

# **EVALUATING THE IMPACTS OF RECYCLING/ DIVERSION EDUCATION PROGRAMS -- EFFECTIVE METHODS AND OPTIMIZING EXPENDITURES**

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## **Introduction**

Communities across the nation have implemented a variety of programs and activities to increase recycling at the local level. State agencies have used legislation, education, grants, and other policy instruments to assist and encourage recycling. Recycling professionals at all levels seem to agree that education is an important component of integrated solid waste management and recycling efforts. However, despite the existence of thousands of programs, there is only limited information available on the relative impacts of specific program elements, and virtually no guidance available on the effectiveness of education efforts or the relative value of different outreach methods. This lack of information on impacts makes it difficult for communities to determine the most appropriate and effective budgets for outreach efforts. It also makes it harder to justify budgets for these expenses when questioned by elected officials who are trying to trade off recycling education expenditures against, for instance, increased public safety staff. Community planners need information to assess which are the most effective methods to provide education about programs.

## **Research Questions and Approach**

In response to this need, Skumatz Economic Research Associates, Inc. (SERA) and the Econservation Institute (EI) designed and conducted a project to understand the influence of education – different types, distribution methods, expenditures, and messages – on the level of recycling and diversion in communities / counties. This project was partially funded by a grant from the Iowa Department of Natural Resources (DNR). Through this work, we were attempting to answer several questions: 1) are there satisfactory ways to measure education impacts; 2) is it possible to identify “optimal” expenditures on education, 3) is it important to conduct detailed studies to measure the impacts from individual education programs; and 4) can we provide some feedback on which outreach methods perform well for increasing recycling and diversion. The work consisted of two phases.

- **Literature review.** We conducted literature review and phone interviews with professionals in the resource conservation, recycling/hazardous waste, and advertising fields. We reviewed more than 80 reports and interviewed more than 60 professionals.
- **Data collection and analysis.** We gathered data from communities on their education programs / costs / messages, recycling and diversion programs features, and demographics. We gathered information on more than 140 recycling / diversion



educational campaigns. These campaigns included television, radio, newspaper, billboards, brochures, flyers, and other information distributed via bill stuffing, direct mail, point of purchase, fairs, and a number of other distribution methods.

For this project we collected data on the type of outreach, the outreach distribution method, and we categorized the types of message into 30 categories (e.g., container placement vs. material preparation vs. existence of program, etc.). We believed that the “type” of message would be an important determinant of the effectiveness of the outreach method. We also asked for information on budgets, measures of “hits” and effectiveness, and a variety of other information on the outreach program(s).

To analyze the results, we used both comparisons of “averages” as well as more complex statistical methods. These methods allowed us to examine the separate impacts of each outreach method or message after controlling for other things that differ, including demographics, recycling program differences, and other factors. This is parallel to the technique SERA used in previous work estimating the impacts of recycling and yard waste program features (see *Resource Recycling* September, 1996, September 1999).

## Literature Survey Results

**Energy Conservation and Advertising Results:** Our review of the literature<sup>1</sup> indicates that early programs in energy conservation were designed on the premise that if customers could be made aware of the value of more efficient use of energy, they would change their behavior. However, these studies had difficulty finding an effect on behavior from information, in and of itself. This may be related to the fact that energy consuming behavior is complex and probably habitual, and there is not one single energy using behavior that we are trying to change.<sup>2</sup> For this reason, general information strategies will be difficult to measure because of the multitude of behaviors one is trying to affect. This result is seemingly confirmed by the lack of positive results from studies in the 1970s and 1980s. However, a number of studies have found impacts from these types of programs.

We found that the largest share of the studies worked to attribute a share of the energy savings impacts from combined education plus weatherization (or similar) programs. These studies found impacts from 0-12% from the education portion of the programs. Other studies developed sets of customers within the umbrella of weatherization and education programs to identify impacts from groups that received education-only assistance. These studies found impacts that rivaled the size of the impacts found from their weatherization only groups – 10-12% savings. Education in the form of energy usage feedback was also found to produce 13-15% savings in the studies we reviewed. Research on the impacts from energy centers and other similar

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<sup>1</sup> For a more detailed discussion of the literature we reviewed, see Green and Skumatz, “Evaluating the Impacts of Education / Outreach Programs – Lessons on Impacts, Methods, and Optimal Education”, American Council for an Energy Efficient Environment, 2000 Summer Study Conference Proceedings, Washington, DC.

