



## Analysis

## Public praise vs. private pay: Effects of rewards on energy conservation in the workplace

Michel J.J. Handgraaf <sup>a,\*</sup>, Margriet A. Van Lidth de Jeude <sup>b,1</sup>, Kirstin C. Appelt <sup>c,1</sup><sup>a</sup> Economics of Consumers and Households (ECH), Social Sciences, Group, Wageningen University, Leeuwenborch (201), Hollandseweg 1, 6706 KN, Wageningen, Netherlands<sup>b</sup> Ecofys, 3526 KL Utrecht, Netherlands<sup>c</sup> Department of Psychology/CRED, Columbia University, 419 Schermerhorn Hall, 1190 Amsterdam Ave, New York, NY 10027, USA

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## ABSTRACT

Any solution to rising levels of CO<sub>2</sub> depends on human behavior. One common approach to changing human behavior is rewarding desired behavior. Because financial incentives often have side effects that diminish efficacy, we predict that social rewards are more effective, because they invoke adherence to descriptive and injunctive social norms. We investigated this by measuring electricity use for 13 weeks at a Dutch firm. Each week, employees were rewarded for conserving energy. They either received monetary rewards (€0–€5) or social rewards (grade points with a descriptive comment). Rewards were either private or public. In both the short and long term, public rewards outperformed private rewards, and social rewards outperformed monetary rewards. This suggests that private monetary rewards, although popular, may be ineffective. Instead, public social rewards may be a more promising approach to stimulating energy conservation. We argue that this approach should be considered more frequently by policy-makers.

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## 1. Introduction

Any solution to rising levels of CO<sub>2</sub> in the atmosphere critically depends on changing human behavior. Although technological solutions (electric cars, energy-efficient appliances, CFL bulbs) can help reduce CO<sub>2</sub>-emissions, behavioral changes are necessary to achieve sufficient reductions (Attari et al., 2010; Dietz et al., 2009; Pacala and Socolow, 2004). Here we focus on changing energy conservation behavior (also termed curtailment behavior, or usage related behavior), and not on the adoption of technology (or efficiency-related change; see Barr et al., 2005; Gardner and Stern, 2008). Studies investigating how to motivate behavior changes in the environmental domain have focused on household energy use (Schultz et al., 2007) and car use (Graham et al., 2011), frequently using monetary rewards to encourage energy conservation (Abrahamse et al., 2005). Indeed, policymakers seem to prefer an economic cost–benefit analysis approach to energy conservation. However, such financial incentives often have side effects that diminish efficacy (Ariely et al., 2009; Bowles, 2008; Fehr and Falk, 2002). Moreover, many of the behaviors under scrutiny here are habitual, and such routine behaviors are not easily changed by using

financial incentives, which require at least some conscious trade-off to be effective (Barr et al., 2005). We discuss these concerns and investigate whether more psychologically-motivated interventions are more effective (Crompton, 2011). In a field-experiment, we tested whether social rewards lead to better results than a strictly economic approach (Allcott and Mullainathan, 2010).

## 1.1. Monetary Incentives

Despite its popularity, there are several problems with the traditional economic approach of providing monetary rewards to incentivize energy conservation. First, recent evidence strongly suggests that monetary rewards can have detrimental effects (Ariely et al., 2009; Bowles, 2008; Fehr and Falk, 2002). Monetary incentives may “crowd out” and replace other motivations (Deci et al., 1999; Frey and Jegen, 2001), such as ethical or moral goals. This is particularly problematic when cost–benefit analyses favor the wrong behavior, as is often the case with energy conservation at the individual level, where small amounts of money are at stake. To illustrate, compare the social request “Please recycle paper” to the monetarily-incentivized request “Please recycle paper, for every pound recycled you will receive a dime”. From an economic perspective, ten cents is better than zero cents, and recycling should be more likely given the second request. However, the monetary reward changes the request from a social/normative request to an economic trade-off, and ten cents may seem insufficient to justify the effort required to recycle. Thus, the monetary incentive may actually decrease the likelihood of recycling. Similarly, offering monetary incentives for energy conservation may change what was initially a moral or

\* Corresponding author at: Economics of Consumers and Households (ECH), Social Sciences, Group, Wageningen University, Leeuwenborch (201), Hollandseweg 1, 6706 KN, Wageningen, Netherlands. Tel.: +31 317 483169; fax: +31 317 484736.

E-mail addresses: [michel.handgraaf@wur.nl](mailto:michel.handgraaf@wur.nl) (M.J.J. Handgraaf),

[M.VanLidthdeJeude@ecofys.com](mailto:M.VanLidthdeJeude@ecofys.com) (M.A. Van Lidth de Jeude),

[kappelt@psych.columbia.edu](mailto:kappelt@psych.columbia.edu) (K.C. Appelt).

<sup>1</sup> All authors are also members of the Center for Research on Environmental Decisions (CRED) at Columbia University.

social issue (i.e., acting for the greater good) into an economic trade-off with small monetary gains. People may be less likely to conserve energy than if no monetary incentive was offered.

Although offering larger monetary incentives may solve some of these problems, they may still lead to, and possibly even exacerbate, the crowding out of intrinsic motivation (Ariely et al., 2009). Of course one could argue that, as long as the incentives are large enough, people will conserve energy. Although this may be true, it represents a costly approach since monitoring behavior and administering rewards involve additional costs. Moreover, there is the question of who will bear these costs. Punishments are another way to encourage conservation. Although punishment may potentially be less costly (even though monitoring and administration costs would be similar), it, too, may crowd out intrinsic motivation (Mulder et al., 2006). Additionally, from a policy standpoint, punishments involve unpopular measures such as taxes or fines.

