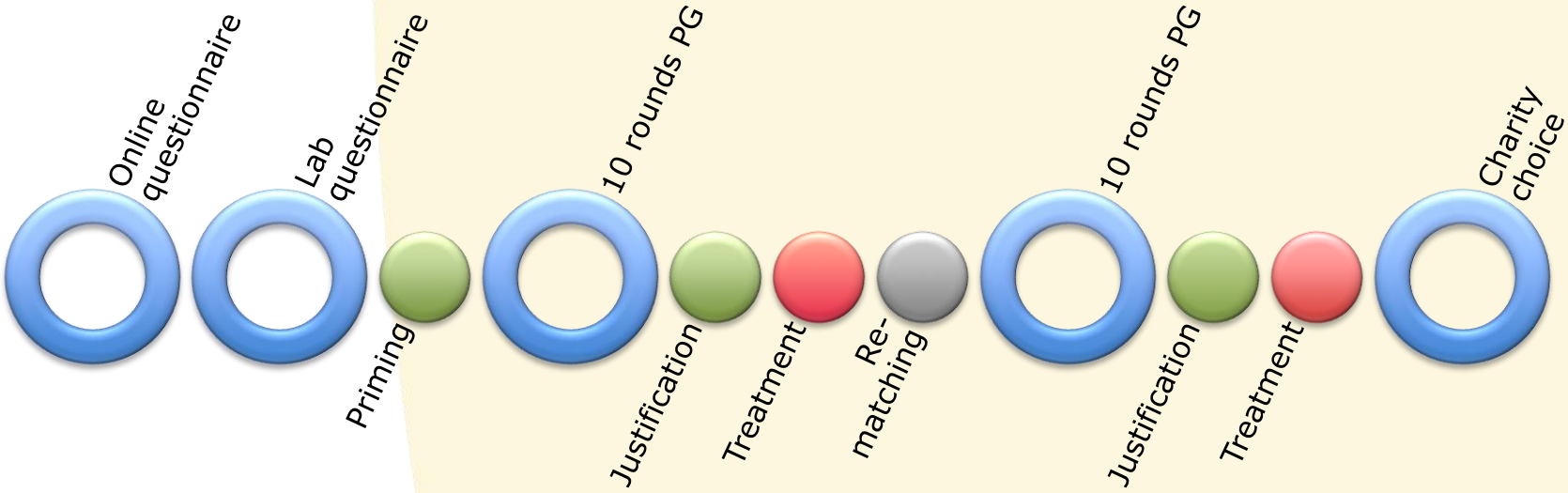
Rosenkranz et al. (2013) compare the usefulness of norms and public ranking as instruments to stimulate pro-social behaviour in the laboratory (Public goods game).

Baseline treatment

Public Good Game (Voluntary Contribution Mechanism), with a linear production function, framed in an environmental context.

- 24-28 participants per session, divided into 6-7 groups of 4 people playing with each other.
- Participants need to indicate (on the screen) how many tokens they want to allocate to a private account and how many to a "social account".
- The money to the "social account" is multiplied by an efficiency factor x= 1.6 by the experimenter and distributed evenly among all members of the group.
- Dependent variable: individual contribution to social account.

