



The effect of incentives on sustainable behavior: evidence from a field experiment



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ABSTRACT

This study investigates how children respond to different treatments aimed to foster sustainable behavior in a productive (firm like) setting. We conduct a field experiment using teams of children (aged 11 or 12) that are participating in an entrepreneurship education program in the last grade of primary school in the Netherlands. Schools participating in this program are randomly assigned to one of three treatments: the first is purely financially oriented, the second promotes sustainable behavior and the third also induces sustainability by (monetary) incentives. Comparing the first two groups we find that solely promoting sustainability does not lead to a change in sustainable behavior. However, once the monetary reward is linked to sustainable outcome measures, we find a significant positive effect on sustainable behavior. In our specific setting, the choice to behave more sustainable comes at the cost of weaker financial performance of the team.

1. Introduction

Pro-social behavior is generally defined as “voluntary contributions to public goods” (Gneezy et al., 2011, p. 199). Examples abound of all kinds of pro-social behavior. At the individual level people engage in donating blood, doing volunteering work, or protecting the environment (Meier, 2007; Iajya et al., 2013; Lacetera et al., 2014). Similarly, at the corporate level many companies include some targets of Corporate Social Responsibility (CSR) into their mission statement or corporate strategy.¹ Examples of CSR include offering sustainable products, donating to charity, or creating employment opportunities for people with a mental or physical disability (Bénabou and Tirole, 2010). In this paper we focus on sustainable, environmentally friendly behavior as a specific type of pro-social (or CSR) behavior. A first aim of this study is to test what the most effective way is to positively influence children's attitudes towards the environment and to increase their sustainable behavior in an educational context. More specifically, we aim to answer the following research question: How do education

about the importance of the environment and explicit incentives affect environmentally friendly behavior of children?

The economics literature in general identifies three potential drivers of pro-social behavior (Bénabou and Tirole, 2006): extrinsic motivation (people may value extrinsic rewards like monetary incentives, gifts, or tax benefits), intrinsic motivation (the desire to do good, like pure altruism or the value of giving per se) and social norms or image concerns (people caring about their self image or how they are perceived by others). Empirical studies not only show that these three motives indeed may positively affect pro-social behavior, they also find that they interact; see the next section for an extensive discussion. For instance, monetary incentives have been found to reduce image motivations (Ariely et al., 2009; Lacetera and Macis, 2010), the explanation being that extrinsic rewards dilute the signaling value of pro-social behavior. Apart from potential trade-offs between different types of motivations underlying pro-social behavior, similar relevant trade-offs in practice result from pro-social behavior not being the only (or main) outcome of interest. This in particular applies for profit firms

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¹ CSR is generally defined as “corporate social or environmental behavior that goes beyond the legal or regulatory requirements of the relevant market(s) and/or economy(s)” (Kitzmueller and Shimshack, 2012, p.53).

Table 1
Motivations of sustainable behavior by treatment.

| | Extrinsic | Intrinsic | Social image |
|-----------------------------|--|---|--|
| <i>Baseline</i> | trade-off financial and social goals: focus on financial goals | positive impact on sustainable behavior | positive impact on sustainable behavior |
| <i>Non-incentivized CSR</i> | trade-off financial and social goals: focus on financial goals | positive impact on sustainable behavior | positive impact on sustainable behavior: stronger than baseline, esp. for non-intrinsic motivation |
| <i>Incentivized CSR</i> | two goals aligned: focus on both goals | potential motivation crowding due to external rewards | potential motivation crowding: image signal diluted |

that have a social (CSR) goal as well; these sometimes add social goals to the traditional financial goals in their performance measurement system (Kitzmueller and Shimshack, 2012). This brings us to the second issue that we aim to address in this study: How do incentives on financial performance influence pro-social behavior, in particular sustainable behavior?

In our experimental setting a trade-off exists between monetary and social goals, and a method has to be found to effectively balance these two (sometimes conflicting) goals. A potential way to induce sustainable behavior and to balance the effort provision between different performance outcomes could be through the use of incentives for both financial and sustainable behavior.² Various studies have looked at the association between incentives and corporate social performance, but the empirical evidence is rather mixed (see Walls et al. (2012) for an overview). The drawback of many empirical studies is that the matching between a CEO and a firm, and between a firm and the remuneration policy, is always endogenous. Hence, it is virtually impossible to establish a causal link.

