American Economic Review: Papers & Proceedings 2011, 101:3, 318–322
http://www.aeaweb.org/articles.php?doi=10.1257/aer.101.3.318

The Persistence of Treatment Effects with Norm-Based Policy Instruments: Evidence from a Randomized Environmental Policy Experiment

By Paul J. Ferraro, Juan Jose Miranda, and Michael K. Price*

During a 1977 fireside chat, President Jimmy Carter famously appealed to American homeowners to set their thermostats at 65 degrees to help conserve supplies of natural gas and fuel oil. Norm-based strategies are commonly used to influence a range of private behaviors with public consequences, including alcohol and drug use, gambling, and resource consumption. In the last decade, these strategies increasingly emphasize the use of social comparisons to motivate behavioral changes. Efforts to use such comparisons build upon Leon Festinger's (1954) social comparison theory, which posits that individuals validate the appropriateness of an action or thought through comparison to others.

A subsequent literature in social psychology argues that strategies based on this theory provide an effective means to promote environmental conservation (see, e.g., Tim Kurz, Ngaire Donaghue, and Ian Walker 2005; P. Wesley Schultz et al. 2007; Noah J. Goldstein, Robert B. Cialdini, and Vladas Griskevicius 2008; Jessica M. Nolan et al. 2008). In this literature, the work by Schultz et al. (2007) has proven most influential and forms the basis of OPOWER's well-cited, social comparison approach for promoting residential energy conservation in US cities.[1] Studies evaluating its programs have become the cornerstone of a growing research agenda in economics exploring the effect of social comparisons on conservation efforts (Ian Ayres, Sophie Raseman, and Alice Shih 2009; Hunt Allcott 2010). Results from these studies suggest that providing households with Home Energy Reports that include social comparisons leads to significant reductions in average monthly energy use.

Despite the apparent success of norm-based messages as a means to affect demand, the existing literature has focused exclusively on short-run effects. Yet, from a policy perspective, the long-run impacts of such initiatives are of equal concern. Before one can advance such strategies as viable options to fight climate change or rebuild water stocks, it is critical to understand whether and how they influence demand in *both* the short and long run. In this regard, it is important to assess whether norm-based strategies promote long-run conservation efforts or affect little more than short-lived behavioral adjustments.

The goal of our study is to examine how different norm-based strategies influence long-run patterns of residential water use. In 2007, a water utility in metropolitan Atlanta, Georgia implemented a natural field experiment that randomized households into four treatments: a control group, a group that received technical advice, a group that received both technical advice and an appeal to prosocial preferences, and a group that received both technical advice and an appeal to prosocial preferences that included a social comparison (see Ferraro and Price 2009). For our purposes, the most important findings from Ferraro and Price (2009) are that (i) technical advice has a negligible impact on behavior

*Ferraro: Department of Economics, Andrew Young School of Policy Studies, Georgia State University, PO Box 3992, Atlanta, GA 30302-3992 (e-mail: pferraro@gsu.edu); Miranda: Department of Economics, Andrew Young School of Policy Studies, Georgia State University, PO Box 3992, Atlanta, GA 30302-3992 (e-mail: ecojjmx@langate.gsu.edu); Price: Department of Economics, 515 Stokely Management Center, University of Tennessee, Knoxville, TN 27996 (e-mail: mprice21@utk.edu). The authors thank Kathy Nguyen, Herb Richardson, and Kathleen Brown for water data, and Hunt Allcott, Merlin Hanauer, John List, Subhrendu Pattanayak, Laura Taylor, and participants at the 2009 and 2011 AEA-ASSA meetings, GA Water Wise Council, the Georgia Association of Water Professionals, University of California-Davis, North Carolina State University, University of North Carolina, Virginia Tech, and Yale University for comments that markedly improved the study.

[1] For more information on OPOWER, see http://www.opower.com.

but (ii) augmenting such messages to include normative appeals and social comparisons leads to significant reductions in average water use in the four months after treatment assignment.

With knowledge of the initial treatment assignment and subsequent patterns of water use, we examine post-treatment residential water demand over the period 2007–2009. The empirical results are striking. While appeals to prosocial preferences and social comparisons affect short-term patterns of water use, only messages augmented with social comparisons have a lasting impact on water demand. Within a year of treatment assignment, we are unable to detect meaningful differences in use across households who received an appeal to prosocial preferences and counterparts in the control group. In contrast, impacts from the social comparison treatment can be detected more than two years after the message was sent.

I. Experimental Design

The Cobb County Water System (CCWS), an agency of the Cobb County Government, distributes treated surface water to about 170,000 customers.[2] About 150,000 are residential customers that reside in single-family dwellings. CCWS obtains water from surface supplies that have been affected by periodic drought conditions since 1998. To reduce water use among its residential customers, the CCWS agreed to initiate a targeted, mail-based conservation education program in 2007 through a randomized experimental design.[3]

Treatment 1, the technical advice treatment, provided households with an "information-only" message: a two-sided "tip sheet" listing ways to most effectively reduce water use and whom to contact for more information. The information contained in the "tip sheet" was widely available prior to our intervention, but households may have been unaware of *all* the strategies highlighted in the message.

Treatment 2, the weak social norm treatment, augmented Treatment 1 by including a personally addressed letter to the household on official CCWS stationary. In addition to information found on the customer's month bill (and the tip sheet), the letter includes the following norm-based appeal:

> Cobb County residents consume almost one of out every ten gallons of Georgia's public water supply. As a result, our water use has a large impact on the ability of Georgia's waterways to protect wildlife and dilute pollutants that threaten human health. … We need your help. Act on the tips listed in the enclosed tip sheet. We all have to do our part to protect Cobb County's precious water resources. Reducing our water consumption today is important for preserving our environment and our economy for future generations. Please don't waste water. Remember: every drop counts!

Treatment 3, the strong social norm treatment, augmented Treatment 2 with a comparison of the household's water use to the median county household use for period June to October 2006, and indicated the percentile in which the household fell during this period. This comparison read:

> As we enter the summer months, we thought that you might be interested in the following information about your water consumption last year:
> **Your own total consumption June to October 2006: 52,000 gallons**
> *Your neighbors' average (median) consumption June to October 2006: 35,000 gallons*
> You consumed more water than 73 percent of your Cobb County neighbors.

Based on prior work from social psychology (see, e.g., Schultz et al. 2007), the percentile text was framed in a negative way emphasizing how many people do *not* engage in the targeted (undesirable) behavior.

Before we proceed to the results section, a few key features of the experimental design should be highlighted. First, the three treatment mailings were sent out on the same day during the week of 21 May 2007. All mailings were sent via first-class mail in official CCWS envelopes to maximize the likelihood that they would be opened by customers and to clearly

[2] Information about Cobb County can be viewed at http://quickfacts.census.gov/qfd/states/13/13067lk.html.

[3] The experimental design description follows Ferraro and Price (2009), who examine the short-run treatment effects.

associate the messages with CCWS. Our single treatment "dose" contrasts with the OPOWER treatments, which are sent monthly without cessation. Second, the social comparison treatment required the communication of baseline water use for summer 2006. Although the water system billed 156,326 residential customers in April 2007, this requirement limits the set of households that were eligible for treatment assignment to 139,693 households whose customer billing names had not changed between May 2006 and March 2007.

Third, under a nonrandomized conservation program, CCWS would not send messages to households that consume fewer than 4,000 gallons/month or use zero gallons for most of the summer water season. Households that met these criteria for May through September 2006 were excluded from the experiment. The final sample included 11,699 households assigned to Treatment 1, 11,695 households assigned to Treatment 2, 11,699 households assigned to Treatment 3, and 71,779 households assigned to the control condition.[4] Finally, monthly pre- and postexperiment water use data for the empirical analysis come from the CCWS billing department.