<sup>2</sup> This point has resonance for recycling and waste reduction, which also represent the culmination of a multitude of behaviors.



educational efforts is also showing impacts.<sup>3</sup> The vast majority of studies in this field used fairly similar methods: measured consumption “before” and “after” the education, in many cases compared to a “control” group or groups that didn’t receive the education. However, the studies usually included very small sample sizes, reducing the reliability of the results. We also conducted an extensive review of the “product” advertising measurement and literature, but these are omitted for space considerations.

**Effects Of Education and Outreach On Recycling Programs:** We were interested in examining whether successful measurement or “orders of magnitude” feedback on the impacts of education or outreach programs might be found in recycling, hazardous waste, or other programs. Education and outreach is considered an important component of recycling programs. While most people think of the refrigerator magnet as the extent of recycling outreach, some communities have taken recycling education to new levels and seen their recovery rates improve steadily. We found seven studies that had examined some aspects of this issue. The summary included studies addressing:

- Overcoming socio-economic factors with outreach
- In-person, door-to-door recycling education
- Increased recovery rates due to recycling education
- Education on household hazardous wastes and
- Studies on in-person education, social-based marketing, and changing behavior based on specific messages.

The detailed results of this review are included in the report.

The review made it clear that multivariate techniques had seldom been applied in the field – likely because of the complexity of the behavioral changes involved, the difficulty of separating the effects from “hard” factors like program components from “soft” factors like outreach methods; and perhaps because the field “hadn’t gotten there yet”. Those studies that had been done had used very small samples, affecting the reliability of the results. SERA had significant experience measuring impacts of energy conservation programs, and had previously had strong success in using statistical methods to measure the effects of recycling and diversion program differences. Earlier, we had found that simplified methods of trying to account for educational differences were unsuccessful.<sup>4</sup> This project enhanced that work, accounting for differences in media, distribution method, expenditure level, and type of message. We “controlled for” demographic and recycling / diversion program differences so we would not confound the results.

### **Results on Outreach and Distribution Methods for Recycling/Diversion Education**

As mentioned, we gathered information on 140 recycling / diversion-related educational campaigns from around the nation. Community size varied from 700 to 200,000 households,

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<sup>3</sup> Peters (Peters 1999) also reports recently finishing work that was able to attributed impacts from a program that had an interactive museum exhibit, a similar type of program, although clearly geared toward a different audience.

<sup>4</sup> These attempts relied mostly on expenditures as the indicator of education.



and we included urban, suburban, and rural communities in our sample. Diversion rates varied from just 9% to almost 65%. Community outreach budgets varied up to \$2.50 per household per year.<sup>5</sup>

We compared the performance of outreach methods for different groups of communities. We found the recycling coordinators to rank their opinions of the effectiveness of different outreach and education methods. We found a number of patterns based on community, information, and distribution method differences, which are highlighted in the report.

Communities reported highest satisfaction with the effectiveness of print media, in particular handbooks, newspapers, and billboards. Lower on the list were electronic media, television, radio, and brochures.

Not surprisingly, larger towns are more likely to go to electronic media, and these towns also show higher budgets per household than those relying on print media. Rural areas have lower diversion rates, but are generally more satisfied with outreach effectiveness overall. Larger communities see economies of scale in outreach; urban communities have low outreach budgets per household and the lowest budget categories shows the highest average household count.

### **Statistical Results on Outreach / Distribution Methods**

We found significant differences in the results for urban vs. rural communities. The analysis allowed us to rank the most effective outreach methods for urban vs. rural communities. The report summarizes the effective types of outreach materials and information dissemination methods. We found that the most effective methods to disseminate information (if you are concerned with increasing recycling) seem to be: newspaper, bill stuffers, billboards, direct mail, and in rural areas, fairs. Television ads do not seem to lead to increased recycling, and in fact, seem to be associated with communities or programs that had lower levels of recycling.

Communities showed highest satisfaction with the effectiveness of printed media, in particular handbooks, newspapers, and billboards. Lower on the list were electronic media (specifically television and radio), as well as brochures. Not surprisingly, we found electronic approaches tended to be used in communities with more households, and the cost of the outreach per household was also higher for electronic approaches. Rural areas tended to have lower diversion rates, and were generally highly satisfied with the effectiveness of their outreach methods (4.1 out of 5). The cost per household for different outreach methods matches generally expected patterns (flyers are cheap, handbooks and electronic approaches more expensive, etc.).<sup>6</sup> Urban areas also seemed to have lower cost per household for outreach, perhaps reflecting economies of scale in outreach.

