Journal of Economic Behavior & Organization 108 (2014) 187–197

Contents lists available at ScienceDirect

Journal of Economic Behavior & Organization

journal homepage: www.elsevier.com/locate/jebo

An experimental test of the effect of negative social norms on energy-efficient investments

Mike Yeomans [a,*], David Herberich [b]

[a] University of Chicago Booth School of Business, 5807 South Woodlawn Avenue, Chicago, IL 60637, United States
[b] BeyondCore, 777 Mariner's Island, San Mateo, CA 94404, United States

ARTICLE INFO

Article history:
Received 2 May 2014
Received in revised form
15 September 2014
Accepted 15 September 2014
Available online 5 October 2014

JEL classification:
D12
Q3

Keywords:
Tire pressure
Fuel economy
Energy conservation
Consumer behavior
Social norms
Field experiment

ABSTRACT

Energy efficiency is an important economic and environmental concern, and likewise the correction of current wasteful energy practices. We document widespread "tire pressure neglect" – three-quarters of drivers waste gas driving on underinflated tires. Negative descriptive social norms are one potential cause, but have not been tested in high-neglect environments, where those norms are widespread. This confounds the mechanism: are these norms signals of private value to consumers, or do they imply standards for social judgment from others? We conducted a field experiment at gas stations in Chicago – our intervention included treatments with information about tire pressure neglect, promotions in the form of price reductions from $0.50 to free, a descriptive norm of behavior, and "help" in the form of air pump assistance. The treatments are designed to provide the ability to consider four potential underlying drivers: information, monetary cost, social norms and social pressure. Treatments that only included information were ineffective, despite average fuel savings of $10.51, but small promotions had substantial impacts. When the air pump price was free, the social norm discouraged inflation. However, when the research assistant offered help, inflation rates were buoyed by the social norm. These results highlight the importance of incentives over mere information treatments, and offer a new perspective on how information and monetary levers can influence decision-making in the presence of negative social norms.

1. Introduction

> "Motorists must be alerted to the fact that even small losses in inflation pressure can greatly reduce tire life, fuel economy, safety, and operating performance."
>
> National Research Council (2006).

Energy efficiency is a critical element of policy to address increasing energy prices and the compounding externalities of pollution. Even as the cutting edge of "green" technology advances, many currently available investments in energy efficiency are routinely neglected. This is particularly perplexing to researchers because often the direct personal benefits alone appear to outweigh the costs of conservation, even holding aside social gains (Jaffe and Stavins, 1994; Hausman and Joskow, 1982). For example, government estimates suggest tire pressure under-inflation is common, at roughly 75% of the

* Corresponding author. Tel.: +1 773 679 4853.
E-mail addresses: mk.yeomans@gmail.com (M. Yeomans), dherberich@gmail.com (D. Herberich).

http://dx.doi.org/10.1016/j.jebo.2014.09.010
0167-2681/

domestic personal vehicle fleet (USDOT, 2001). This despite the fact that properly inflated tires can substantially improve fuel efficiency (between 2% and 3%) and also reduce accidents by improving stopping speed and preventing tire blowouts (NHTSA, 2005).

We document widespread "tire pressure neglect" by surveying drivers at gas stations in Chicago. An intervention was designed to address three possible causes of neglect: awareness, cost and social norms. We offered information about tire pressure and gauged subjects' tires, in case they were simply unaware of the concern (Simon, 1955; Gabaix, 2011). We also offered token incentives, and measured their cost against our estimated future savings for drivers. Finally, we were concerned about the perception of widespread neglect as a self-perpetuating social norm (Cialdini and Trost, 1998). Previous field studies have shown that negative descriptive norms discourage good behavior (Cialdini et al., 1990; 2006; Reno et al., 1993), but examine contexts where the negative descriptive norm is artificially induced by experimenters.[1] This confounds the effects of social norms as information (Becker, 1991; Hertwig and Herzog, 2009) and social norms as standards of approval (Benabou and Tirole, 2005; Cialdini, 2003).

