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PARTICIPATION IN HOUSEHOLD SOLID WASTE REDUCTION ACTIVITIES: THE NEED FOR PUBLIC EDUCATION*

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ABSTRACT

With landfills quickly reaching their capacities nationwide, public attention has begun to focus on ways of reducing the amount of solid waste produced. In 1985, Somerset County, New Jersey, initiated a pilot recycling program, and made recycling of household wastes mandatory in 1986. Yet even with the power of mandates and the availability of support services such as curbside pick up of recyclables, full participation has not been achieved. A survey was sent to a random sample of Somerset County households to investigate the degree to which various household-level solid waste reduction activities have been adopted by residents. The findings suggest the need for a comprehensive public education program on recycling.

Images of the garbage barge from Islip, New York wandering from port to port in search of a place to dispose of its load flooded the media during the summer of 1987. The sight so captured the public's attention that the barge became a topic of Johnny Carson's monologues. The spectacular attention given to this one event heightened awareness of what is fast becoming a problem nation-wide. It is estimated that more than 50 percent of the cities in the United States will have run out of room in their landfills within the next few years [1].

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Several strategies for addressing the garbage problem have been proposed, including other ways of burying waste, incineration, recycling, and limiting the amount of waste generated in the first place. One method for promoting the latter two strategies is to increase participation *at the household level* in solid waste reduction activities.

Research on techniques for increasing individual participation in a variety of conservation activities points to such influences as attitudes, miscellaneous incentives, and familiarity with the actions involved. In particular, the relationship between energy conservation attitudes and behavior has been widely studied (see [2] for a review of this literature). Although attitude does seem to play a role in the adoption of conservation behaviors, a consistent and predictable link between attitude and behavior has not been established [3-5].

Similarly, much attention has been paid to the use of external rewards or inducements [3, 6-10] to encourage conservation behavior. While incentives such as direct monetary rewards and contests have been found to increase participation in conservation activities, the activities may only endure as long as the financial benefits remain in place [11].

Other factors likely to contribute to conservation behavior have been identified in two studies of energy conservation. In a study of "repetitive" energy conservation behaviors, such as turning down the thermostat at night, Macey and Brown found that adoption rates were influenced by a combination of attitudes, past experience with the behavior and existing social norms [12]. Simmons, Talbot, and Kaplan found that even among energy conservation minded residents, familiar and convenient behaviors were adopted much more frequently than less familiar or more inconvenient ones [13]. For example, energy conservers were more likely to turn down thermostats, turn off unused appliances, and change furnace filters regularly than to clean their refrigerator coils regularly or use a push mower rather than a power one.

In light of the research on energy conservation behavior, it is reasonable to expect that participation rates in various types of solid waste reduction behaviors would reflect the degree to which these behaviors are familiar, convenient, and externally supported. Consequently, by studying the adoption and non-adoption rates of solid waste behaviors a fuller understanding of effective ways of encouraging participation may be gained.

BACKGROUND

New Jersey instituted statewide mandatory recycling in April, 1987. The legislation requires communities to create recycling programs that will reduce their waste stream by at least 25 percent. The first county in New Jersey to institute mandatory recycling, Somerset County, initiated a pilot program in 1985. Mandatory recycling began in the county during September, 1986 (seven months before statewide mandatory recycling became effective). The county program

required each of the twenty-one communities within Somerset County to develop a recycling plan utilizing either curbside pickup or drop-off centers. In addition, each program provides for the recycling of at least three materials such as aluminum cans, glass bottles, newspapers, and magazines.

As mandatory recycling was phased in, household participation rates increased dramatically. An estimated 47 percent of the households were recycling by the end of the first year of the program. But even with the power of legislative mandates, a vigorous public education program, and the implementation of support services such as curbside pick up of recyclables, full participation has not been achieved. What, then, might be done to lead more people to recycle and to take measures to generate less solid waste?