II. Experimental Results

We begin by examining the effect of our experimental treatments on household water use for June through September 2007. We regress summer 2007 water use for the *i*th household (Y_{i2007}) on three dummy variables representing the three treatments (T_1 = Technical Advice; T_2 = Weak Social Norms; T_3 = Strong Social Norms):

$$(1)\quad Y_{i2007} = \alpha + \beta_1 \times T_1 + \beta_2 \times T_2 + \beta_3 \times T_3 + \beta_4 \times Y_{i2006} + \beta_5 \times Y_{iSpring} + \varepsilon_i.$$

To increase the precision of our estimates, we include as covariates aggregate household water use for May through October 2006 (Y_{i2006}) and for March and April 2007 ($Y_{iSpring}$). This latter variable aims to capture any home or landscaping changes since 2006 but before the experiment began. Given evidence of heteroskedasticity, we estimate robust standard errors.

Empirical estimates (in thousands of gallons) are contained in Model A of Table 1 and are consonant with results from Ferraro and Price (2009). Norm-based messages provide an effective means to promote short-run conservation efforts. While technical advice has a small, and statistically insignificant, impact on water use, augmenting technical advice to include appeals to prosocial preferences or a social comparison generates substantially larger reductions.[5] For example, households assigned to our weak social norm treatment consume approximately 2.7 percent (990 gallons) less during the 2007 summer than those in the control group. Including a social comparison, as in the strong social norm treatment, leads to further reductions—approximately 4.8 percent (1,740 gallons). Importantly, both of these differences are significant at the $p < 0.01$ level and are robust to including route-specific dummy variables designed to capture unobserved neighborhood specific characteristics that may influence water consumption.

We now turn to evaluate the persistence of the three treatments over a two-year period following treatment assignment. Changing the dependent variable of equation (1), we regress water use for the 2008 and 2009 summers on our treatment dummies and household measures of preintervention water use. We again estimate robust standard errors. The final two columns of Table 1 present the empirical estimates, which suggest that the strong social norm treatment significantly affects water consumption in the two summers following treatment assignment. For example, as noted in column B, during the 2008 summer households assigned to the strong social norm treatment consumed approximately 638 gallons (or 2.6 percent) less, on average, than counterparts

[4] Ferraro and Price (2009) present evidence that the randomization was effective in terms of balancing baseline water consumption and observable covariate distributions across groups.

[5] Households in our technical advice treatment consume approximately 240 gallons or a half-percent less, on average, than counterparts in the control. To better understand the magnitude of such difference consider that the average shower uses approximately 15–24 gallons of water and the average top load washing machine uses approximately 40–45 gallons of water per load.

TABLE 1—AVERAGE TREATMENT EFFECT FOR SUMMER 2007, SUMMER 2008, SUMMER 2009
LINEAR REGRESSION MODEL

	Summer 2007 (A)	Summer 2008 (B)	Summer 2009 (C)
Treatment 1	−0.237	−0.0702	0.238
(Technical advice)	(0.193)	(0.167)	(0.170)
Treatment 2	−0.990***	−0.189	−0.0587
(Weak social norm)	(0.175)	(0.185)	(0.169)
Treatment 3	−1.739***	−0.638***	−0.349**
(Strong social norm)	(0.169)	(0.163)	(0.163)
Water use from June–November 2006	0.372***	0.128***	0.185***
	(0.0120)	(0.00912)	(0.0102)
Water use from April–May 2007	0.793***	0.426***	0.435***
	(0.0419)	(0.0239)	(0.0244)
Constant	2.185***	11.29***	9.762***
	(0.427)	(0.468)	(0.558)
Observations	106,669	106,669	106,669
R^2	0.618	0.229	0.318

Note: All water consumption variables are in thousands of gallons. Robust standard errors in parentheses.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

in the control group ($p < 0.01$). We observe similar, albeit less pronounced, effects during the summer 2009 season. As noted in Model C, households initially assigned to this treatment consume approximately 340 gallons (or 1.3 percent) less, on average, than counterparts in the control group ($p < 0.05$). In contrast, neither the weak social norm treatment nor the technical advice letter has an economically relevant or statistically significant impact on consumption in the 2008 or the 2009 summer seasons.

Viewed in their totality, our data suggest an important difference in the potential channels through which normative appeals and social comparisons affect water consumption. The fact that the weak social norm treatment effect is short-lived suggests that such messages do little more than induce behavioral adjustments (e.g., watering outdoors less frequently or washing full loads of laundry). In contrast, social comparisons have a more persistent effect on use, suggesting that such messages may promote both behavioral adjustments and durable conservation investments (e.g., fixing leaks, adopting water saving technologies).

III. Conclusions

Economists have only recently started to explore the effects of norm-based strategies, such as appeals to prosocial behavior or the use of social comparisons, as a means to promote prosocial behaviors. To date, this literature has focused exclusively on short-run effects. This study seeks to advance our understanding of such strategies by exploring whether and how they influence demand in *both* the short and long run. We do so by investigating the effectiveness of information transfers and prosocial messages in a large-scale, natural field experiment carried out in conjunction with a water utility system in metropolitan Atlanta.

Empirical results are striking and suggest a difference in the long-run impacts of prosocial appeals and social comparisons. While both strategies affect short-run water use, only messages augmented with social comparisons have a lasting impact on use. Within a year of the intervention, we are unable to detect a meaningful treatment effect for households that received an appeal to prosocial preferences but no social comparison. In contrast, impacts from the social

comparison treatment can be detected more than two years after the message was sent. From a policy perspective such differences are noteworthy and suggest that social comparisons hold greater promise for situations where the policymaker is interested in affecting behavioral change in both the short and long run.

The persistence of the social comparison treatment is also suggestive of different treatment mechanisms. In the context of energy and water consumption, users can adjust behaviors which require vigilance to maintain over time, or they can invest in durable technologies which require higher up-front fixed costs but lower variable costs. Our results are suggestive that simple appeals to prosocial preferences affect consumption through behavioral adjustments only, whereas social comparisons may affect behavior through both channels. Future research should focus on identifying the types of changes households undertake to better assess the long-run impacts of different norm-based strategies. Future research should also elucidate the short-run and long-run welfare implications of using norm-based strategies, a topic which is currently absent in the literature, but one which economists are well placed to address.

REFERENCES

Allcott, Hunt. 2010. "Social Norms and Energy Conservation." http://web.mit.edu/allcott/www/Allcott%202010%20-%20Social%20Norms%20and%20Energy%20Conservation.pdf.

Ayres, Ian, Sophie Raseman, and Alice Shih. 2009. "Evidence from Two Large Field Experiments That Peer Comparison Feedback Can Reduce Residential Energy Usage." National Bureau of Economic Research Working Paper 15386.

Ferraro, Paul J., and Michael K. Price. 2009. "Using Non-Pecuniary Strategies to Influence Behavior: Evidence from a Large Scale Field Experiment." http://www2.gsu.edu/~wwwcec/docs/CCWS_2010_revised.pdf.

Festinger, Leon. 1954. "A Theory of Social Comparison Processes." *Human Relations*, 7(2): 117–40.

Goldstein, Noah J., Robert B. Cialdini, and Vladas Griskevicius. 2008. "A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels." *Journal of Consumer Research*, 35(3): 472–82.

Kurz, Tim, Ngaire Donaghue, and Ian Walker. 2005. "Utilizing a Social-Ecological Framework to Promote Water and Energy Conservation: A Field Experiment." *Journal of Applied Social Psychology*, 35(6): 1281–1300.

Nolan, Jessica M., P. Wesley Schultz, Robert B. Cialdini, Noah J. Goldstein, and Vlada Griskevicius. 2008. "Normative Social Influence Is Underdetected." *Personality and Social Psychology Bulletin*, 34(7): 913–23.

Schultz, P. Wesley, Jessica M. Nolan, Robert B. Cialdini, Noah J. Goldstein, and Vladas Griskevicius. 2007. "The Constructive, Destructive, and Reconstructive Power of Social Norms." *Psychological Science*, 18(5): 429–34.

