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THE EFFECTS OF THREE PROMPTING METHODS ON RECYCLING PARTICIPATION RATES: A FIELD STUDY

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ABSTRACT

This study compares the effects of three commonly used prompting methods on recycling participation rates. These are: 1) the securing of pledges to recycle through direct, personal contact, 2) the securing of pledges through indirect contact, and 3) the dissemination of educational information alone, with no personal contact or pledge. We applied the three prompting methods to residents of married student housing communities at Louisiana State University during a five-week test program. Securing pledges through direct contact led to significantly higher rates of recycling than either gaining pledges through indirect contact or disseminating only educational information. However, pledging, *per se*, was not shown to result in higher rates of participation. We conclude that the direct-contact prompting raised awareness of recycling, increased peer pressure to recycle, and enhanced delivery of recycling information, and that these effects led to increased participation levels.

INTRODUCTION

More than 4,000 curbside recycling programs have been established in the United States. It is estimated that they divert some 17 percent of the total municipal waste stream [1, p. 42]. In most of these programs, the separation of recyclable materials is done by households and, as a result, program effectiveness depends upon broad-based public participation [2]. Several techniques have been used to try to motivate or "prompt" individuals to participate in recycling programs.

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This study compares the effects of three commonly used prompting methods on recycling participation. These are the securing of pledges to recycle through direct, personal contact, the securing of pledges through indirect contact, and the dissemination of educational information alone, with no personal contact or pledge.

Insight into how well each strategy encourages or prompts participation works is important because recyclers and non-recyclers seem to be remarkably similar in terms of external characteristics such as sex, occupation, and educational level [3]. Thus it is hard to predict *a priori* how participation by alternative target groups will be affected by alternative prompting strategies. Since general education is much cheaper than methods that involve personal contact, it would be very useful to policymakers to know if the more costly and intrusive measures work.

RELATED RESEARCH

Prior research is somewhat ambiguous. Jacobs et al. concluded that a general information-only strategy used to promote recycling was ineffective in changing behavior [4]. However, in a review of 41 environmental programs relating to litter, conservation, and recycling, Ester and Winett argued that if educational material is specific and is delivered creatively and intrusively, the dissemination of information alone can lead to high levels of participation [5].

Wang and Katzev compared the effects of an informational flyer, a group pledge, an individual pledge, and a group reward on participation levels in a university recycling program [6]. Only those who signed individual commitment pledges consistently maintained higher levels of participation.

Katzev and Pardini compared the effects of verbal pledges, written pledges, and information alone on newspaper recycling rates [7]. Both the verbal and written commitment groups were contacted in person by program representatives. Initially both pledge groups recycled more frequently than the information-only group. However, during a follow-up period, the written-commitment group recycled significantly more in terms of total weight and frequency than either the verbal-commitment or the information-only groups.

ANALYTICAL FRAMEWORK

To try to sort out which prompting methods are more likely to encourage participaiton in curbside recycling programs, we attempted to evaluate the following propositions:

1. Direct and personal contact is a more effective method of gaining pledges to participate from residents than indirect, impersonal contact.
2. Residents who sign pledges are more likely to participate in household recycling programs than residents who only receive educational information.

3. Residents who sign pledges as a result of direct and personal contact are more likely to recycle than either those who sign pledges as a result of indirect contact or those who only receive educational information.

We tested these propositions by applying three prompting methods to residents of married student housing communities at Louisiana State University during a five-week test program. All three groups received educational material regarding the benefits and procedures for household recycling. Residents in one group received no further contact or information. Residents in a second group had pledge cards left for them to sign and return. Residents in a third group met face-to-face with researchers who explained the program and asked them to sign pledge cards.

We then measured and compared the recycling frequencies of the three groups to determine whether the prompting methods resulted in significantly different levels of participation.

STUDY PLAN

The subjects in our study were the residents of one-bedroom apartments in the Louisiana State University (LSU) married student housing system at Baton Rouge. At the time of the study, there was no municipal recycling program in effect. We selected three separate apartment buildings—similar in floor plans and residents' demographic characteristics—for inclusion in the study. All of the residents were either graduate students or undergraduate juniors or seniors at LSU. The exact number of people living in each apartment was unknown. We randomly assigned each building to one of the three prompting groups.

To evaluate the first proposition, we applied a Fisher Exact Test to determine whether the direct-contact method led to significantly higher rates of pledging than the indirect-contact method. The Fisher Exact Test is similar to the better known chi-square test but is designed for smaller sample sizes [8].

To test the second proposition, we used one-way analyses of variance (ANOVA's) to determine whether pledgers, as a combined group, actually recycled more than those who did not pledge.

For the third proposition, we again used one-way ANOVA's to determine whether the different prompting methods led to different levels of recycling.

Finally, we applied two-way ANOVA's to determine whether the prompting methods yielded consistent levels of recycling throughout the five-week study.