Another problem with monetary incentives is that they can be interpreted as information about other people's intrinsic motivation. People may reason that, if an incentive is necessary, it must be because others would not cooperate without incentives. Such inferences strengthen the Norm of Self-Interest; the belief that other people are mainly motivated by economic goals (Miller, 1999). People do not want to cooperate if they think that they are the only one cooperating (the 'Sucker Effect'; Kerr, 1983) or if they think that the effect of their cooperation is too small to matter (the 'Drop in Bucket Effect'; Larrick and Soll, 2008).

Yet another problem with economic approaches is that monetary incentives are commonly part of short-term initiatives or programs that eventually run out of funds. Once people have adapted to behaving correctly because of external reinforcement, ending or even merely reducing that reinforcement can spell the end of the desired behavior. A recent example is the purchase of hybrid cars, the sales of which are strongly correlated with oil prices (Beresteanu and Li, 2011). In some cases, the cessation of external reinforcement can even lead to lower than baseline levels of the desired behavior (Mulder et al., 2006).

Moreover, many people do not pay directly for much of the energy they use. In fact, the highest levels of energy use are at the workplace (Kempton et al., 1992), where the employer pays the bill. Even at home, many renters pay a flat rent that includes energy usage. Thus, for many segments of energy consumption, monetary savings are irrelevant and a different approach to encouraging energy conservation is required. In this respect, the situation of energy conservation at work represents a 'delayed social fence', in that the costs for the individual (i.e., changing routine behavior) are immediate and salient, whereas the potential benefits (a decrease in CO<sub>2</sub> emissions) are very distant in both time and relevance (Kollock, 1998; Platt, 1973). This constitutes a situation that is difficult to solve, because the temptation to defect (i.e., not changing behavior) in such a social dilemma situation instead of cooperating (i.e., conserving energy) is very strong.

Finally, the effectiveness of monetary incentives relies strongly on the involvement of conscious reasoning (or System 2 thinking; see Kahneman, 2003) for making tradeoffs between the effort invested and the money earned by doing so. As has been argued many times before, such extensive conscious reasoning is rare (e.g. Busenitz and Barney, 1997), especially when routine behaviors are involved, we argue that changes in energy conservation behavior are to a large extent governed by bounded rationality (or System 1 thinking). For such System 1 decision-making, information about the behavior of peers may provide important guidelines for behavior. We therefore anticipate that social norms, which provide such guidelines, will have a strong influence on energy conservation behavior.

## 1.2. Social Norms

In contrast to the problems of the economic approach, the social norms approach seems to bear promise (Nolan et al., 2008). In many

studies, simply telling people what other people do (providing descriptive social norms) or what is commonly approved or disapproved (providing injunctive social norms) has relatively strong and lasting positive effects on behavior (Abrahamse et al., 2005). In addition to alerting them to what other people do, providing a descriptive social norm tells people what is 'normal'. An unintended side effect of this can be that people who perform better than the norm may decrease their effort (a boomerang effect). However, this can be overcome by adding an injunctive message indicating that the desired behavior is approved (Schultz et al., 2007). Thus, social norms are a promising approach for incentivizing energy conservation.

Performance feedback may be more effective if it is acknowledged by others, or if praise is given when positive goals are reached. Acknowledgement and praise are examples of types of social recognition that may increase intrinsic motivation when provided as information rather than as an attempt to control behavior (Deci et al., 1999). Social recognition communicates an injunctive message; a perception of what is approved or disapproved of within a given culture (Reno et al., 1993). This may also be adopted as a standard from which people do not want to deviate, partly because social recognition may serve as a predictor of desired future rewards (e.g., by fostering a good reputation). As a result, people will engage in behaviors that receive approval and avoid behaviors that lead to disapproval (Bandura, 1997). While social approval may be valued positively because it sometimes generates future benefits, it is believed that most people value social recognition positively (and disapproval negatively) for its own sake (Fehr and Falk, 2002). The provision of social recognition has led to success in behavioral management studies: it led to increased improvements in work performance in the fast-food industry (Peterson and Luthans, 2006) and in an operations division of a credit card company (Stajkovic and Luthans, 2001).

Surprisingly, social recognition has rarely been studied in the domain of environmental behavior. One exception is provided by Schultz et al. (2007), who provided feedback on household energy conservation. Social recognition was given with a positively valenced emoticon (☺) or a negatively valenced emoticon (☹). People received a positive emoticon if they consumed less than the average consumption in their neighborhood and a negative emoticon if they consumed more than the average consumption of the neighborhood. Households that received a negatively valenced emoticon tried to obtain a positively valenced emoticon and therefore decreased their consumptions; households that received a positively valenced emoticon tried to maintain that emoticon by keeping their consumption levels low. Schultz et al. (2007) argued that these emoticons were effective because they improved people's compliance with what was considered appropriate and increased or maintained people's motivation to conserve.

If people are sensitive to how appropriate their behavior is, their sensitivity to appropriate action may be activated even more strongly if their behavior is made known to relevant others. By providing public feedback, relevant others receive information about each other's behavior. This may yield advantages that are not present when rewards are provided in a private context, as explained below.

## 1.3. Social Comparison

Social comparison theory claims that people have a fundamental desire to evaluate their opinions and abilities and that they strive to have stable, accurate appraisals of themselves (Festinger, 1954). According to Festinger, objective non-social criteria for self-evaluations of ability are hard to come by and, as a consequence, people often compare themselves with others to assess their abilities. Public feedback may thus give more meaning to individual scores and a thorough understanding of one's personal score may activate a desire to improve.

A field experiment by Schultz (1999) about the effects of individual versus individual plus group feedback on curbside recycling provides some suggestive evidence for this expectation. Both feedback groups increased recycling. However, the people that also received

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