Clearly, advertising / outreach alone does not determine the level of recycling or diversion. However, the study found significant impacts from these programs. First, we statistically

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<sup>5</sup> Because Iowa DNR contributed funding to this project, more than a proportionate number of the programs surveyed were in Iowa.

<sup>6</sup> The lower cost per household for TV relative to radio reflects differences in the market sizes in which they are used. The absolute costs were higher for TV campaigns.



“controlled for” differences in recycling and diversion program designs (materials collected, rate structures, collection frequency, etc.) and demographics (richer/ poorer communities, etc.). The research found that even after taking into account these programmatic and community differences, program education and distribution methods were important in explaining differences in recycling diversion between communities. The results are included in the report.

We found the education methods that most increased recycling included newspapers and bill stuffers (urban), as well as evidence of increases from brochures, billboards (rural), and direct mail (rural). Television ads do not seem to lead to increased recycling, nor does it seem point-of-purchase, door-to-door (urban), or some other approaches seem effective. The research showed that different methods performed better in urban vs. rural areas, reflecting understandable differences in suitability. For example, billboards in cluttered urban environments may have a harder time breaking messages through than in rural areas.

We find that program planners are tuned in to the most effective measures. They are aware that television does not seem to be the most effective means of distributing the recycling / diversion message. Newspaper and billboards, among others, are reported to have high effectiveness measures from the planners and from the statistical analysis. Many other results are shown in the full report.

## Conclusions

Research quantifying the impacts of education / outreach campaigns on recycling or even broader resource conservation programs is scarce. The work that has been conducted has tended to use simple pre-post methods with control groups –but has been based on very few data points, weakening the results. This project was designed to examine whether different statistical techniques could be used that would provide even more robust and “transferable” results to guide education program design.

The analytical techniques we applied worked very well, allowing us to examine the specific recycling percentages attributable to different education methods. The full report includes additional results, including those examining:

- Information about the impacts of increasing expenditures on education and outreach.
- Information on the impacts of different types or categories of messages, and
- The effects of multi-year outreach – current year outreach could not be expected to fully explain differences between recycling performance.

In short, based on the research issues we were most interested in, the authors came to the following conclusions.

- We believe there are satisfactory ways to measure the impacts of education / outreach programs. We pioneered this application and successfully used multivariate techniques using information from multiple communities and campaigns to separate out the effects of different education methods, distribution methods, and messages.
- It is possible to identify “optimal” expenditures, or at least identify the point at which additional expenditures on specific types of messages or distribution methods have serious downturns in their effectiveness with greater expenditures.



- Although SERA's staff are strong believers in measuring program impacts, we do not believe it is efficient to conduct detailed analyses of the impacts from every education program. Rather, we believe that there are strong similarities in broad concepts of program outreach and education. We believe that the results from evaluations of a number of representative or "template" programs can be applied (with care) across other programs and regions (this is the type of research presented in this report). However, because the quality of the individual educational materials can differ, communities should periodically apply some of the evaluation methods used in the advertising industry to make sure to maximize the quality of the materials and messages distributed. Communities should consider more frequent use of some of the softer advertising techniques including focus group tests of intentions to purchase and test campaigns and educational materials for effectiveness up-front.
- The study provides quantitative results on recycling and diversion impacts from a variety of outreach and distribution methods and types of messages. A sampling of these results was presented in this article. The study confirms some preconceived notions of outreach methods that "work"; however, it allows us to go a "step beyond" and rank and quantity the methods and estimate their specific impacts for different types of communities, and different types of messages.

Additional work related to this study is underway currently, including: cost-effectiveness and impacts of increasing outreach expenditures; effects of different categories of messages; effects of multi-year campaigns; differences by region, demographics, staffing, and other factors.

**About the Authors:** Dr. Skumatz and Mr. Green are economists with the research and consulting firm Skumatz Economic Research Associates, Inc., and conducted this work under contract to The Econservation Institute. SERA assists cities, counties, and state solid waste agencies with policy and analysis in economics, variable rates / PAYT, program efficiency and cost-effectiveness, and integrated planning. For copies of the report, contact the Econservation Institute in its Boulder office at 303/494-1178, by fax at 303/494-1177, or by email at skumatz@serainc.com. EI's web site is [www.econservationinstitute.org](http://www.econservationinstitute.org).

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