Public Goods Game Treatments



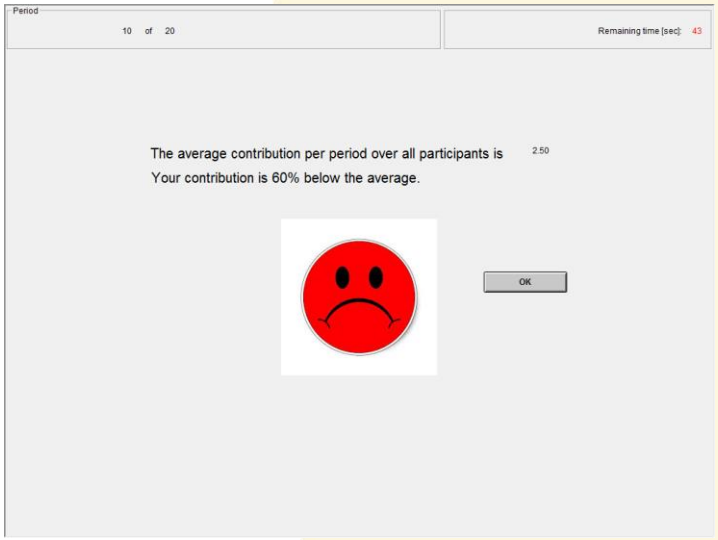
Observations

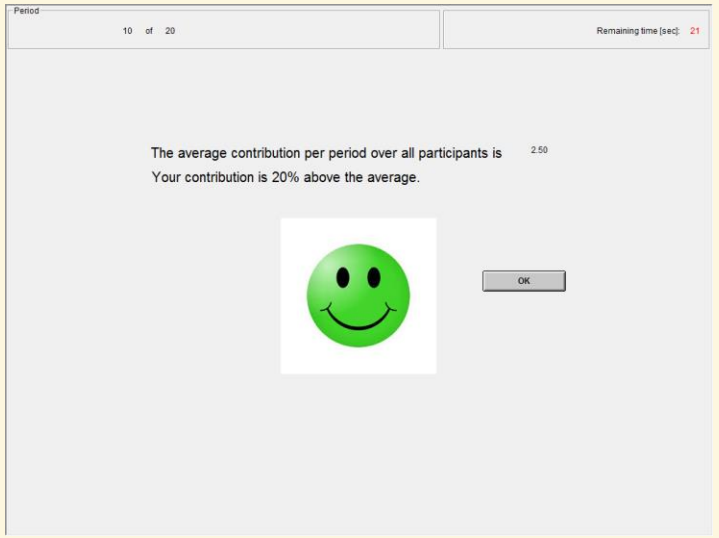
Manager priming

Treatment: Norm *or* Ranking

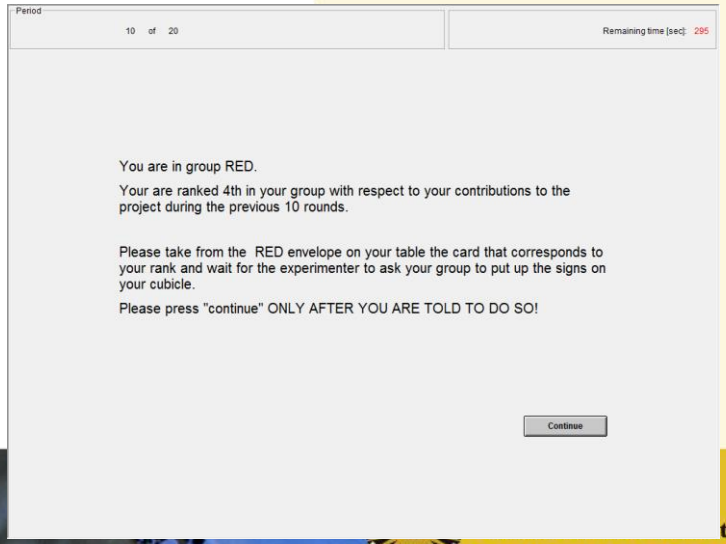
Treatments: Norm and Ranking

Norm informative and injunctive

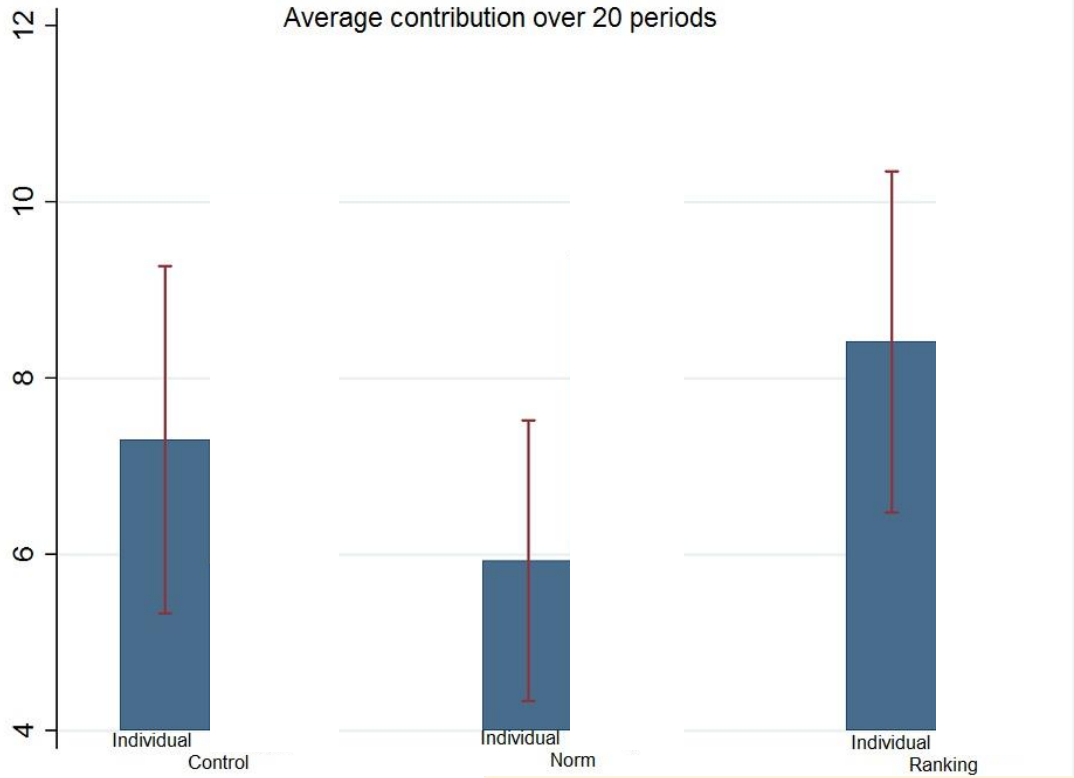




Ranking



Results: Individuals



N=66

Comparison Individuals	Z-score	Effect size
Norm-Control	-1.056	0
Ranking-Control	0.784	0
Ranking-Norm	1.974**	0.27 (medium)

Session/ Contribution	Round 1[1]	Round 2[1]
Individual Control	7.30	7.30
Individual Norm	5.60	6.27
Individual Ranking	8.90	7.93

*,**,*** indicate p<0.1, <0.05, <0.01 for Wilcoxon rank-sum test
1. Wilcoxon rank-sum and median tests comparing the difference in contributions between rounds for each session.

No effects were found regarding charity giving as dependent variable.

What do we know about the effect of nudges on energy efficiency?

- In contrast to previous (field) studies, we find that individuals' response to a (informative and injunctive) norm is insignificant.

- We find a medium size positive effect of addressing individuals' image concerns (ranking).

Interim Conclusions: Individuals

- Individuals' response to a (informative and injunctive) norm is insignificant, in contrast to previous (field) studies.

  => Effect weakened by trade-off due to strategic framework?
- The anticipation of the confrontation with a norm has similar effects as the experience of the norm itself.

- Potential medium size positive effect of addressing image concerns (ranking).
- The anticipation of a ranking has similar effects as the experience of the ranking itself.

  => Effect supported by strategic framework?

  => Increase competitiveness by ranking groups of individuals?