This article has been cited by:

1. Melissa Haeffner, Douglas Jackson-Smith, Matthew J. Barnett. 2023. Categorizing relative water use perception bias using household surveys and monthly water bills. *Journal of Environmental Management* **334**, 117443. [Crossref]
2. Peizhen Jin, Siyu Wang, Desheng Yin, Hang Zhang. 2023. Environmental institutional supply that shapes a green economy: Evidence from Chinese cities. *Technological Forecasting and Social Change* **187**, 122214. [Crossref]
3. Clò Stefano, Regiani Tommaso, Ruberto Sabrina. 2023. Consumption feedback and water saving: An experiment in the metropolitan area of Milan. *MUNI ECON Working Papers* **2**:2. . [Crossref]
4. Salvador Lurbé, Jesse Burkhardt, Chris Goemans, Dale Manning, Liesel Hans. 2023. Further evidence on social comparison and residential water use. *Water Resources and Economics* **41**, 100214. [Crossref]
5. Karolin Sjöö, Wolfgang Kaltenbrunner. 2022. Gender mainstreaming research funding: a study of effects on STEM research proposals. *Science and Public Policy* **44**. . [Crossref]
6. Santosh Pathak, Naveen C. Adusumilli, Hua Wang, Lal K. Almas. 2022. Irrigation water demand and elasticities: a case study of the High Plains aquifer. *Irrigation Science* **40**:6, 941-954. [Crossref]
7. Jonathan Baker, Lori Bennear, Sheila Olmstead. 2022. Does Information Disclosure Reduce Drinking Water Violations in the United States?. *Journal of the Association of Environmental and Resource Economists* **89**. . [Crossref]
8. Fredrik Carlsson, Mitesh Kataria, Elina Lampi, Erik Nyberg, Thomas Sterner. 2022. Red, yellow, or green? Do consumers' choices of food products depend on the label design?. *European Review of Agricultural Economics* **49**:5, 1005-1026. [Crossref]
9. Kayo Murakami, Hideki Shimada, Yoshiaki Ushifusa, Takanori Ida. 2022. HETEROGENEOUS TREATMENT EFFECTS OF NUDGE AND REBATE: CAUSAL MACHINE LEARNING IN A FIELD EXPERIMENT ON ELECTRICITY CONSERVATION. *International Economic Review* **63**:4, 1779-1803. [Crossref]
10. K.C. Payne Hirsch, Gabrielle Wong-Parodi, Ada Statler. 2022. Integrating norms into the logic of energy and environmental policymaking. *Energy Research & Social Science* **93**, 102828. [Crossref]
11. Yurina Otaki, Shuma Iwatani, Hidehito Honda, Kazuhiro Ueda. 2022. Using nudges for water demand management: A field experiment for water conservation. *PLOS Water* **1**:10, e0000057. [Crossref]
12. Miguel A. Meléndez-Jiménez, Antonio J. Morales, Javier Rodero Cosano. 2022. Engaging academic staff in the quality assurance system in higher education: A field experiment. *Journal of Behavioral and Experimental Economics* **100**, 101923. [Crossref]
13. Sara M. Constantino, Gregg Sparkman, Gordon T. Kraft-Todd, Cristina Bicchieri, Damon Centola, Bettina Shell-Duncan, Sonja Vogt, Elke U. Weber. 2022. Scaling Up Change: A Critical Review and Practical Guide to Harnessing Social Norms for Climate Action. *Psychological Science in the Public Interest* **23**:2, 50-97. [Crossref]
14. Jose Bolorinos, Ram Rajagopal, Newsha K Ajami. 2022. Do water savings persist? Using survival models to plan for long-term responses to extreme drought. *Environmental Research Letters* **17**:9, 094032. [Crossref]
15. Janaki Imbulana Arachchi, Shunsuke Managi. 2022. Social capital, household income and carbon dioxide emissions: A multicountry analysis. *Environmental Impact Assessment Review* **96**, 106838. [Crossref]
16. Maho Nakagawa, Mathieu Lefebvre, Anne Stenger. 2022. Long-lasting effects of incentives and social preference: A public goods experiment. *PLOS ONE* **17**:8, e0273014. [Crossref]

17. María Ángeles García-Valiñas, Sara Suárez-Fernández. 2022. Are Economic Tools Useful to Manage Residential Water Demand? A Review of Old Issues and Emerging Topics. *Water* **14**:16, 2536. [Crossref]
18. Marius Alt, Carlo Gallier. 2022. Incentives and intertemporal behavioral spillovers: A two-period experiment on charitable giving. *Journal of Economic Behavior & Organization* **200**, 959-972. [Crossref]
19. Samantha Burns, Adrienne Davidson, Linda White, Delaine Hampton, Michal Perlman. 2022. Information effects on parental choices for early childhood education and care. *Behavioural Public Policy* **14**, 1-23. [Crossref]
20. Hunt Allcott, Matthew Gentzkow, Lena Song. 2022. Digital Addiction. *American Economic Review* **112**:7, 2424-2463. [Abstract] [View PDF article] [PDF with links]
21. Maksym Polyakov, Benedict White. 2022. What is the least cost policy mix for nitrogen and phosphorous abatement in a rapidly urbanizing catchment?. *Water Resources and Economics* **39**, 100208. [Crossref]
22. Ramy Sedhom, Amanda L. Blackford, Arjun Gupta, Thomas J. Smith, Lawrence N. Shulman, Michael A. Carducci. 2022. Oncologist Peer Comparisons as a Behavioral Science Strategy to Improve Hospice Utilization. *JCO Oncology Practice* **18**:7, e1122-e1131. [Crossref]
23. Yijie Wang, Lei Xie, Shuang Li. 2022. The Use of Intergroup Social Comparison in Promoting Water Conservation: Evidence from a Survey Experiment in China. *International Journal of Environmental Research and Public Health* **19**:13, 7749. [Crossref]
24. Yurina Otaki, Asahi Maeda. 2022. Water-Saving Tips With a Visualized Indicator Related to the Environment. *Frontiers in Water* **4**. . [Crossref]
25. Cristina Bicchieri, Eugen Dimant. 2022. Nudging with care: the risks and benefits of social information. *Public Choice* **191**:3-4, 443-464. [Crossref]
26. Sumit Agarwal, Eduardo Araral, Mingxuan Fan, Yu Qin, Huanhuan Zheng. 2022. Water conservation through plumbing and nudging. *Nature Human Behaviour* **6**:6, 858-867. [Crossref]
27. Mark A. Andor, Andreas Gerster, Jörg Peters. 2022. Information campaigns for residential energy conservation. *European Economic Review* **144**, 104094. [Crossref]
28. Fumio Ohtake. 2022. Can nudges save lives?. *The Japanese Economic Review* **73**:2, 245-268. [Crossref]
29. Rebecca Afua Klege, Martine Visser, Saugato Datta, Matthew Darling. 2022. The Power of Nudging: Using Feedback, Competition, and Responsibility Assignment to Save Electricity in a Non-residential Setting. *Environmental and Resource Economics* **81**:3, 573-589. [Crossref]
30. Tycho M. A. Klessens, D. Daniel, Yong Jiang, Boris M. Van Breukelen, Lisa Scholten, Saket Pande. 2022. Combining Water Resources, Socioenvironmental, and Psychological Factors in Assessing Willingness to Conserve Groundwater in the Vietnamese Mekong Delta. *Journal of Water Resources Planning and Management* **148**:3. . [Crossref]
31. Marc Humbert, Xavier Lambin, Eric Villard. 2022. The role of prior warnings when cheating is easy and punishment is credible. *Information Economics and Policy* **58**, 100959. [Crossref]
32. Yurina Otaki, Hidehito Honda, Kazuhiro Ueda. 2022. What Are the Most Effective Neighborhood Ranges for Social Comparison to Improve Water Use Efficiency?. *Frontiers in Water* **4**. . [Crossref]
33. Jian ming Wang, Yong qiang Li. 2022. Soft Economic Incentives and Soft Behavioral Interventions on the Public's Green Purchasing Behaviour - The Evidence from China. *Psychology Research and Behavior Management* **Volume 15**, 2477-2499. [Crossref]
34. Jessica M. Nolan. 2021. Social norm interventions as a tool for pro-climate change. *Current Opinion in Psychology* **42**, 120-125. [Crossref]

