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Abstract

Experimental studies are a valuable tool to test effective strategies for encouraging sustainable behavior but have not been used much in corporate sustainability research. In this article, we describe the benefits and challenges of the randomized field experimental method for research in corporate sustainability. We draw on the examples of our own research in energy conservation behavior to illustrate some of the hurdles that need to be overcome for the successful implementation of field experiments.

Keywords

field experiment, randomization, energy conservation, corporate sustainability, behavior change, methodology

JEL: C93, D1, D6, D8, D9, Q3, Q4

Introduction

Human behavior is central to research in corporate sustainability. Regulators, shareholders, and customers are important stakeholders who can influence the behavior of managers and employees to move their corporations toward sustainability. Reversely, managers and employees can affect the behavior of stakeholders regarding sustainability through product design, communication, and lobbying. We suggest that randomized field experiments, which are used in many disciplines, but not frequently in management, can be a powerful technique to better understand behavior as it relates to corporate sustainability.

There are two main principles in randomized field experiments (henceforth called field experiments). First, in order to test the effect of a variable, or a treatment, on a given subject, you need a control group where the variable is not present. For example, to test the impact of environmental training on employee productivity, you need to compare the productivity of employees who have participated in environmental training to those who have not. This controls for other factors that might affect productivity that may have changed since the training program was introduced. Second, the treatment is allocated randomly. The researcher decides, by some unbiased procedure, how the treatment will be allocated in the analyzed sample. Field experiments minimize spurious causality and bias and represent a scientifically rigorous design.

The other important feature of "field" experiments is that they are conducted in the field. This is what differentiates them from "laboratory" experiments. While laboratory experiments can provide useful findings, the results from laboratory experiments are subject to questions about generalization to real

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settings (Croson, Anand, & Agarwal, 2007; Levitt & List, 2007). Field experiments allow researchers to make causal inferences and also to deal with real-world situations. This also means that they can test novel strategies piloted in real situations. The results of field experiments can therefore be readily used by firms, nongovernmental organizations, or governments, since they provide information about the magnitude of the effectiveness of different policies or strategies in real situations.

Field experiments have historically been used mostly in medicine (Bhatt, 2010), and subsequently in psychology and other fields of social sciences, including economics (Duflo, Glennerster, & Kremer, 2007; Harrison & List, 2004). However, field experiments have not been used much in management research (Chatterji, Findley, Jensen, Meier, & Nielson, 2016). For example, a search for field experiment in the *Academy of Management Journal*, the flagship journal of the Academy of Management, returned only one article since 2004 (e.g. Martin, Liao, & Campbell, 2013).

We believe that there is great potential for field experiments to advance corporate sustainability research. While the deployment of field experiments can be quite complex, the recent development of information technologies, and of improved metrics for measuring behavioral impact on the environment, can facilitate their implementation. For example, some researchers are using online marketplaces to study employee preferences for sustainability (Bermúdez-Edo, Hurtado-Torres, & Aragón-Correa, 2010; Burbano, in press). In the area of green consumption, we see the rapid development of experimental research on the effect of online environmental messaging campaigns on the demand for green products (Kronrod, Grinstein, & Wathieu, 2012). There is also a growing literature based on field experiments to better understand the drivers of energy conservation behavior. This literature is fueled by the development of smart meter technologies, which allow the observation of individual energy use at high frequency. Indeed, a meta-analysis revealed that 156 field experiments in energy conservation were conducted from 1975 to 2012 (Delmas, Fischlein, & Asensio, 2013).

In this article, we will describe the benefits and challenges of the field experimental method for corporate sustainability. The field experiment methodology is best suited to microanalyses of employee or consumer behavior as they relate to sustainability. The methodology is less suited to testing firm sustainable strategies as they relate to financial performance. First, it might not be feasible for a company to test different strategies simultaneously, and second, the impact of such strategies on financial performance might be minimal in the short term. Thus, experiments are most useful in testing sustainable strategies on individual behavior within the firm or within the firm stakeholders, hence helping researchers better understand the organizational mechanisms that drive corporate sustainability. This is in line with the call for more attention on behavioral questions in corporate sustainability research (Morgeson, Aguinis, Waldman, & Siegel, 2013; Zollo, Cennamo, & Neumann, 2013). We will draw on the examples of our own research in energy conservation behavior (Asensio & Delmas, 2015, 2016; Chen, Delmas, Locke, & Singh, 2017; Delmas & Lessem, 2014) to illustrate some of the hurdles that need to be overcome for the successful implementation of field experiments.