We instead test the effects of naturally occurring negative social norms in a randomized between-subjects field experiment. In six of our seven conditions, posters were hung on gas pumps and research assistants offered to gauge tire pressure for free to drivers pumping gas. In three of those six conditions, a negative descriptive social norm was included on the poster. As well, two different incentives were offered – either the pump fee was waived, or the research assistant offered help (or a no-incentive control). While we expected both incentives would increase tire inflation on their own, offering help would emphasize being observed and carry implicit social pressure, compared to waving the fee for the pump. This contrast provides an indirect test of these competing accounts of the effects of social norms – if social approval is being conveyed, then social norms should temper the effect of social pressure.

Analyzing our results, we found that the information intervention alone had almost no effect on tire inflation rates, even though the average driver with one or more low tires (78% of our sample) would have saved more than $10 in gas expenses over the next four months. Two small incentives – waiving the $0.50 air pump fee, or helping with the inflation itself – averaged roughly $30/h in gas savings at the intervention level, and $48/h in the single most effective treatment. In treatments where the descriptive norm was included on the poster, the effects were mixed – when the pump was free, the social norm reduced tire inflation (23.9% vs. 11.6%), but when subjects were offered help by the research assistant, the social norm increased tire inflation (17.3% vs. 32.9%). If the negative descriptive norm primarily worked through the social expectation channel, a decrease in the help treatments would have been observed because the norm would alleviate the social pressure to inflate. However, because we observed the opposite, the norm may primarily be operating through information channel.

This paper is divided into sections as follows: The next section reviews the benefits and costs that are relevant to tire pressure neglect, and applies existing theory to our intervention strategies. Section 3 covers the details of our experimental methods and data sets. Section 4 summarizes the methods and results of our field study. Section 5 discusses the theoretical implications and practical applications.

2. Motivation

There have been economic approaches to the slow adoption of efficient behavior that focus either on market failures, or on atypical or unobserved preferences (see Jaffe and Stavins, 1994). However, we believe that psychological factors also play an important role in obscuring the value of investments in efficiency. A number of recent papers have begun to look at the social impacts on energy conservations (Ferraro and Price, 2013; Herberich et al., 2011; Allcott, 2011). We extend the literature by looking into the potentially confounded impacts of information and pressure.

An initial concern about tire inflation is that most people are simply unaware of the importance of tire inflation, or even the level to which their tires are and should be inflated. That is, it can be difficult to monitor every last detail of car maintenance, and drivers might only focus on a few of the most important things (Simon, 1955; Gabaix, 2011). The effects of inattention are twofold – for one, drivers might not be aware that tire inflation improves fuel efficiency. As well, drivers may not know their own tire pressure level.[2] The inertia of inattention can be powerful (Madrian and Shea, 2001). Our intervention addressed both of these concerns – first, we put posters up on gas pumps alerting drivers to the costs of under inflation (see Appendix A), and we also offered to gauge the tires of any car that pulled up, for free, while gas was being pumped. This is of interest from a policy perspective because recent regulation is focused on impacting behavior through information: recent regulations require automatic tire pressure monitoring systems installed in most new cars in the USA (2007), European Union (2010) and South Korea (2012), with more jurisdictions on the way. Part of our intervention could be thought of as a particularly attention-grabbing, one off, tire pressure monitoring system.

A second channel that may be influencing tire inflation neglect are the upfront costs – money, time and effort – which are small relative to the long-run benefits. However, the immediacy of the upfront costs may discourage inflation

[1] A negative descriptive norm, defined here, is information given to a subject that the desired behavior is uncommon.

[2] Automatic Tire Pressure Monitoring Systems have been mandatory for new cars starting in 2007 but even these only alert drivers once a tire is severely underinflated, and at a risk of blowout (roughly ¼ of all tires, Thiriez and Bondy, 2001).