

THE PERSISTENCE OF MORAL SUASION AND ECONOMIC INCENTIVES: FIELD EXPERIMENTAL EVIDENCE FROM ENERGY DEMAND



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INTRODUCTION

Firms and governments often use moral suasion and economic incentives to influence intrinsic and extrinsic motivations for various activities. Policymakers usually consider these two types of policies to encourage electricity consumers to use less electricity during periods of peak demand.

The first policy intervention is an appeal to intrinsic motivation by using moral suasion for voluntary energy conservation. The second policy instrument is an appeal to extrinsic motivation by introducing dynamic pricing that reflects the higher marginal costs of consumption at peak demand hours. A central question for economists, firms, and regulators designing such policies is whether these

interventions can generate robust and persistent effects by appealing to intrinsic and extrinsic motivations.

In this new paper, Koichiro Ito, Takanori Ida and Makoto Tanaka conducted a randomized field experiment on households near Kyoto, Japan in the summer of 2012 and winter of 2013 to investigate the persistence of these interventions. To invite as broad a set of households as possible, they provided generous participation rewards, which included free installations of an advanced meter and in-home display and a participation reward of the equivalent of \$240. All participating households received the rewards.

GOAL

To determine whether moral suasion or economic incentives can motivate households to conserve electricity during times of peak demand, when the marginal costs of supply are high.

RESEARCH RESULTS

- Moral Suasion Group: had an 8 percent reduction in electricity usage in the short run, but effects diminished over repeated interventions. Total efficiency gains from 15 treatment days were approximately \$24 million.
- Economic Incentive Group: Higher electricity prices during peak times resulted in a 14-17 percent reduction in electricity usage, which persisted over repeated interventions. Moreover, economic incentives cemented conservative energy habits, which persisted after the experiment ended. Total efficiency gains from 15 treatment days were approximately \$77 million.
- Policy Lessons: While both moral suasion and economic incentives can provide efficiency gains, the gains from economic incentives are larger, and persist more over time. The total efficiency gains from both treatments were substantial, with approximately \$100 million in efficiency gains over 15 treatment days.

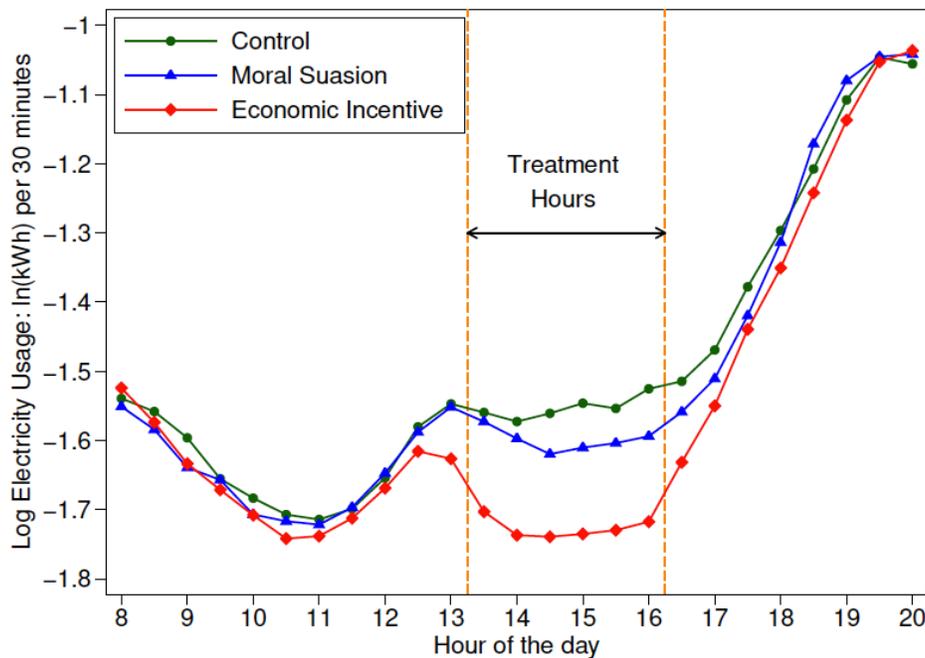


Recruited households were randomly assigned to the control group or one of the treatment groups. While the control group only received these aforementioned rewards and no treatment. The moral suasion treatment group was told that substantial energy conservation would be required for society during “critical peak demand hours” on summer and winter peak demand days. The economic incentive treatment group was informed that they would be charged high electricity prices during the critical peak demand hours on the critical peak days. They received notifications a day ahead and on the same day. On treatment days, the electricity price increased either by 40, 60, and 80 cents/kWh.

Since the baseline prices were 25 cents/kWh, these price increases meant the critical peak price was 65, 85, or 105 cents/kWh. The amount of the critical peak price varied across treatment days. The treatment groups experienced 15 treatment days in the summer and 21 treatment days in the winter. This was done to investigate whether the treatment effects persisted over repeated interventions.

Using high-frequency electricity usage data at the household level, the researchers find that moral suasion induced a usage reduction of 8 percent in the short run; however, the effect diminished quickly when the intervention was repeated (see graph below).

Results: Effects of Moral Suasion and Economic Incentives on Electricity Usage



In contrast, the economic incentive group showed usage reductions of 14 percent for the lowest critical peak price and usage reductions of 17 percent for the highest critical peak price. Moreover, the effect was persistent over repeated interventions. Economic incentives also resulted in habit formation after they withdrew the treatments. The follow-up survey data indicated that most of the persistent changes were likely to have originated from behavioral changes in lifestyle, rather than investments in durable goods.

Finally, the researchers provide the welfare analysis of these two policy interventions. They find that while each policy produces substantial welfare gains, economic incentives provide particularly large gains when they consider persistence. Their results suggest that a lower bound estimate of the welfare gain for the Japanese electricity market is \$77 million per summer for the economic incentive policy and \$24 million for the moral suasion policy.

ABOUT US: THE E2E PROJECT'S MISSION AND STRATEGY

Supported by a generous grant from The Alfred P. Sloan Foundation, The E2e Project is a joint initiative of the Energy Institute at the University of California at Berkeley's Haas School of Business, the Energy Policy Institute at Chicago at the University of Chicago, and the Center for Energy and Environmental Policy Research at the Massachusetts Institute of Technology. E2e unites top researchers in economics, engineering and other fields and uses transparent and state-of-the-art analytical techniques. Our mission is to solve one of the most perplexing energy puzzles of our time—the efficiency gap. Infusing the creation of knowledge with a commitment to non-partisan outreach, E2e aims to create a cheaper and greener future. (<http://e2e.haas.berkeley.edu/>)