Experiments in Energy Conservation

We conducted three field experiments in energy conservation. We wanted to test how information about electricity usage, in real time, and at the appliance level, could influence energy conservation behavior. Understanding the potential mechanisms to induce energy conservation is important to address climate change, since electricity generation accounts for over 40% of the carbon dioxide emitted by the United States (Energy Information Administration, 2014; Environmental Protection Agency, 2013).

Most households in the United States receive no information of their electricity usage apart from their monthly bills, which do not disaggregate across time periods or sources of usage. Because households are unable to disaggregate their consumption down to particular days or appliances, it is extremely difficult for them to know which changes in behavior would produce noticeable differences in their consumption. One potentially effective informational tool to induce energy conservation behavior is the provision of frequent feedback to consumers regarding their energy usage. Such information allows consumers to better understand when and how they are using electricity, leading to improved energy usage decisions (Fischer, 2008). Being reminded of energy usage periodically may also help trigger conservation activities by making energy usage more salient. In addition, learning about one's own electricity use may increase the sense of relevance of taking action to conserve. However, it is unclear what type of information is effective and in what context.

In each of these experiments, we tested different ways of framing information about electricity consumption. The first two experiments took place at the University of California Los Angeles, one in undergraduate residence halls (Delmas & Lessem, 2014) and the other in a family apartment complex (Asensio & Delmas, 2015, 2016). The third experiment took place in a faculty housing in New Delhi, India (Chen et al., 2017).

The methodology was similar in each of these experiments. Information feedback was implemented using individualized web dashboards and weekly email reports sent to participants over a year (Chen, Delmas, & Kaiser, 2014; Chen, Delmas, Kaiser, & Locke, 2015). The dashboard was designed to inform the residents about various aspects of their energy consumption using different graphical elements and provided them tips on how to reduce their energy consumption. It gave users real-time appliance-level information of their current electricity usage (heating and cooling, lights, plug load, etc.), as well as historical and social usage comparisons and a running average of electricity usage by source. Participants were randomly assigned into one of two treatment messages that were posted on the dashboards. The electricity consumption of subjects in the control group was observed but they did not get access to a dashboard.

Since the original metering system in the buildings did not provide detailed information about electricity usage, we worked with engineers to design an end-to-end system to measure real-time, appliance-level data and provide feedback to households (Chen et al., 2014; Chen et al., 2015).[1]

The buildings provided ideal locations for our studies. First, the rooms in the residence halls, graduate student apartments, and faculty housing are all standardized so that there are no differences in energy efficiency or size in the housing stock. For example, in the residence halls, the experiment took place in three buildings that were built at the same time, and are variations on a common design. Rooms are standardized across the buildings, which are located within a few hundred feet of each other. Each occupant has a bed, desk, and wardrobe. All rooms are equipped with a programmable thermostat, operable window, and florescent overhead light. Second, the participants were renters and were furnished with the same appliances. For example, in the family housing, participants were provided with the same model of fridge, dishwasher, lights, and heating and cooling system.

Experiment 1: Private and Public Information

Experiment 1 was conducted in 66 rooms over an academic year in the residence halls. It tested the effectiveness of public versus private feedback on electricity usage. Individual feedback can be termed *private information* in that it is privately disclosed information about an individual's own energy use or environmental impact. We compared it to *public information*, which is information about the behavioral impact of a specific individual that is publicly disclosed, allowing environmentally friendly behaviors to act as a signal of "green" virtue. In one treatment, participants received private information about their electricity usage, as well as information regarding the average usage in the residence halls. In another treatment, they not only received information about their electricity usage but their usage was also publicly disclosed on a poster visible to all participants. The results of this experiment showed that

1 The system included low-cost sensors, a remote gateway for local processing and data upload, a back-end for data storage, data post-processing, and web hosting. In India, the real-time metering was developed to be included in the building during its construction.

while private information alone was ineffective, public information combined with private information motivated a 20% reduction in electricity consumption achieved through reduced use of heating and cooling. This demonstrated the role of peer pressure and social status as a driver of conservation behavior. It is important to note that participants in the experiment did not pay electricity bills. The benefit was that there was no price effects to confound with our behavioral interventions. This was particularly relevant for reputation motivations, since pecuniary rewards (like saving money on your energy bill) can dilute the green signal given by conservation actions.