35. Ganga Shreedhar, Matteo M. Galizzi. 2021. Personal or planetary health? Direct, spillover and carryover effects of non-monetary benefits of vegetarian behaviour. *Journal of Environmental Psychology* **78**, 101710. [Crossref]
36. Marc Humbert, Xavier Lambin. Chapitre 25. Examens à distance : des avertissements ciblés peuvent-ils décourager la tricherie ? 428-439. [Crossref]
37. Stefan Meyer, Paulo Santos, Fue Yang. 2021. Economic games can be used to promote cooperation in the field. *Proceedings of the National Academy of Sciences* **118**:47. . [Crossref]
38. Jeremy West, Robert W. Fairlie, Bryan Pratt, Liam Rose. 2021. Automated Enforcement of Irrigation Regulations and Social Pressure for Water Conservation. *Journal of the Association of Environmental and Resource Economists* **8**:6, 1179-1207. [Crossref]
39. Kenneth T. Gillingham, Bryan Bollinger. 2021. Social Learning and Solar Photovoltaic Adoption. *Management Science* **67**:11, 7091-7112. [Crossref]
40. Mohammad Ghoreishi, Razi Sheikholeslami, Amin Elshorbagy, Saman Razavi, Kenneth Belcher. 2021. Peering into agricultural rebound phenomenon using a global sensitivity analysis approach. *Journal of Hydrology* **602**, 126739. [Crossref]
41. Stijn Brouwer, Nicolien van Aalderen, Steven Hendrik Andreas Koop. 2021. Assessing tap water awareness: The development of an empirically-based framework. *PLOS ONE* **16**:10, e0259233. [Crossref]
42. Katrina Jessoe, Gabriel E. Lade, Frank Loge, Edward Spang. 2021. Residential water conservation during drought: Experimental evidence from three behavioral interventions. *Journal of Environmental Economics and Management* **110**, 102519. [Crossref]
43. Christina Gravert, Linus Olsson Collentine. 2021. When nudges aren't enough: Norms, incentives and habit formation in public transport usage. *Journal of Economic Behavior & Organization* **190**, 1-14. [Crossref]
44. Felix Kölle, Simone Quercia. 2021. The influence of empirical and normative expectations on cooperation. *Journal of Economic Behavior & Organization* **190**, 691-703. [Crossref]
45. Cynthia McPherson Frantz, John Petersen, Kathryn Lucaites. 2021. Novel approach to delivering pro-environmental messages significantly shifts norms and motivation, but children are not more effective spokespeople than adults. *PLOS ONE* **16**:9, e0255457. [Crossref]
46. Fredrik Carlsson, Marcela Jaime, Clara Villegas. 2021. Behavioral spillover effects from a social information campaign. *Journal of Environmental Economics and Management* **109**, 102325. [Crossref]
47. Matthias Buchholz, Oliver Musshoff. 2021. Tax or green nudge? An experimental analysis of pesticide policies in Germany. *European Review of Agricultural Economics* **48**:4, 940-982. [Crossref]
48. Dietrich Earnhart, Paul J. Ferraro. 2021. The Effect of Peer Comparisons on Polluters: A Randomized Field Experiment among Wastewater Dischargers. *Environmental and Resource Economics* **79**:4, 627-652. [Crossref]
49. Cristina Bicchieri, Eugen Dimant, Erte Xiao. 2021. Deviant or wrong? The effects of norm information on the efficacy of punishment. *Journal of Economic Behavior & Organization* **188**, 209-235. [Crossref]
50. Serhiy Kandul, Bruno Lanz. 2021. Public good provision, in-group cooperation and out-group descriptive norms: A lab experiment. *Journal of Economic Psychology* **85**, 102382. [Crossref]
51. Main Uddin, Liang Choon Wang, Russell Smyth. 2021. Do government-initiated energy comparison sites encourage consumer search and lower prices? Evidence from an online randomized controlled experiment in Australia. *Journal of Economic Behavior & Organization* **188**, 167-182. [Crossref]

52. Jacopo Bonan, Cristina Cattaneo, Giovanna d'Adda, Massimo Tavoni. 2021. Can social information programs be more effective? The role of environmental identity for energy conservation. *Journal of Environmental Economics and Management* **108**, 102467. [Crossref]
53. George Joseph, Sophie Ayling, Pepita Miquel-Florensa, Hernán D. Bejarano, Alejandra Quevedo Cardona. Behavioral Insights in Infrastructure Sectors: A Survey **25**, . [Crossref]
54. Vivek Vivek, Deepak Malghan, Kanchan Mukherjee. 2021. Toward achieving persistent behavior change in household water conservation. *Proceedings of the National Academy of Sciences* **118**:24. . [Crossref]
55. Nicolai Heinz, Ann-Kathrin Koessler. 2021. Other-regarding preferences and pro-environmental behaviour: An interdisciplinary review of experimental studies. *Ecological Economics* **184**, 106987. [Crossref]
56. Angela J. Dean, Sarah Kneebone, Fraser Tull, Nita Lauren, Liam D.G. Smith. 2021. 'Stickiness' of water-saving behaviours: What factors influence whether behaviours are maintained or given up?. *Resources, Conservation and Recycling* **169**, 105531. [Crossref]
57. Fredrik Carlsson, Christina Gravert, Olof Johansson-Stenman, Verena Kurz. 2021. The Use of Green Nudges as an Environmental Policy Instrument. *Review of Environmental Economics and Policy* **15**:2, 216-237. [Crossref]
58. Jessica M. Nolan, Kenneth E. Wallen. Social Norms and Persuasion 404-421. [Crossref]
59. Seyed M. K. Sadr, Line T. That, Will Ingram, Fayyaz A. Memon. 2021. Simulating the impact of water demand management options on water consumption and wastewater generation profiles. *Urban Water Journal* **18**:5, 320-333. [Crossref]
60. Aja Ropret Homar, Ljubica Knežević Cvelbar. 2021. The effects of framing on environmental decisions: A systematic literature review. *Ecological Economics* **183**, 106950. [Crossref]
61. James R. Meldrum, Hannah Brenkert-Smith, Patricia A. Champ, Jamie Gomez, Hilary Byerly, Lilia Falk, Christopher M. Barth. 2021. Would you like to know more? The effect of personalized wildfire risk information and social comparisons on information-seeking behavior in the wildland–urban interface. *Natural Hazards* **106**:3, 2139-2161. [Crossref]
62. Martine Visser, M.J. Booysen, Johanna M. Brühl, Kenneth J. Berger. 2021. Saving water at Cape Town schools by using smart metering and behavioral change. *Water Resources and Economics* **34**, 100175. [Crossref]
63. Alemu Mekonnen, Sied Hassen, Marcela Jaime, Michael A. Toman, Xiao-Bing Zhang. The Effect of Information and Subsidy Measures on Adoption of Solar Lanterns: An Application of the BDM Bidding Mechanism in Rural Ethiopia **39**, . [Crossref]
64. Déborah Martínez, Cristina Parilli, Carlos Scartascini, Alberto Simpser. 2021. Let's (not) get together! The role of social norms on social distancing during COVID-19. *PLOS ONE* **16**:3, e0247454. [Crossref]
65. Ukasha Ramli. 2021. Social Norms Based Eco-Feedback for Household Water Consumption. *Sustainability* **13**:5, 2796. [Crossref]
66. Philippe Le Coent, Raphaële Préget, Sophie Thoyer. 2021. Farmers Follow the Herd: A Theoretical Model on Social Norms and Payments for Environmental Services. *Environmental and Resource Economics* **78**:2, 287-306. [Crossref]
67. Ioana Bejan, Carsten Lynge Jensen, Laura M. Andersen, Lars Gårn Hansen. 2021. Inducing flexibility of household electricity demand: The overlooked costs of reacting to dynamic incentives. *Applied Energy* **284**, 116283. [Crossref]