To solve these methodological difficulties and to answer our research questions we use an experimental design with an environmental focus in a setting in which financial performance also matters. More specifically, we conduct a field experiment within the context of an entrepreneurship education program and study the behavior of teams of children (aged 11 or 12) in response to three different treatments: baseline, non-incentivized CSR and incentivized CSR.³ In all three treatment conditions environmentally friendly options (i.e., sustainable yarn and a sustainability trademark) are available. Except for these environmentally friendly additions, the *baseline* treatment consists of the regular program, and thus serves as our control group. In the two CSR treatments more emphasis is placed on sustainability by explicitly discussing sustainable behavior and the importance of the environment.⁴ In the *non-incentivized CSR* treatment the reward structure is the same as in the baseline treatment and only depends on the financial performance of the team. In the *incentivized CSR* treatment performance is evaluated based on sustainable behavior as well. Given the specific nature of our experimental setting, we thus look at sustainability from a producer's perspective.

The results indicate that differences in sustainable behavior between the teams in the baseline treatment and the teams in the non-incentivized CSR treatment are small and insignificant. This suggests

² Alternatively, sorting into organizations may provide a way out. Besley and Ghatak (2013) model the selection of motivated agents into so-called hybrid organizations. They theoretically show and experimentally confirm that it is possible to use selection, i.e. the hiring of motivated agents, as a tool to create these organizations. However, they find that the supply of motivated agents that are needed to successfully manage such hybrid organizations might not be sufficient.

³ Using the classification defined by Harrison and List (2004), one could argue that this is a framed field experiment rather than a natural field experiment since the education program is quite different from the regular course content in primary schools. That is, the business game is not part of the tasks that the children naturally undertake during regular lessons.

⁴ As stated above, in this paper we study pro-social behavior in terms of sustainable and environmentally friendly behavior. However, we use the term CSR to label our treatments for the sake of abbreviation.

that merely discussing the environment and emphasizing its importance does not cause a (significant) behavioral change. Yet the comparison between the two CSR treatments (i.e., with and without incentives) show that incentives have a significant positive effect on environmentally friendly behavior. Moreover, descriptive evidence suggests that the two CSR treatments also positively influence the children's attitude towards the environment. Since a trade-off is often assumed if financial and social goals are combined within one company, we also estimate the effect of sustainable behavior on financial performance. We find that there are indeed some costs attached to sustainable behavior in terms of lost profits.

This study aims to contribute to the existing literature in several ways. Firstly, to the best of our knowledge we are the first to study attitudes and behavior of children in response to education and explicit incentives aimed at encourage environmentally friendly behavior. Studying sustainable behavior of children could be an interesting starting point to study the development of attitudes towards the environment more in general. A recent strand of literature started by Cunha and Heckman (2007) suggests that teaching certain skills at a young age might produce positive spillover effects in later periods. Our findings on the environmental attitude of the children in the two CSR treatments (measured three to eight weeks after the program) tentatively suggest that encouraging and inducing sustainable behavior in primary schools might lead to positive attitudes towards the environment later in life. Secondly, we use an experimental design to study sustainable behavior in a productive environment in which both sustainable behavior and financial performance matter. Hence, our findings provide some general insights into how to induce sustainable behavior and how to successfully combine financial and social goals. Furthermore, within this productive setting we look at behavior at the team level, instead of at the individual level. Since production decisions are often made by teams, incentives (rather than selection of motivated individuals) might prove to be the more effective way to induce sustainable behavior. Finally, the randomized treatment assignment allows us to estimate a causal effect of incentives on environmentally friendly behavior.

The paper is structured as follows. An overview of the related literature is provided in Section 2. In Section 3 we describe the education program. In Section 4 the design of the field experiment is explained in more detail. Results are shown in Section 5 and in Section 6 we provide a concluding discussion, paying attention to the limitations of our study as well.

2. Related literature

The research questions addressed in this paper are motivated by several recent papers related to individual and corporate pro-social behavior. To get an idea of how our treatments might affect environmentally friendly behavior and the potential size of the treatment effects, we provide a brief overview of some recent laboratory and field experiments that were conducted in this area. First, we look at studies that measure the effect of financial and non-financial incentives on pro-social behavior. Next, we consider studies that look at the interaction between different motivations. Finally, we discuss the potential trade-

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