Experiments 2 and 3: Health and Money

Experiments 2 and 3 tested the effectiveness of monetary messaging and environmental and health messaging on conservation behavior. Experiment 2 was conducted in 118 apartments in Los Angeles over a year, and Experiment 3 was conducted in 19 apartments in New Delhi over a year. These households paid their electricity bills monthly. In one treatment, households received energy feedback messages describing the cost of their energy consumption in comparison to their most efficient neighbors. In the other treatment, households received feedback about their consumption in the metric of air pollution emissions, rather than as dollar costs to the household. That is, one group received information about how efficiency was serving their self-interest and the other about how efficiency was contributing to the common good of improved health via reduced air pollution. Both experiments yielded similar results. In Experiment 2, the environment information treatment motivated 8% energy savings versus control, and was particularly effective on families with children, who achieved up to 19% energy savings. In Experiment 3, participants in the environment treatment reduced their electricity usage by 18%. In both experiments, there were no significant differences between participants in the monetary treatment and the control group.

Observing Behavior

Field experiments are conducted in real-life conditions and circumvent the accusation directed at laboratory experiments of lacking external validity. However, sometimes researchers use the term “field experiment” to report participants’ responses to online surveys, rather than participant behavior in a real setting. Rather than observing real behavior, these experiments report intended behavior, or stated preferences. As described by Harrison and List (2004), this class of experiment can be described as framed experiments. In framed experiments, subjects are provided field context in either the task, or information set that the subjects use. They provide, as an example, work that elicits valuations for public goods (Bulte, Gerking, List, & de Zeeuw, 2005). In contrast, in a “natural field experiment,” (what we refer to as field experiments in this article), subjects are in the environment where they naturally undertake these tasks (Harrison & List, 2004). Framed experiments can provide very useful insights on intended behavior but might differ from actual behavior in real-world settings. For example, in Experiments 2 and 3, people expressed in a survey that money was their main motivation for saving energy. Yet, in the experiments they did not conserve energy in the treatment where they were informed about potential monetary savings. It is probable that the cost savings treatment made these households realize how inexpensive electricity is. In Experiment 2, the average users would save about $5 per month if they conserved like their most efficient neighbors.

Randomization

Because randomization is a crucial element of field experiments, scholars need to take the necessary steps to ensure it is done appropriately. The random assignment of the intervention is done after subjects have been assessed for eligibility and recruited but before the intervention to be studied begins. Ideally, after randomization, the two (or more) groups of subjects are observed in exactly the same way and the only differences between them is the treatment they receive. If there are specific differences among groups of subjects within an experimental group, scholars can use what is called a 'randomized block design,' where subjects are first divided into homogeneous blocks before they are randomly assigned to a treatment group.

For example, in Experiment 1, randomization into the treatment groups took place at the room level and was undertaken before the experiment began. We limited the public information treatment to only take place over half of the residence hall floors. These “public information eligible” floors were randomly chosen. This was to increase possible peer effects and reduce the experimenter’s effort costs involved in updating posters every week.

Randomization, however, does not guarantee that groups will be equivalent at baseline. In our case, we regressenergy usage during the baseline period on dummies for the treatment groups and each of the randomization stratification, and find that randomization was successful, with no significant differences found between the three groups for heating/cooling, lighting plug load, or overall.

Sample Size

The number of treatment units (subjects or groups of subjects) assigned to control and treatment groups affects an experiment’s statistical power. If the effect of the treatment is small, the number of treatment units in either group may be insufficient for rejecting the null hypothesis in the respective statistical test. Reaching a sufficient sample size might be challenging because of costly subject recruitment, or because some subjects drop out. Power calculations can be computed to determine the effective sample size and the number of treatments (see Duflo et al., 2007, for practical steps involved in power calculations).

Subject participation in behavioral research is usually voluntary. In Experiment 2, we used different avenues to recruit households to participate in the study. This included presence at several community events and administering a recruitment survey. Among the 1,103 households in the building complex, 226 households volunteered to participate and another 88 households in our entry survey chose not to participate. This equals a participation rate of 20%.