THE STUDY

To learn more about solid waste reduction behavior a survey was developed with the cooperation of the Somerset County Offices of Recycling and Public Information. It was recognized that in any solid waste reduction (and recycling) program people make choices about what to recycle and how often. Recycling and other waste reduction measures are not limited to setting out bundled newspapers and aluminum cans, but also include composting, not buying products that cannot be recycled, substituting reusable products for throwaways (such as diapers), and donating used goods (say to a charity). Accordingly, the questionnaire asked residents to indicate how often they engage in fourteen such activities, rating each (e.g., recycling aluminum cans, reusing scrap paper for notes) on a 5-point scale (with 1 = never participate in the behavior, 5 = they always carry out the behavior). This was part of a larger, eighty-six question survey designed to yield information concerning why residents participate in the recycling program, how they feel about it, and how they get their information about recycling. Of the 1500 surveys sent to a random sample of residents, 567 or approximately 38 percent of the surveys were returned.

RESULTS

The fourteen questionnaire items represented a broad range of potential behaviors (see Table 1). For the purposes of this analysis, the behaviors have been grouped into three categories: participation in recycling, reusing household materials, and "consumer oriented" behavior. The data presented are all based on self-reported behavior. Individuals rated their own degree of participation. Although self-reported data may show a somewhat inflated rate of participation, the relative ranking of participation in the various activities is likely to remain the same.

Table 1. Solid Waste Reduction Behaviors

Behavior	*Mean Score*[a,b]
Recycle newspapers	4.78
Recycle glass bottles	4.61
Recycle aluminum cans	4.44
Donate items to Salvation Army	4.27
Recycle magazines	4.21
Reuse old clothes as rags	3.81
Save leftover materials	3.57
Reuse scrap paper for notes	3.42
Look for recyclable products	3.26
Reuse aluminum foil in kitchen	2.88
Maintain a compost pile	2.82
Avoid non-recyclable products	2.69
Recycle used motor oil	2.65
Use cloth napkins	2.57

[a]1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always.
[b]Those means connected by brackets are not significantly different at the .05 level.

Participation in Recycling

As might be expected, residents tend to recycle most often those items supported by curbside pickup. Of the five most common behaviors (Table 1), four involved direct participation in the Somerset County recycling program (i.e., newspapers, glass, aluminum cans, magazines). Respondents indicated that they recycle newspapers (mean = 4.78) significantly more often than they recycle glass from jars and bottles (mean = 4.61), aluminum cans (mean = 4.44), or magazines (mean = 4.21). Although the residents are recycling all of these items most of the time, greater participation rates are, of course, still possible (Table 2).

Used motor oil (mean = 2.65) is notable in that so few of those answering this question indicate that they recycle their motor oil regularly. As can be seen in Table 2, 55.2 percent of the respondents never or rarely recycle their used motor oil. Unlike the other recyclables that could be considered common, everyday household items, motor oil is a product that many residents may never deal with directly. It may be possible that those who have their oil changed by others do not know what happens to it. As a result, the number of people reporting that their motor oil is recycled may be artificially low.

Table 2. Percent Participating in Solid Waste Behaviors

	Percent Indicating				
Behavior	*Never*	*Rarely*	*Sometimes*	*Often*	*Always*
Recycle newspapers	2.9	.7	2.2	3.9	90.3
Recycle glass	6.1	1.1	2.9	5.2	84.7
Recycle aluminum cans	7.5	4.3	3.4	5.7	79.0
Donate items	1.4	2.5	14.6	30.9	50.5
Recycle magazines	10.3	4.1	8.1	9.7	67.8
Reuse as rags	3.8	5.8	27.1	32.1	31.2
Save materials	5.1	9.7	31.9	29.5	23.7
Reuse scrap paper	9.3	11.8	28.5	28.5	22.0
Look for products	7.2	11.3	43.4	25.3	12.9
Reuse aluminum foil	18.2	16.5	35.4	19.2	10.6
Compost pile	38.5	8.9	13.0	11.3	28.3
Avoid products	16.8	24.8	35.8	17.2	5.4
Recycle motor oil	48.9	6.3	6.3	7.7	30.8
Use cloth napkins	18.8	29.8	32.9	13.4	5.2