68. Nicolas Caballero, Nives Della Valle. 2021. Tackling Energy Poverty Through Behavioral Change: A Pilot Study on Social Comparison Interventions in Social Housing Districts. *Frontiers in Sustainable Cities* **2**. . [Crossref]
69. Qian Xu, Yujie Lu, Bon-Gang Hwang. Effectiveness of Innovative Intervention—Household Energy Saving Option (HESO) on Promoting Energy Conservation in Residential Buildings 1801-1817. [Crossref]
70. Théo Konc, Ivan Savin, Jeroen C.J.M. van den Bergh. 2021. The social multiplier of environmental policy: Application to carbon taxation. *Journal of Environmental Economics and Management* **105**, 102396. [Crossref]
71. Kris Hartley, Nicole Sher Wen Lim, Cecilia Tortajada. 2021. Policy Note: Digital Feedback-Based Interventions for Water Conservation. *Water Economics and Policy* **07**:01. . [Crossref]
72. Sania Ashraf, Cristina Bicchieri, Maryann G Delea, Upasak Das, Kavita Chauhan, Jinyi Kuang, Alex Shpenev, Erik Thulin. 2021. Norms and Social Network–Centric Behavior Change Intervention (Nam Nalavazhvu) for Improved Toilet Usage in Peri-Urban Communities of Tamil Nadu: Protocol for a Cluster-Randomized Controlled Trial. *JMIR Research Protocols* **10**:5, e24407. [Crossref]
73. Ha Thu Vu, Duc Tran, Daisaku Goto, Keisuke Kawata. 2020. Does experience sharing affect farmers' pro-environmental behavior? A randomized controlled trial in Vietnam. *World Development* **136**, 105062. [Crossref]
74. Daniel A. Brent, Corey Lott, Michael Taylor, Joseph Cook, Kimberly Rollins, Shawn Stoddard. 2020. What Causes Heterogeneous Responses to Social Comparison Messages for Water Conservation?. *Environmental and Resource Economics* **77**:3, 503-537. [Crossref]
75. Giovanna d'Adda, Martin Dufwenberg, Francesco Passarelli, Guido Tabellini. 2020. Social norms with private values: Theory and experiments. *Games and Economic Behavior* **124**, 288-304. [Crossref]
76. Zhijian Zhang, Xueyuan Wang. 2020. Nudging to promote household waste source separation: Mechanisms and spillover effects. *Resources, Conservation and Recycling* **162**, 105054. [Crossref]
77. Liang Lu. 2020. Information-based interventions for household water efficiency in England and Wales: evidence, barriers and learning opportunities. *International Journal of Water Resources Development* **36**:6, 926-939. [Crossref]
78. Jacopo Bonan, Cristina Cattaneo, Giovanna d'Adda, Massimo Tavoni. 2020. The interaction of descriptive and injunctive social norms in promoting energy conservation. *Nature Energy* **5**:11, 900-909. [Crossref]
79. Jose Bolorinos, Ram Rajagopal, Newsha K. Ajami. 2020. Mining the gap in long-term residential water and electricity conservation. *Environmental Research Letters* . [Crossref]
80. Bonnie L. Keeler. 2020. Mainstream and Heterodox Approaches to Water Quality Valuation: A Case for Pluralistic Water Policy Analysis. *Annual Review of Resource Economics* **12**:1, 235-258. [Crossref]
81. Hemawathy Balarama, Asad Islam, Jun Sung Kim, Liang Choon Wang. 2020. Price elasticities of residential electricity demand: Estimates from household panel data in Bangladesh. *Energy Economics* **92**, 104937. [Crossref]
82. Brantley Liddle, Tian Sheng Allan Loi, Anthony D. Owen, Jacqueline Tao. 2020. Evaluating consumption and cost savings from new air-conditioner purchases: The case of Singapore. *Energy Policy* **145**, 111722. [Crossref]
83. Arnab Mitra, Quazi Shahriar. 2020. Why is dishonesty difficult to mitigate? The interaction between descriptive norm and monetary incentive. *Journal of Economic Psychology* **80**, 102292. [Crossref]
84. Riccardo Marzano, Charles Rougé, Paola Garrone, Julien J. Harou, Manuel Pulido-Velazquez. 2020. Response of residential water demand to dynamic pricing: Evidence from an online experiment. *Water Resources and Economics* **32**, 100169. [Crossref]

85. Wenjie Wang, Takanori Ida, Hideki Shimada. 2020. Default effect versus active decision: Evidence from a field experiment in Los Alamos. *European Economic Review* **128**, 103498. [Crossref]
86. Steve Miller. 2020. Causal forest estimation of heterogeneous and time-varying environmental policy effects. *Journal of Environmental Economics and Management* **103**, 102337. [Crossref]
87. Mark A. Andor, Andreas Gerster, Jörg Peters, Christoph M. Schmidt. 2020. Social Norms and Energy Conservation Beyond the US. *Journal of Environmental Economics and Management* **103**, 102351. [Crossref]
88. F. Alpizar, F. Carlsson, G. Lanza, B. Carney, R.C. Daniels, M. Jaime, T. Ho, Z. Nie, C. Salazar, B. Tibesigwa, S. Wahdera. 2020. A framework for selecting and designing policies to reduce marine plastic pollution in developing countries. *Environmental Science & Policy* **109**, 25-35. [Crossref]
89. Yurina Otaki, Hidehito Honda, Kazuhiro Ueda. 2020. Water demand management: Visualising a public good. *PLOS ONE* **15**:6, e0234621. [Crossref]
90. Dilek Uz, Steven Buck. 2020. Comparing Water Use Forecasting Model Selection Criteria: The Case of Commercial, Institutional, and Industrial Sector in Southern California. *Sustainability* **12**:10, 3995. [Crossref]
91. Matthew J. Barnett, Douglas Jackson-Smith, Joanna Endter-Wada, Melissa Haeffner. 2020. A multilevel analysis of the drivers of household water consumption in a semi-arid region. *Science of The Total Environment* **712**, 136489. [Crossref]
92. Hugh Sibly. 2020. Urban water policy when environment inflows are uncertain. *Water Resources and Economics* **30**, 100149. [Crossref]
93. Mark Andor, Gunther Bensch, Katja Fels, Nadine Kneppel. 2020. Per Stups zum Energiesparen?. *Perspektiven der Wirtschaftspolitik* **20**:4, 352-382. [Crossref]
94. Serhiy Kandul, Ghislaine Lang, Bruno Lanz. 2020. Social comparison and energy conservation in a collective action context: A field experiment. *Economics Letters* **188**, 108947. [Crossref]
95. Guillermo Ignacio Acuña, Cristián Echeverría, Alex Godoy, Felipe Vásquez. 2020. The role of climate variability in convergence of residential water consumption across Chilean localities. *Environmental Economics and Policy Studies* **22**:1, 89-108. [Crossref]
96. Steven Buck, Maximilian Auffhammer, Hilary Soldati, David Sunding. 2020. Forecasting Residential Water Consumption in California: Rethinking Model Selection. *Water Resources Research* **56**:1. . [Crossref]
97. Julianna M. Butler, Jacob R. Fooks, Kent D. Messer, Leah H. Palm-Forster. 2020. ADDRESSING SOCIAL DILEMMAS WITH MASCOTS, INFORMATION, AND GRAPHICS. *Economic Inquiry* **58**:1, 150-168. [Crossref]
98. Eugen Dimant, Tobias Gesche. 2020. Nudging Enforcers: How Norm Perceptions and Motives for Lying Shape Sanctions. *SSRN Electronic Journal* **113**. . [Crossref]
99. Claudia F. Nisa, Jocelyn J. Bélanger, Birga M. Schumpe, Daiane G. Faller. 2019. Meta-analysis of randomised controlled trials testing behavioural interventions to promote household action on climate change. *Nature Communications* **10**:1. . [Crossref]
100. Valerio Capraro, Glorianna Jagfeld, Rana Klein, Mathijs Mul, Iris van de Pol. 2019. Increasing altruistic and cooperative behaviour with simple moral nudges. *Scientific Reports* **9**:1. . [Crossref]
101. Benjamin Ouvrard. 2019. Les nudges pour améliorer l'environnement en économie publique. *Revue française d'économie* **Vol. XXXIV**:2, 3-60. [Crossref]
102. Magnus Bergquist, Andreas Nilsson, Wesley P. Schultz. 2019. A meta-analysis of field-experiments using social norms to promote pro-environmental behaviors. *Global Environmental Change* **59**, 101941. [Crossref]