The potential bias of self-selected volunteers (vs. the general population) has to be considered in each field experiment that accepts volunteers to participate as representative of a population. The effects of the treatment may be generally well controlled by randomly selecting a control group and a treatment group from among the group of volunteers; however, one should consider carefully if the identified effects of treatment are generalizable to the whole population. In some situations, self-selection bias may be avoided when groups are randomly selected from a population without a requirement of voluntary acceptance (e.g., analyzing the effects of different sustainability messages on offices’ white boards on office performance, or the impact of fair trade messages on consumer purchasing behavior). In any case, make sure that recruitment procedures meet Institutional Review Board ethics requirements.

Field experiments can be costly. In our experiments, our team designed, assembled, and installed the metering equipment. In addition, we needed to budget for additional items required by the university, such as the presence of university electricians during the installation conducted by our team. These resulted in high cost for each installation. So adding participants was costly, with little economies of scale.

Sample size was definitely a concern in Experiments 1 and 3. This limited us to two treatments. Fortunately, we had a very high frequency-dependent variable, since we collected energy consumption information every 30 seconds. This mitigated some of the issues related to the small number of participants.

Mixed approaches that bring different sources of data might help mitigate some of the sample size issue and increase the robustness of the results. For example, in Experiment 3, while energy use was our main dependent variable, we measured many aspects of energy conservation behavior, including access to the energy-monitoring dashboard.

Blinding and Interaction Between Treatments

A plausible concern is that when subjects know they are participating, they might behave differently than if they do not know. This is called the “Hawthorne” effect, a change of behavior from participants as a response to their awareness of being observed.

One way to mitigate this problem is to conduct a blind experiment, where the groups studied, including the control group, are not aware of the group in which they are placed. For example, in marketing, when subjects compare two different brands of washing powder, the samples are presented in the same packaging to avoid bias. Since researchers might also subconsciously influence the subjects, they can take additional precautions through a double-blind experiment, where the researchers do not know in which treatment a subject falls.

However, it is not always possible to “blind” the experiment, since it might be necessary to disclose some information about the experiment to obtain participants consent, or their active participation in the treatment. For example, in our experiments, we told participants that information about their electricity usage would be gathered and that they might receive information about electricity use. This was necessary to obtain the participants’ consent. However, we did not tell them in which information treatment they fell. We did, however, receive a couple of requests from the participants in the control group, who did not receive information about their electricity use, about when they would have access to the energy dashboard. Also, in Experiment 1, our system required us to run some wires on the walls of the participants’ rooms. To minimize awareness of the experiment, we simply put white tape over the wires.

It might be also be difficult to avoid that subjects in different groups interact. This was definitely a worry in our experiments. We feared that participants who did not receive the information about electricity usage might talk to other participants and learn some tips to reduce their electricity. We considered potential spillovers in our randomization and tried to allocate the treatments in different geographical areas of the apartment complex, which had a freeway in the middle, working as a natural communication barrier. We also asked these participants if such interactions happened, but they told us that it did not happen. Fortunately for us, participants in this experiment tended to ignore their neighbors.

Dealing With Experimental Complexity

Good ideas on paper can become quite muddled when you try to implement them. Indeed, the administrative details of conducting a field research experiment can be daunting, and coordination issues might hamper the smooth development of an experiment (Punnett, 1988). In some cases, they require partnership with different organizations, for example, when an intervention can be implemented only within a company. Working with partners can have the advantage of increasing the realism and relevance of the intervention; however, this increases coordination cost. Furthermore, decision makers within these partnering organizations have often little familiarity with the research process (Schrage, 2015). So they need to be educated, especially about the randomization process and the importance of a control group. Withholding treatment might also be problematic. For example, some companies might not be willing or able to treat their consumers or employees differently.

In a field experiment, it might be difficult to control extraneous variables. So, for example, with energy conservation experiments, some participants might experience a power failure. This disrupts the experiment, yet it is beyond the control of the researcher. Technology failure can be another problem, for example, in our case, when the Wi-Fi was down, we could not collect information on electricity consumption. It can therefore be beneficial to have several data collection methods. In Experiment 2, in addition to collecting data via our own metering system, we also collected data based on the meters provided by the electric utility. This allowed us to trouble shoot some technical issues.

