Title: Encouraging Pro-Environmental Behavior through the Green Labeling Technique

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Extended Abstract (1,000 words max)

As environmental problems, most prominently climate change, gain urgency, increasing sustainable consumption has become an important goal for many organizations (Kauflin 2017; Lawrence Hutter and Capozucca 2010). Much of the pressure to 'go green' comes from individuals; an online survey found that 81% of consumers around the world consider it extremely or very important for companies to implement programs to improve the environment (Nielsen 2018). To this end, in recent years there has been a growing interest, by both private and public organizations, in using insights from human decision-making to design and implement interventions that encourage sustainable consumption (Thaler, Sunstein, and Balz 2013). However, only a limited set of tools have been tested in actual markets in which consumers face trade-offs between green and non-green products(Schwartz, Milfont, and Hilton 2019).

Our research focuses on the green labeling technique, which encourages pro-environmental purchases by associating them with an eco-friendly identity. Previous research has shown that the labeling technique can change people's intention to choose green options in both laboratory and online settings (Eby, Carrico, and Truelove 2019; Cornelissen et al. 2007; Allen 1982), though many of these papers note the need to move beyond intentions to studying actual actions. This is especially true in the domain of sustainable consumption because, even though many people say that they care about the environment (Pew Research Center 2013; BBMG + GlobeScan 2017), and that they intend to consume pro-environmental products, research has repeatedly shown that such intentions often fail to translate into actual behavior (Prothero et al. 2011; De Pelsmacker, Driesen, and Rayp 2005; Carrigan and Attalla 2001; Rokka and Uusitalo 2008; Bonini and Oppenheim 2008). Secondly, we aimed to determine what conditions might make green labeling more or less effective. Given the prominence of price discount promotions, and the possibility that they might interact with green labeling, in the first studies we examine the joint and separate effect of green labeling and price discounts on purchases of eco-friendly products. Research in psychology suggests that people tend to hone in on only one, or a very small number of, explanations for their own and others' behavior (Nisbett and Ross 1980). If shoppers attribute their purchase of a green product to a price promotion, they may be less likely to attribute the same purchase to their own concern for the environment (Schwartz et al.

2015). Thus, it is possible that providing a discount 'crowds out' motivations that would otherwise come into play with green labeling.

Study 1. We conducted a field experiment in a store that sells reusable bags. Consumers (N=2,537) could take away their store purchases in a reusable bag, which they had to buy, or in a free plastic bag. We studied people's bag choices, varying whether the reusable bag had a sign with a green label: "Those who care about the environment take reusable bags." We also randomly varied whether a price discount was offered for the reusable bag (up to 40% off).

We found that the green label increased reusable bag purchases; with no discount, customers were more likely to buy an eco-friendly reusable bag when it was advertised with the green label (27.7%) than when it was not (20.9%), $p = 0.02$. However, this difference was much smaller when a discount was added (29.9% with the label vs. 28.9% without the label), $p = 0.66$.

Study 2. In a lab study, participants (N=611) could buy an energy-efficient light bulb (or CFL) and standard bulbs in an online store. Participants were randomly assigned a 'green label': "this product is for green shoppers" (vs. no green label) and/or a 15%-discount (vs. no discount) next to the CFL's image. Before entering the lab, participants received a $5-coupon to use it to buy one product in the online store. Then they received the product and unspent cash.

We found that more people bought the CFL when there was a green label and no discount, as compared to the control condition that had no label or discount (47.4% vs. 41.0%, $p = 0.09$). Although this difference is marginally statistically significant, the difference was much smaller when there was a discount (43.0% vs. 43.3%, $p = 0.93$). Therefore, across settings, we found a consistent positive effect of the green labeling technique to promote eco-friendly choices, and advertising price promotions may deter its effect even when people actually have to buy a green product.

Study 3. In collaboration with a retailer, we conducted a large email marketing campaign (N=210,043) that promoted energy-efficient home appliances. We examined the effect of an green labeling technique (vs. a generic-control) message on consumers' behavior and whether it varies depending on individuals' characteristics that have shown to correlate with people's pro-environmental values. This study was preregistered.

We found that the green labeling message increased purchases of the advertised product category by 17% (0.03% difference with control (0.21%-0.018%); p=0.08). This effect was driven by customers living in pre-selected wealthier/more educated districts. As a

falsification test, we analyzed other products that were not mentioned in the message, and found no effect of the identity labeling (ps>0.58).

In summary, we show that consistently across studies, the labeling technique is a promising tool to promote eco-friendly behavior and to provide new insights on a nudge tool and its limitations when combined with a standard policy tool.

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