103. Daniel A. Brent, Michael B. Ward. 2019. Price perceptions in water demand. *Journal of Environmental Economics and Management* **98**, 102266. [Crossref]
104. Mikołaj Czajkowski, Katarzyna Zagórska, Nick Hanley. 2019. Social norm nudging and preferences for household recycling. *Resource and Energy Economics* **58**, 101110. [Crossref]
105. Eszter Czibor, David Jimenez-Gomez, John A. List. 2019. The Dozen Things Experimental Economists Should Do (More of). *Southern Economic Journal* **86**:2, 371-432. [Crossref]
106. S.H.A. Koop, A.J. Van Dorssen, S. Brouwer. 2019. Enhancing domestic water conservation behaviour: A review of empirical studies on influencing tactics. *Journal of Environmental Management* **247**, 867-876. [Crossref]
107. Nives DellaValle, Alyona Zubaryeva. 2019. Can we hope for a collective shift in electric vehicle adoption? Testing salience and norm-based interventions in South Tyrol, Italy. *Energy Research & Social Science* **55**, 46-61. [Crossref]
108. Wesley Schultz, Shahram Javey, Alla Sorokina. 2019. Social Comparison as a Tool to Promote Residential Water Conservation. *Frontiers in Water* **1**. . [Crossref]
109. Leah H. Palm-Forster, Paul J. Ferraro, Nicholas Janusch, Christian A. Vossler, Kent D. Messer. 2019. Behavioral and Experimental Agri-Environmental Research: Methodological Challenges, Literature Gaps, and Recommendations. *Environmental and Resource Economics* **73**:3, 719-742. [Crossref]
110. Natalia V. Czap, Hans J. Czap, Simanti Banerjee, Mark E. Burbach. 2019. Encouraging farmers' participation in the Conservation Stewardship Program: A field experiment. *Ecological Economics* **161**, 130-143. [Crossref]
111. François J Dessart, Jesús Barreiro-Hurlé, René van Bavel. 2019. Behavioural factors affecting the adoption of sustainable farming practices: a policy-oriented review. *European Review of Agricultural Economics* **46**:3, 417-471. [Crossref]
112. Sylvain Chabé-Ferret, Philippe Le Coent, Arnaud Reynaud, Julie Subervie, Daniel Lepercq. 2019. Can we nudge farmers into saving water? Evidence from a randomised experiment. *European Review of Agricultural Economics* **46**:3, 393-416. [Crossref]
113. Céline Nauges, Dale Whittington. 2019. Social Norms Information Treatments in the Municipal Water Supply Sector: Some New Insights on Benefits and Costs. *Water Economics and Policy* **05**:03, 1850026. [Crossref]
114. Scott Holladay, Jacob LaRiviere, David Novgorodsky, Michael Price. 2019. Prices versus nudges: What matters for search versus purchase of energy investments?. *Journal of Public Economics* **172**, 151-173. [Crossref]
115. Yurina Otaki, Hidehito Honda, Kazuhiro Ueda. 2019. Historical Self-Comparison of Water Consumption as a Water Demand Management Tool. *Water* **11**:4, 844. [Crossref]
116. Valeria Fanghella, Giovanna d'Adda, Massimo Tavoni. 2019. On the Use of Nudges to Affect Spillovers in Environmental Behaviors. *Frontiers in Psychology* **10**. . [Crossref]
117. Liang Lu, David Deller, Morten Hviid. 2019. Price and Behavioural Signals to Encourage Household Water Conservation: Implications for the UK. *Water Resources Management* **33**:2, 475-491. [Crossref]
118. Eszter Czibor, David Jimenez-Gomez, John A. List. 2019. The Dozen Things Experimental Economists Should Do (More Of). *SSRN Electronic Journal* **23**. . [Crossref]
119. Cristina Bicchieri, Eugen Dimant. 2019. Nudging with Care: The Risks and Benefits of Social Information. *SSRN Electronic Journal* . [Crossref]
120. Yipu Deng, Jinyang Zheng, Liqiang Huang, Karthik Natarajan Kannan. 2019. Let Artificial Intelligence Be Your Shelf Watchdog: The Impact of AI-powered Shelf Monitoring on Product Sales. *SSRN Electronic Journal* . [Crossref]

121. Fredrik Carlsson, Christina Annette Gravert, Verena Kurz, Olof Johansson-Stenman. 2019. Nudging as an Environmental Policy Instrument. *SSRN Electronic Journal* **95**. . [Crossref]

122. Quinn Keefer, Galib Rustamov. 2018. Limited attention in residential energy markets: a regression discontinuity approach. *Empirical Economics* **55**:3, 993-1017. [Crossref]

123. Denis Hilton, Nicolas Treich, Gaetan Lazzara, Philippe Tendil. 2018. Designing effective nudges that satisfy ethical constraints: the case of environmentally responsible behaviour. *Mind & Society* **17**:1-2, 27-38. [Crossref]

124. Mónica M. Jaime Torres, Fredrik Carlsson. 2018. Direct and spillover effects of a social information campaign on residential water-savings. *Journal of Environmental Economics and Management* **92**, 222-243. [Crossref]

125. Nicolas Astier. 2018. Comparative feedbacks under incomplete information. *Resource and Energy Economics* **54**, 90-108. [Crossref]

126. Ruthanne Huising, Susan S. Silbey. 2018. From Nudge to Culture and Back Again: Coalface Governance in the Regulated Organization. *Annual Review of Law and Social Science* **14**:1, 91-114. [Crossref]

127. Ken Sinclair-Smith, Susan Mosdell, Gisela Kaiser, Ziyaad Lalla, Leandre September, Collin Mubadiro, Sarah Rushmere, Katherine Roderick, Johanna Brühl, Megan McLaren, Martine Visser. 2018. City of Cape Town's Water Map. *Journal - American Water Works Association* **110**:9, 62-66. [Crossref]

128. Adam C. Landon, Richard T. Woodward, Gerard T. Kyle, Ronald A. Kaiser. 2018. Evaluating the efficacy of an information-based residential outdoor water conservation program. *Journal of Cleaner Production* **195**, 56-65. [Crossref]

129. Ayilnagarajan Ramesh, Mookkappan Sudhagar, Mark Christopher Arokiaraj, Basheer Aneesh, Iqbal Nayyar. 2018. A STUDY OF BLOOD LEAD LEVELS IN YOUNG HYPERTENSIVE PATIENTS. *Journal of Evidence Based Medicine and Healthcare* **5**:35, 2567-2570. [Crossref]

130. Carmine Ornaghi, Enrico Costanza, Jacob Kittley-Davies, Leonidas Bourikas, Victoria Aragon, Patrick A.B. James. 2018. The effect of behavioural interventions on energy conservation in naturally ventilated offices. *Energy Economics* **74**, 582-591. [Crossref]

131. Verena Kurz. 2018. Nudging to reduce meat consumption: Immediate and persistent effects of an intervention at a university restaurant. *Journal of Environmental Economics and Management* **90**, 317-341. [Crossref]

132. Kenneth Gillingham, Tsvetan Tsvetanov. 2018. Nudging energy efficiency audits: Evidence from a field experiment. *Journal of Environmental Economics and Management* **90**, 303-316. [Crossref]

133. Hailey Hayeon Joo, Jungmin Lee, Sangkon Park. 2018. EVERY DROP COUNTS: A WATER CONSERVATION EXPERIMENT WITH HOTEL GUESTS. *Economic Inquiry* **56**:3, 1788-1808. [Crossref]

134. Mark A. Andor, Katja M. Fels. 2018. Behavioral Economics and Energy Conservation – A Systematic Review of Non-price Interventions and Their Causal Effects. *Ecological Economics* **148**, 178-210. [Crossref]

135. Nicholas Biddle, Katja M. Fels, Mathias Sinning. 2018. Behavioral insights on business taxation: Evidence from two natural field experiments. *Journal of Behavioral and Experimental Finance* **18**, 30-49. [Crossref]