Reusing Items

As in most communities, the solid waste reduction program in Somerset County has stressed recycling. Less emphasis has been put on such source reduction measures as reusing household items. By encouraging residents to reuse household items their useful life can be stretched and the need to acquire new products can be reduced. Although the reuse of certain items may be considered a common household practice, overall participation rates are significantly lower than for most recyclables. Reusing old clothes as rags (mean = 3.81), saving leftover materials for later use around the house (mean = 3.57), and reusing scrap paper for notes (mean = 3.42) were mentioned as relatively common activities by the respondents. A significantly smaller proportion of those participating in the survey regularly reuse aluminum foil in the kitchen (mean = 2.88) or use cloth napkins and towels instead of paper (mean = 2.57).

An indirect method of reusing household items is to donate them to the Salvation Army or other community organizations. Eighty-one percent of the respondents state that they often or always donate things no longer needed in their homes. Donating used clothing and household goods seems to be a common practice (mean = 4.27), unlike composting which has been adopted by a much smaller portion of the residents (mean = 2.82). Only 39.6 percent stated that they maintain a compost pile on a regular basis.

Consumer Behavior

Once the peanut butter jar is empty or the newspaper is read, the resident must decide whether or not to recycle it. Yet recycling decisions can be made earlier when products are purchased. The consumer can "precycle" by purchasing items based on their packaging [14]. In this study though, only 38.2 percent of the residents stated that they regularly look for products made of recycled materials in the store (mean = 3.26), and only 22.6 percent say they actually avoid buying products with containers that cannot be recycled (mean = 2.69).

SUMMARY AND IMPLICATIONS

A look at adopted and nonadopted behaviors reveals certain patterns that should be useful in designing future public education programs to encourage greater solid waste reduction behavior. The data suggest that people are recycling significantly more often than they are reusing items and they are recycling those items that are picked up at curbside significantly more often than those that require separate treatment (i.e., used motor oil). Furthermore, although they recycle items brought into the home, as consumers they do not go the extra step to avoid buying products with non-recyclable packaging. For the most part, people are selecting relatively convenient and familiar methods of reducing their solid waste; they have adopted those behaviors that are well accepted and for which external support exists.

In light of the wide public awareness and concern for solid waste problems [15, 16], it may be disturbing to see so few people adopting a broad range of practices. It is reasonable, however, to expect that people are failing to adopt these practices because they lack sufficient knowledge and understanding of how to incorporate them into their everyday lives. As was found in a study of the adoption of energy conservation behaviors [13] people have a tendency to stick to well developed patterns. Thus far, the focus of the public education program has been on recycling and not on the broader issue of solid waste reduction. Since solid waste reduction represents a new set of behavior patterns for most people, the residents may lack the necessary imagery and concrete understandings of the connections among behaviors such as using reusable products and the overall reduction of solid waste. Consequently, residents may resist venturing into behaviors for which they have insufficient models and social support.

A comprehensive public education program is needed to provide both information and models for these less familiar, but effective behaviors. For example, public institutions, schools and service organizations could make a concerted effort to provide positive role models of behavior by printing on both sides of the paper, using recycled paper, and providing reusable cups rather than disposables. To encourage "precycling," labels could be affixed to products on the grocery shelf indicating when recyclable packaging has been used and suggesting alternative non-throw-away products when applicable.

As recycling becomes a practice that is well integrated into daily activities and the pressures on an already overburdened waste disposal system increase, residents will be looking for creative ways of reducing the amount of solid waste they generate. They will need concrete, visible examples of alternative behavior patterns, and a strong public education program can provide these examples.

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