Behaviorally designed letters providing information on recycling and waste collection were delivered to 4,800 households and small businesses from the city of Trelew, in the Argentinean Patagonia. This cost-effective and scalable communication intervention doubled waste separation rate to over 30%.

eMBeD
Mind, Behavior, and Development Unit

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The Project

The Argentinean Municipality of Trelew is an excellent example of the dual potential and challenges in moving towards a more circular economy in the developing world. With a system of differentiated curbside collection and a waste separation plant to process the recyclables, the city has all the necessary infrastructure in place. However, only a mere 3% of waste is recovered through recycling, with the remainder rapidly filling up the local landfill.

The role of consumers is central to the waste management system. By separating their waste at the source, they avoid contamination of recyclable material by food waste and other non-recyclables. This simple action preserves the material value and substantially improves the working conditions in the waste separation plant. There, workers currently have to sift through mixed and at times, hazardous waste to extract recyclables, which in turn further hampers the plant's ability to increase recovery rates.

To address these issues, the **Municipality of Trelew, the German Development Institute, and the World Bank** joined forces to apply behavioral insights to improve consumer waste separation.

In a randomized controlled trial, we sent letters and magnetic calendars with different messages to approximately 4,800 recipients in Trelew, 90% corresponding to households and 10% to small businesses. The waste management system in Trelew relies on source separation into two categories: recyclables and residual. Only middle and high-income neighborhoods participated in this intervention as they produce comparatively more waste. In these areas daily collection of waste is destined for the local landfill. Recyclables are collected only once a week and sent to the separation plant. In principle, if only recyclables arrive at the plant on the designated day, then classification is quick and efficient and recovery high. In practice, recyclables are mixed with residual waste, and hardly anything can be recovered.

The project started in November 2018 with a survey to a small sample of households on attitudes and behaviors towards waste management. Based on this information, as well as on insights from the behavioral sciences, and an active debate and validation with local authorities, we designed letters and materials with the goals of i) improving source separation into the two waste categories, recyclables and residuals, and ii) increasing recyclables disposal only on the day they are due. We then randomly allocated 400 street blocks to control and treatment groups and distributed information materials (letters and calendars) in March 2019 to almost 5,000 households and businesses from the selected blocks. Two weeks after the distribution, we collected the waste of 899 randomly selected participants. For each bag from a total of 3.5 tons of garbage collected, we measured its weight, volume, and waste classification. Additionally, we conducted short surveys with 2,700 households focusing on waste separation practices over the weeks following the intervention.

The Results

Recycling behavior improved. Simple, salient, and motivating letters succeeded in incentivizing waste separation and disposal on the correct collection day. Concretely, **the intervention doubled the waste separation from 17% of participants in the control street blocks to 31% in treatment blocks**, two weeks after the distribution of the materials. All messages and instruments worked similarly well, and between 3 to 6 weeks after, over 80% of surveyed participants stated they had kept the material.

The intervention was cost-effective. Our main result was **achieved at a cost of 55 USD cents per participant**, on average. The costs stand against the economic benefits of reduced pressure on the landfill, increased revenue from the sale of recyclables, potential ecological benefits from reduced pollution, and social benefits from improved working conditions in the separation plant.

Informed design was essential. Key to the intervention's success was to **analyze the barriers to households' target behavior thoroughly**. The initial survey revealed that families who already separated found it challenging to remember the day of recyclable collection. It also showed several entry points for motivating non-separating households to take up the practice. This knowledge enabled us to design our interventions in a targeted and effective manner.

Collaboration made the intervention possible and effective. The design and implementation of the project would not have been possible without **close cooperation between the involved institutions and the local government**. This ownership allowed us to firmly embed the intervention in the context, improve the chances of uptake and scaling, and increase capacity within the local government.

The intervention has the potential for sustained results. Behavioral interventions often struggle with the question of the long-term sustainability of effects. Therefore, we will collect data again in September 2019 **to see whether the effects persist** and whether different messages and materials incentivize different behaviors. Furthermore, there is **vast potential for scale** by including and motivating non-separating households and businesses. We thus aim to develop new interventions to reach this population as well.

Recyclables, only on Thursdays
Thursdays, only recyclables

Policy Implications

Understanding the context and carefully assessing barriers through an exhaustive diagnosis is central to the design of cost-effective interventions that aim to modify behaviors. Furthermore, clear, salient, and simple communications from programs and policies should be designed to target these main barriers faced by the intended audience.

Our thorough diagnosis and validation work included reviewing the relevant literature, collecting and analyzing a household survey, and consulting citizens, local authorities, and experts. Only then we were able to select clear target behaviors of separating and disposing of, identify the lack of awareness as a constraint to these behaviors, and design effective communication materials that delivered simplified information on the recycling process and the fundamental role of households in it.

Clear, salient, and simple communications from programs and policies should be designed to target the main barriers faced by the intended audience.

These communications could be complemented with dissemination efforts to further showcase the desired behaviors of consumers in a more salient manner. For example, by targeting limited attention (colored collection trucks, bins, and bags), providing timely feedback (marking or not collecting wrongly disposed bags), or harnessing the social aspect (showing role models and celebrities recycling).

About eMBeD

The Mind, Behavior, and Development Unit (eMBeD), the World Bank's behavioral science team in the Poverty and Equity Global Practice, works closely with project teams, governments, and other partners to diagnose, design, and evaluate behaviorally informed interventions. By collaborating with a worldwide network of scientists and practitioners, the eMBeD team provides answers to important economic and social questions, and contributes to the global effort to eliminate poverty and enhance equity.

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