136. Todd Rogers, Avi Feller. 2018. Reducing student absences at scale by targeting parents' misbeliefs. *Nature Human Behaviour* **2**:5, 335-342. [Crossref]

137. Grazia Cecere, Nick Johnstone, Gionata Castaldi. 2018. Information and rewards: results of a field experiment on printing activity. *Journal of Environmental Economics and Policy* **7**:2, 117-129. [Crossref]

138. Zachary S. Brown. 2018. Voluntary Programs To Encourage Refuges for Pesticide Resistance Management: Lessons from a Quasi-Experiment. *American Journal of Agricultural Economics* **100**:3, 844-867. [Crossref]

139. Madhu Khanna, Scott M Swinton, Kent D Messer. 2018. Sustaining our Natural Resources in the Face of Increasing Societal Demands on Agriculture: Directions for Future Research. *Applied Economic Perspectives and Policy* **40**:1, 38-59. [Crossref]

140. Koichiro Ito, Takanori Ida, Makoto Tanaka. 2018. Moral Suasion and Economic Incentives: Field Experimental Evidence from Energy Demand. *American Economic Journal: Economic Policy* **10**:1, 240-267. [Abstract] [View PDF article] [PDF with links]

141. Alia M. Dietsch, Kristina M. Slagle, Sharon Baruch-Mordo, Stewart W. Breck, Lana M. Ciarniello. 2018. Education is not a panacea for reducing human–black bear conflicts. *Ecological Modelling* **367**, 10-12. [Crossref]

142. Ante Busic-Sontic, Franz Fuerst. 2018. Does your personality shape your reaction to your neighbours' behaviour? A spatial study of the diffusion of solar panels. *Energy and Buildings* **158**, 1275-1285. [Crossref]

143. Cassandra Telenko, Nicholas Benzoni. 2018. Life Cycle Tradeoffs in a Feedback Device for Reducing Water Consumption. *Procedia CIRP* **69**, 615-620. [Crossref]

144. Koichiro Ito, Takanori Ida, Makoto Tanaka. 2018. Moral Suasion and Economic Incentives: Field Experimental Evidence from Energy Demand. *SSRN Electronic Journal* . [Crossref]

145. Mark Andor, Andreas Gerster, Jörg Peters, Christoph M. Schmidt. 2018. Social Norms and Energy Conservation Beyond the US. *SSRN Electronic Journal* **23**. . [Crossref]

146. Claudia Nisa. 2018. Red Alert on Green Behavior: Meta-Analysis of Field Experiments to Promote Sustainability. *SSRN Electronic Journal* . [Crossref]

147. Wenbo Zou. 2018. Motivated Belief Updating of Norms: Theory and Experimental Evidence. *SSRN Electronic Journal* . [Crossref]

148. Eugen Dimant, Cristina Bicchieri, Erte Xiao. 2018. Deviant or Wrong? The Effects of Norm Information on the Efficacy of Punishment. *SSRN Electronic Journal* . [Crossref]

149. Cristina Bicchieri, Eugen Dimant, Erte Xiao. 2018. Deviant or Wrong? The Effects of Norm Information on the Efficacy of Punishment. *SSRN Electronic Journal* **8**. . [Crossref]

150. Jana Gallus. 2017. Fostering Public Good Contributions with Symbolic Awards: A Large-Scale Natural Field Experiment at Wikipedia. *Management Science* **63**:12, 3999-4015. [Crossref]

151. Claudia Nisa, Celeste Varum, Anabela Botelho. 2017. Promoting Sustainable Hotel Guest Behavior: A Systematic Review and Meta-Analysis. *Cornell Hospitality Quarterly* **58**:4, 354-363. [Crossref]

152. Alexander Pfaff, Juan Robalino. 2017. Spillovers from Conservation Programs. *Annual Review of Resource Economics* **9**:1, 299-315. [Crossref]

153. Katherine Farrow, Gilles Grolleau, Lisette Ibanez. 2017. Social Norms and Pro-environmental Behavior: A Review of the Evidence. *Ecological Economics* **140**, 1-13. [Crossref]

154. Syon P. Bhanot. 2017. Rank and response: A field experiment on peer information and water use behavior. *Journal of Economic Psychology* **62**, 155-172. [Crossref]

155. John Kerr, Maria Lapinski, Rain Liu, Jinhua Zhao. 2017. Long-Term Effects of Payments for Environmental Services: Combining Insights from Communication and Economics. *Sustainability* **9**:9, 1627. [Crossref]

156. Martin Kesternich, Christiane Reif, Dirk Rübbelke. 2017. Recent Trends in Behavioral Environmental Economics. *Environmental and Resource Economics* **67**:3, 403-411. [Crossref]

157. Steven Wallander, Paul Ferraro, Nathaniel Higgins. 2017. Addressing Participant Inattention in Federal Programs: A Field Experiment with the Conservation Reserve Program. *American Journal of Agricultural Economics* **99**:4, 914-931. [Crossref]

158. Paul J. Ferraro, Juan José Miranda. 2017. Panel Data Designs and Estimators as Substitutes for Randomized Controlled Trials in the Evaluation of Public Programs. *Journal of the Association of Environmental and Resource Economists* **4**:1, 281-317. [Crossref]

159. Bruno Wichmann, Martin Luckert, Katrina Bissonnette, Alyssa Cumberland, Claire Doll, Tanishka Gupta, Yuan Shi. 2017. Using Pro-Environmental Information to Modify Conservation Behavior: Paper Recycling and Reuse. *Recycling* **2**:1, 5. [Crossref]

160. Yurina Otaki, Kazuhiro Ueda, Osamu Sakura. 2017. Effects of feedback about community water consumption on residential water conservation. *Journal of Cleaner Production* **143**, 719-730. [Crossref]

161. Franziska Weber, Hans-Bernd Schaefer. 2017. 'Nudging', ein Spross der Verhaltensskonomie - berlegungen zum Liberalen Paternalismus auf Gesetzgeberischer Ebene ('Nudging', the Vehicle of Behavioural Economics - Some Thoughts on Libertarian Paternalism). *SSRN Electronic Journal* . [Crossref]

162. Nicholas Biddle, Katja Fels, Mathias Sinning. 2017. Behavioural Insights and Business Taxation: Evidence from Two Randomized Controlled Trials. *SSRN Electronic Journal* . [Crossref]

163. Sareh Vosooghi. 2017. Information Design in Coalition Formation Games. *SSRN Electronic Journal* . [Crossref]

164. Kenneth Gillingham, Tsvetan Tsvetanov. 2017. Nudging Energy Efficiency Audits: Evidence from A Field Experiment. *SSRN Electronic Journal* . [Crossref]

165. Daniel Brent, Lata Gangadharan, Anca Mihut, Marie Claire Villeval. 2017. Taxation, Redistribution and Observability in Social Dilemmas. *SSRN Electronic Journal* . [Crossref]

166. Valerio Capraro, Glorianna Jagfeld, Rana Klein, Mathijs Mul, Iris van de Pol. 2017. What's the Right Thing to Do? Increasing Pro-Sociality with Simple Moral Nudges. *SSRN Electronic Journal* **46**. . [Crossref]

167. Jason Delaney, Sarah Jacobson. 2016. Payments or Persuasion: Common Pool Resource Management with Price and Non-price Measures. *Environmental and Resource Economics* **65**:4, 747-772. [Crossref]

168. Anne Kejser. 2016. European attitudes to water pricing: Internalizing environmental and resource costs. *Journal of Environmental Management* **183**, 453-459. [Crossref]

169. Anders L. Sønderlund, Joanne R. Smith, Christopher J. Hutton, Zoran Kapelan, Dragan Savic. 2016. Effectiveness of Smart Meter-Based Consumption Feedback in Curbing Household Water Use: Knowns and Unknowns. *Journal of Water Resources Planning and Management* **142**:12. . [Crossref]

170. David Katz, Amir Grinstein, Ann Kronrod, Udi Nisan. 2016. Evaluating the effectiveness of a water conservation campaign: Combining experimental and field methods. *Journal of Environmental Management* **180**, 335-343. [Crossref]