It is also important that the experiment does not disrupt the natural setting. For example, in Experiment 2, we installed equipment in the fuse box. We had to pay particular attention to the proper installation of the equipment, so that it did not interfere with the functioning of the electricity provided.

Finally, we have to caution against the temptation to design experiments that are too complex. We (as scholars) are often intrigued about the effects of multiple variables and tempted to include them all in the experiments. However, if the treatments include a collection of simultaneous interventions (e.g., offering environmental information and providing social recognition at the same time), they will require a more complex design and larger sample size in order to identify which factor is making the real difference in the process (if any). Because field experiments are implemented in the vagarious real world, it is preferable to seek clean experiments with simple and well-delimitated treatments.

Impact of the Treatment: Short Term Versus Long Term

It is possible that some of the treatments will have no impact. This might be disappointing, but there might be important findings from these insignificant results. For example, in Experiment 1, the first treatment about private information did not yield significant results. We had put together a sophisticated electricity consumption feedback system, but the information communicated through this system did not have any impact on participant electricity consumption behavior. Luckily the follow-up treatment with public information did work. What we learned was that detailed private information alone did not work, even when participants were compared to others. In other words, technology or information alone was insufficient. We needed to find the right incentives for people to care about the information we presented. However, it was also possible that the private information treatment we chose did not work because our participants did not pay for their electricity. This led us to test our system in Experiment 2, in a context where participants paid their electricity. The results of Experiment 2, about the nonsignificant effect of monetary messages, confirmed the results of Experiment 1. These combined results could inform the design of smart meters and information feedback mechanisms. Real-time, appliance-level energy feedback might not be effective to trigger conservation behavior if the monetary savings are too small to the consumers. Furthermore, framing energy consumption in terms of environmental or health impacts can influence conservation behavior.

It is also possible that the effects of the treatments vary with time. For example, with experiments testing the effectiveness of training, it might be useful to test effectiveness just after the training and a few months later. For instance, in Experiment 2, we found that the responses to our treatments varied over time: We found an immediate conservation effect under both decision frames, but the response to the cost savings framing was short-lived since it faded after seven weeks. It is therefore important to repeat the treatment at different times. A onetime experiment might not yield the same results as a repeated experiment. Also, researchers should ideally test whether the effect of the treatment persists after the treatment is discontinued. This is what we were able to test in Experiment 1. We removed the information treatments and found persistence of the effect after 3 months in the public information group.

It is a good idea to conduct focus groups with the participants after the experiment has ended. These provide very useful insights on the behavioral mechanisms at play during the experiment and help improve the design of the experiment for future related experiments. For example, in Experiment 2, we learned that some participants felt that the reference group chosen to benchmark their consumption (i.e., the 10% most efficient in the complex) was too limited and perceived as difficult to reach. Based on this feedback, we decided, in subsequent experiments, to test the impact of different references groups (Delmas, Vezich, & Goldstein, 2016).

In addition, it is also important to replicate similar field experimental treatments in different contexts to understand robustness and generalizability (Chatterji et al., 2016). We did so in Experiment 3, in which we repeated Experiment 2 in India.

Final Thoughts

In conclusion, social scientists have increasingly turned to the experimental model of the physical sciences as a method to understand human behavior. Field experiments are considered to be the most reliable form of scientific evidence. Furthermore, they have the advantage of testing new strategies rather than looking backward at the success of strategies that have been put in place. This is particularly important in the field of corporate sustainability, where many of the solutions to environmental and social challenges have yet to be developed. Multiple questions might be tested using field experiments. These include customer purchasing behavior in response to sustainable information, employee behavior following environmental training, shareholder reactions to sustainability reporting, or managers' morale in different situations. Research based on field experiment might generate surprising findings to these questions. Methodological restrictions and requirements have to be considered, but they should not be a definitive problem.

References

Asensio, O. I., & Delmas, M. A. (2015). Nonprice incentives and energy conservation. *Proceedings of the National Academy of Sciences*, *112*, E510-E515.

Asensio, O. I., & Delmas, M. A. (2016). The dynamics of behavior change: Evidence from energy conservation. *Journal of Economic Behavior & Organization, 126*, 196-212.