Policy implications: do's and don'ts

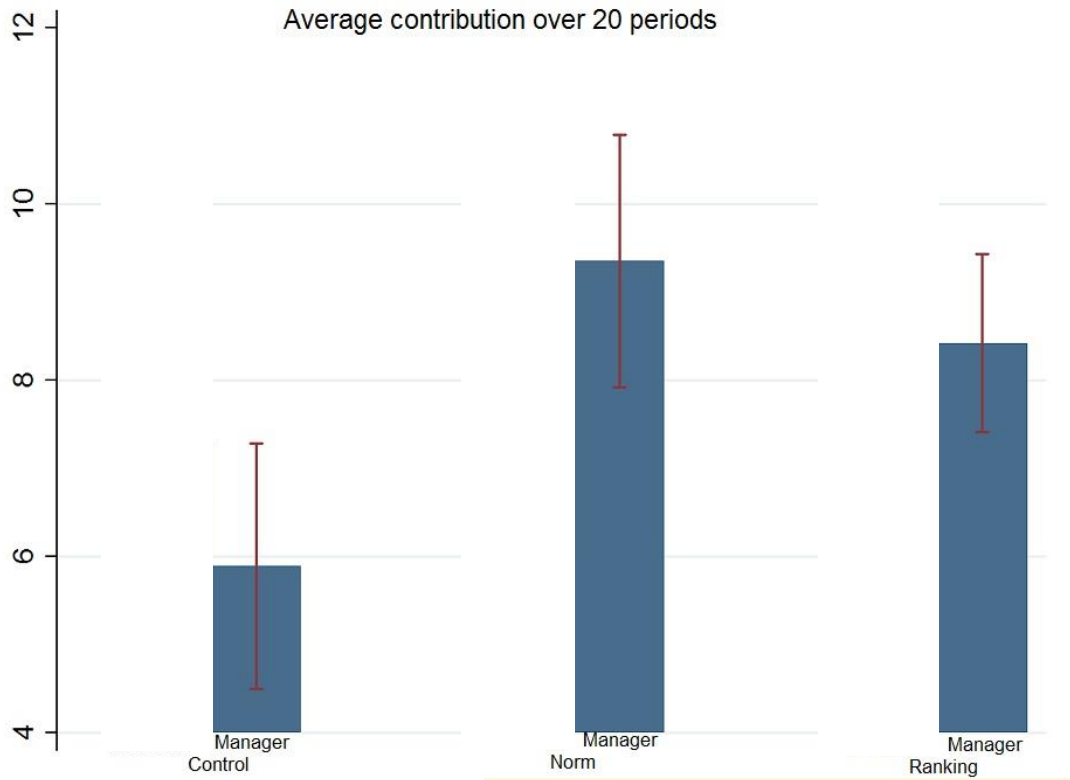
- Use informative and conjunctive norms in explicitly non-strategic settings.
- Don’t use norms when there are clear trade-off between private benefit and social benefits.
- Use a social norm that can hardly be affected by the individual but is still psychologically close enough (e.g., broader neighbourhood).
- Use rankings in explicitly strategic settings, i.e. when individuals can influence the norm itself.

What do we know about the effect of nudges on energy efficiency?

8. Comparison of individuals and 'managers'

Rosenkranz et al. (2013) study the usefulness of both nudges for ***individuals in managerial positions***.

Results: Managers



N=68

Comparison Managers	Z-score	Effect size
Norm-Control	3.114***	0.42 (large)
Ranking-Control	2.478**	0.34 (medium)
Ranking-Norm	-1.258	0

Session/Contribution	Round 1[1]	Round 2[1]
Manager Control	6.90+	4.88+
Manager Norm	8.95	9.76
Manager Ranking	9.25**,+	7.64**,+

*,**,*** indicate p<0.1, <0.05, <0.01 for Wilcoxon rank-sum test and +,++,+++ indicate p<0.1, <0.05, <0.01 for median test.
1. Wilcoxon rank-sum and median tests comparing the difference in contributions between rounds for each session.

No effects were found regarding charity giving as dependent variable.

Interim Conclusions: Managers

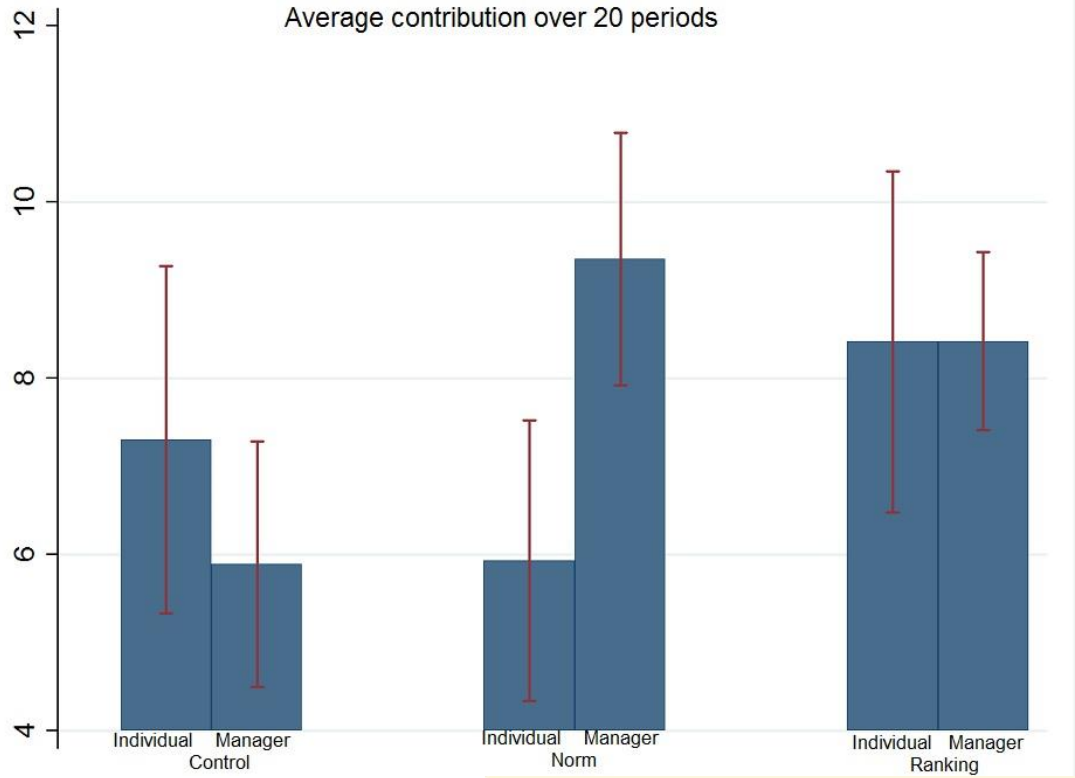
- Potential large positive effect of managers' response to a norm.
  - ➢ The effect of justification in comparison to a norm?
- The anticipation of the confrontation with a norm has similar effects as the experience of the norm itself.