171. Gilles Grolleau, Lisette Ibanez, Naoufel Mzoughi, Mario Teisl. 2016. Helping eco-labels to fulfil their promises. *Climate Policy* **16**:6, 792-802. [Crossref]

172. Maura C. Allaire. 2016. Using practical and social information to influence flood adaptation behavior. *Water Resources Research* **52**:8, 6078-6093. [Crossref]

173. John A. List, Michael K. Price. 2016. The Use of Field Experiments in Environmental and Resource Economics. *Review of Environmental Economics and Policy* **10**:2, 206-225. [Crossref]

174. Linda Cambon. 2016. Le nudge en prévention... troisième voie ou sortie de route ?. *Santé Publique* **Vol. 28**:1, 43-48. [Crossref]

175. Juliette Richetin, Marco Perugini, Denny Mondini, Robert Hurling. 2016. Conserving Water While Washing Hands. *Environment and Behavior* **48**:2, 343-364. [Crossref]

176. Andrew Meyer, Guanyi Yang. 2016. How much versus who: which social norms information is more effective?. *Applied Economics* **48**:5, 389-401. [Crossref]

177. Dale T. Miller, Deborah A. Prentice. 2016. Changing Norms to Change Behavior. *Annual Review of Psychology* **67**:1, 339-361. [Crossref]

178. Nicholas Benzoni, Cassandra Telenko. A Review of Intervention Studies Aimed at Domestic Water Conservation 427-438. [Crossref]

179. Kathy Baylis, Jordi Honey-Rosés, Jan Börner, Esteve Corbera, Driss Ezzine-de-Blas, Paul J. Ferraro, Renaud Lapeyre, U. Martin Persson, Alex Pfaff, Sven Wunder. 2016. Mainstreaming Impact Evaluation in Nature Conservation. *Conservation Letters* **9**:1, 58-64. [Crossref]

180. Claudia Fernandes, Renate Schubert. 2016. Grand Challenge, Limited Evidence: The Effect of Non-Monetary Interventions to Promote Pro-Environmental Consumer Behavior. *SSRN Electronic Journal* . [Crossref]

181. Mehdi Nemati, Steven Buck, Hilary Soldati. 2016. The Effect of Social and Consumption Analytics on Residential Water Demand. *SSRN Electronic Journal* . [Crossref]

182. Takanori Ida, Kayo Murakami, Makoto Tanaka. 2016. Electricity demand response in Japan: Experimental evidence from a residential photovoltaic power-generation system. *Economics of Energy & Environmental Policy* **5**:1. . [Crossref]

183. Todd Rogers, Erin Frey. Changing Behavior Beyond the Here and Now 723-748. [Crossref]

184. Caroline Golin, Matt Cox, Marilyn Brown, Valerie Thomas. 2015. The water efficiency gap. *Sustainable Water Resources Management* **1**:4, 315-324. [Crossref]

185. Daniel A. Brent, Joseph H. Cook, Skylar Olsen. 2015. Social Comparisons, Household Water Use, and Participation in Utility Conservation Programs: Evidence from Three Randomized Trials. *Journal of the Association of Environmental and Resource Economists* **2**:4, 597-627. [Crossref]

186. James J. Murphy, Nomin Batmunkh, Benjamin Nilsson, Samantha Ray. The Impact of Social Information on the Voluntary Provision of Public Goods: A Replication Study 41-50. [Crossref]

187. Takuji W. Tsusaka, Kei Kajisa, Valerien O. Pede, Keitaro Aoyagi. 2015. Neighborhood effects and social behavior: The case of irrigated and rainfed farmers in Bohol, the Philippines. *Journal of Economic Behavior & Organization* **118**, 227-246. [Crossref]

188. Felix Ebeling, Sebastian Lotz. 2015. Domestic uptake of green energy promoted by opt-out tariffs. *Nature Climate Change* **5**:9, 868-871. [Crossref]

189. Koichiro Ito. 2015. Asymmetric Incentives in Subsidies: Evidence from a Large-Scale Electricity Rebate Program. *American Economic Journal: Economic Policy* **7**:3, 209-237. [Abstract] [View PDF article] [PDF with links]

190. J. Scott Holladay, Michael K. Price, Marianne Wanamaker. 2015. The perverse impact of calling for energy conservation. *Journal of Economic Behavior & Organization* **110**, 1-18. [Crossref]

191. Jana Gallus. 2015. Fostering Voluntary Contributions to a Public Good: A Large-Scale Natural Field Experiment at Wikipedia. *SSRN Electronic Journal* . [Crossref]

192. Quinn Keefer, Galib Rustamov. 2015. Limited Attention in Residential Energy Markets: A Regression Discontinuity Approach. *SSRN Electronic Journal* . [Crossref]

193. Dennis Ramondt. 2015. Savings from Smart Thermostats with Energy Displays. *SSRN Electronic Journal* . [Crossref]

194. . Climate change 160-174. [Crossref]

195. Paul J. Ferraro, Juan José Miranda. 2014. The performance of non-experimental designs in the evaluation of environmental programs: A design-replication study using a large-scale randomized experiment as a benchmark. *Journal of Economic Behavior & Organization* **107**, 344-365. [Crossref]

196. Paul J. Ferraro, Merlin M. Hanauer. 2014. Advances in Measuring the Environmental and Social Impacts of Environmental Programs. *Annual Review of Environment and Resources* **39**:1, 495-517. [Crossref]

197. Hunt Allcott, Todd Rogers. 2014. The Short-Run and Long-Run Effects of Behavioral Interventions: Experimental Evidence from Energy Conservation. *American Economic Review* **104**:10, 3003-3037. [Abstract] [View PDF article] [PDF with links]

198. Emma Aisbett, Ralf Steinhauser. 2014. Maintaining the Common Pool: Voluntary Water Conservation in Response to Varying Scarcity. *Environmental and Resource Economics* **59**:2, 167-185. [Crossref]

199. María Bernedo, Paul J. Ferraro, Michael Price. 2014. The Persistent Impacts of Norm-Based Messaging and Their Implications for Water Conservation. *Journal of Consumer Policy* **37**:3, 437-452. [Crossref]

200. Rachel Croson, Nicolas Treich. 2014. Behavioral Environmental Economics: Promises and Challenges. *Environmental and Resource Economics* **58**:3, 335-351. [Crossref]

201. A.L. Sønderlund, J.R. Smith, C. Hutton, Z. Kapelan. 2014. Using Smart Meters for Household Water Consumption Feedback: Knowns and Unknowns. *Procedia Engineering* **89**, 990-997. [Crossref]

202. Todd Rogers, Erin Lynn Frey. 2014. Changing Behavior Beyond the Here and Now. *SSRN Electronic Journal* **34**. . [Crossref]

203. Joachim Schleich, Marian Klobasa, Sebastian Gölz, Marc Brunner. 2013. Effects of feedback on residential electricity demand—Findings from a field trial in Austria. *Energy Policy* **61**, 1097-1106. [Crossref]

204. Paul J. Ferraro, Juan José Miranda. 2013. Heterogeneous treatment effects and mechanisms in information-based environmental policies: Evidence from a large-scale field experiment. *Resource and Energy Economics* **35**:3, 356-379. [Crossref]

205. Lori S. Bennear, Jonathan M. Lee, Laura O. Taylor. 2013. Municipal Rebate Programs for Environmental Retrofits: An Evaluation of Additionality and Cost-Effectiveness. *Journal of Policy Analysis and Management* **32**:2, 350-372. [Crossref]

206. Emma Aisbett, Ralf Steinhauser. 2013. Maintaining the Common Pool: Voluntary Water Conservation in Response to Varying Scarcity. *SSRN Electronic Journal* . [Crossref]

207. Fredrik Carlsson, Olof Johansson-Stenman. 2012. Behavioral Economics and Environmental Policy. *Annual Review of Resource Economics* **4**:1, 75-99. [Crossref]

208. Emma Aisbett, Ralf Steinhauser. 2011. Maintaining the Common Pool: Voluntary Water Conservation in Response to Increasing Scarcity. *SSRN Electronic Journal* . [Crossref]