Bermúdez-Edo, M., Hurtado-Torres, N., & Aragón-Correa, J. A. (2010). The importance of trusting beliefs linked to the corporate website for diffusion of recruiting-related online innovations. *Information Technology and Management*, *11*, 177-189.

Bhatt, A. (2010). Evolution of clinical research: A history before and beyond James Lind. *Perspectives in Clinical Research*, *1*(1), 6-10.

Bulte, E., Gerking, S., List, J. A., & de Zeeuw, A. (2005). The effect of varying the causes of environmental problems on stated WTP values: Evidence from a field study. *Journal of Environmental Economics and Management*, *49*, 330-342.

Burbano, V. C. (in press). Social responsibility messages and worker wage requirements: Field experimental evidence from online labor marketplaces. *Organization Science*.

Chatterji, A. K., Findley, M., Jensen, N. M., Meier, S., & Nielson, D. (2016). Field experiments in strategy research. *Strategic Management Journal*, *37*, 116-132.

Chen, V. L., Delmas, M. A., & Kaiser, W. J. (2014). Real-time, appliance-level electricity use feedback system: How to engage users? *Energy and Buildings*, *70*, 455-462.

Chen, V. L., Delmas, M. A., Kaiser, W. J., & Locke, S. L. (2015). What can we learn from high-frequency appliance-level energy metering? Results from a field experiment. *Energy Policy*, *77*, 164-175.

Chen, V. L., Delmas, M., Locke, S., & Singh, A. (2017). Information strategies for energy conservation: A field experiment in India. *Energy Economics.*

Croson, R., Anand, J., & Agarwal, R. (2007). Using experiments in corporate strategy research. *European Management Review*, *4*, 173-181.

Delmas, M. A., Fischlein, M., & Asensio, O. I. (2013). Information strategies and energy conservation behavior: A meta-analysis of experimental studies from 1975 to 2012. *Energy Policy, 61*, 729-739.

Delmas, M. A., & Lessem, N. (2014). Saving power to conserve your reputation? The effectiveness of private versus public information. *Journal of Environmental Economics and Management, 67*, 353-370.

Delmas, M.A., Vezich, S.I & Noah J. Goldstein, Noah J (2016). Better than average or worse than the best? Unpacking peer influences in residential energy use feedback. Working Paper. UCLA Institute of the Environment and Sustainability.

Duflo, E., Glennerster, R., & Kremer, M. (2007). Using randomization in development economics research: A toolkit. *Handbook of Development Economics, 4*, 3895-3962.

Energy Information Administration. (2014). *Electric power monthly*. Retrieved from http://www.eia.gov/electricity/monthly/pdf/epm.pdf

Environmental Protection Agency. (2013). *Inventory of U.S. greenhouse gas emissions and sinks*. Retrieved from https://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2013-Main-Text.pdf

Fischer, C. (2008). Feedback on household electricity consumption: A tool for saving energy? *Energy Efficiency, 1*(1), 79-104.

Harrison, G. W., & List, J. A. (2004). Field experiments. Journal of Economic literature, 42(4), 1009-1055.

Kronrod, A., Grinstein, A., & Wathieu, L. (2012). Go green! Should environmental messages be so assertive? *Journal of Marketing, 76*(1), 95-102.

Levitt, S. D., & List, J. A. (2007). What do laboratory experiments measuring social preferences reveal about the real world? *Journal of Economic Perspectives, 21*, 153-174.

Martin, S. L., Liao, H., & Campbell, E. M. (2013). Directive versus empowering leadership: A field experiment comparing impacts on task proficiency and proactivity. *Academy of Management Journal, 56*, 1372-1395.

Morgeson, F. P., Aguinis, H., Waldman, D. A., & Siegel, D. S. (2013). Extending corporate social responsibility research to the human resource management and organizational behavior domains: A look to the future. *Personnel Psychology, 66*, 805-824.

Punnett, B. J. (1988). Designing field experiments for management research outside North America. *International Studies of Management & Organization, 18*(3), 44-54.

Schrage, M. (2015). Embrace your ignorance. *MIT Sloan Management Review, 56*(2), 95-96.

Zollo, M., Cennamo, C., & Neumann, K. (2013). Beyond what and why understanding organizational evolution towards sustainable enterprise models. *Organization & Environment, 26*, 241-259.

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