- Potential medium size positive effect of addressing managers' image concerns (ranking).
- The anticipation of a ranking has stronger effects than the experience of the ranking itself.

Policy implications: do's and don'ts

- Use informative and conjunctive norms for firms.
- Let firms regularily *justify* (explicitly and in a form that directly links the person with the content (e.g., in writing or speaking; rather than signing only); with public visibility) their relevant investment decisions.
- Refer to the anticipation of the ranking, e.g. by applying it randomly.

Results: Managers versus Individuals



Comparison Ind. vs Man.	Z-score	Effect size
Ind. Control-Man. Control	0.99	0
Ind. Norm-Man. Norm	-3.246***	-0.43 (large)
Ind. Ranking-Man. Ranking	0.021	0

*,**,*** indicate p<0.1, <0.05, <0.01 for Wilcoxon rank-sum test.

Implementation: Households

- Give households feedback about their relative *ranking* in relation to a relevant peer group.
- Make households' *ranking* in relation to a relevant peer group publicly visible.
  - Rank neighbourhoods based on their energy consumption, e.g., "Utrecht-Oost" vs. "Utrecht-Centrum"; "Houten" vs. "Nieuwegein".
  - Identify appropriate scope, e.g. in a group based-ranking follow-up study ("close enough but not so small as to be strategic").

Implementation: Firms

- Focus on *social norm*. Relative performance with respect to the norm does not need to be publicly visible.
- Focus on *explicit justification* which is *tied to the person (manager)*.
- Justification should focus on justifying deviation from norm (industry/firm size/…: relevant peers); tricky part: data and calculation of norm; easier than ranking though and data less sensitive (only below/or above) !

Implication for specific Instruments

Instruments targeted at private households

1. ***The Energy Statement***

Information feedback
Social norms
Ranking
Framing

2. ***The Smart Meter***

Information feedback
Social norms
Framing

Instruments targeted at firms

1. ***The Long Term Agreements***

Social norms
Ranking
Justification
Commitment and goal setting

There is little reason to believe …

- that policies that are inspired by research on behavioural patterns observed in the laboratory would be successful in the real world,
- that behavioural patterns observed in isolated field studies in one country are relevant for other countries.
- There are several reason to assume that causal mechanisms may not be transposable.

Important step: Verification of effects in field studies

Only field studies (randomized controlled trials) in the Netherlands that …

(1) study behavior for a longer period, and that

(2) use nudges that are related to the discussed instruments and consciously designed,

… will allow to draw *quantitative* conclusions about the potential effect on changes in energy efficiency of such non-price interventions.

See recommendations of the Behavioural Insights Team (UK)

Thank you for your attention!

http://www.uu.nl/SiteCollectionDocuments/REBO/REBO_USE/REBO_USE_OZZ/DP%202013/13-16.pdf

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