We began the study in September of 1990 and conducted it over five weeks consisting of an initial three-week intervention period with a two-week follow-up period. On September 3, an informational flyer announcing the recycling project was distributed to all households. The flyer stated that this was a pilot study to help determine the feasibility of recycling in the LSU community. It explained the benefits of recycling, identified the appropriate materials to be recycled, and outlined the separation procedures and pick-up schedule to be followed. The

materials to be recycled were limited to paper (excluding magazines and food containers), unbroken glass, plastic milk jugs and soft drink containers, and aluminum.

We furnished lime green plastic bags with masking tape labels marked "RECYCLE!" to each household. The informational flyer told residents to put their recyclables in the bag and place the bag on their front porch before 6 p.m. on Mondays and Thursdays. We furnished identical plastic bags to replace used ones. Residents were informed that the first pick-up would be on September 10 and the last would be on September 27. They were given the name and telephone number of one of the researchers and encouraged to call if they had any questions. In addition to disseminating the informational flyer and bags for recyclables, we placed posters on the bulletin boards in all three buildings next to the subjects' mailboxes.

We assigned the subjects to one of the following three groups:

1. *Group I (Information Only)*—The informational flyer and first plastic bags were placed between the screen door and the front door of each of the twenty-four households in this group on September 3.
2. *Group II (Information + Pledge)*—The residents of the twenty-four apartments in this group received the first plastic bags and the informational flyer with pledge cards attached. Their flyers also carried a request that they sign the pledge cards, fill in their apartment number, and leave the cards outside their doors to be picked-up. By signing the cards, residents agreed to the following:

   > We are willing to participate in the recycling project. We understand that the recycle bag needs to be placed outside our apartment by 6 p.m. on Mondays and Thursdays for it to be picked-up. We will participate in this project for three weeks.

3. *Group III (Information + Pledge + Direct Control)*—Originally there were twenty-four households in this group. We were unable to contact the residents of four of the households so they could not be included in our analysis. We interviewed the residents of the remaining twenty households. During these interviews, we handed out the informational flyer and recycling bags, asked residents to sign pledge cards, and collected all signed and unsigned cards.

   On September 28, we informed all subjects, via flyer, that the recycling project was to be extended. No ending date was given. They were instructed again as to acceptable recycling materials and pick-up procedures. Subjects in Groups II and III were told that they were no longer bound by their commitments to participate although their continued participation would be appreciated. On October 12, we left flyers for all subjects informing them that the recycling project had been completed.

   We picked up the recyclable materials between six and seven p.m. on Mondays and Thursdays during the five-week program. We placed an

identification card indicating the prompting group, apartment number, and date on each bag upon pick-up. For each group and individual apartment, we then recorded the participation dates and frequencies.

RESULTS

Proposition One — Gaining Pledges to Participate

In Group III, we made personal contact with residents of twenty of the twenty-four apartments in the building. Eighteen of the twenty residents (90%) signed pledge cards agreeing to participate.

In Group II, residents of the twenty-four apartments received the pledge cards with no personal contact from the researchers. Occupants of twelve apartments (50%) signed the cards and placed them outside their front door.

Since we were dealing with a small sample, we applied a Fisher's Exact Test to determine whether the observed difference was statistically significant. A two-tailed test revealed a significant difference between the number of pledges gained by the direct contact method and the indirect contact method ($p = .008$).

Proposition Two — Participation Levels of Pledgers v. Non-Pledgers

We compared the average number of times each week the pledgers and non-pledgers recycled. "Pledgers" consisted of those eighteen subjects who signed the pledge cards in Group III combined with the twelve who signed cards in Group II. (One subject in Group II who did not sign a pledge card but recycled was added to the information-only group for this analysis.)

The pledgers averaged (39 + 72)/30 = 3.7 responses out of ten opportunities. The non-pledgers averaged (77/25) = 3.1 responses. A one-way analysis of variance (ANOVA) test indicated that this difference was insignificant [$F(1,64) = .72, p = .40$]. Therefore, we found no evidence that gaining pledges from potential participants actually led to higher rates of participation.

Proposition Three — Participant Levels of the Three Groups

To evaluate the third proposition, we compared the recycling rates of the three groups at various stages of the five-week study period. This information is summarized in Table 1.

Taking a least squares mean measurement on a per week, per person basis, the average level of recycling activity of each person who was personally contacted—whether or not he or she signed a pledge—was .71 times per week or approximately one recycling effort every ten days. The average level of effort among those for whom the pledge card was left at his or her door—whether or not the subject signed the card—was .37 responses per week or approximately

Table 1. Frequencies of Participation by Prompting Method

Method	*N*	Frequency[a]		
		Intervention	Follow-Up	Total
1. Information Only	24	42 (.58)	33 (.69)	75 (.64)
2. Indirect Contact	24	24 (.36)	17 (.37)	41 (.37)
3. Direct Contact	20	42 (.68)	30 (.75)	72 (.71)

[a]Numbers in parentheses are least square means of participation frequencies, per person, per week.

one recycling episode every nineteen days. The direct-contact group's recycling frequency rate was almost twice as high as the indirect-contact group. The average level of participation within the information-only group was .64 responses per week or approximately one recycling effort every eleven days.

A one-way analysis of variance (ANOVA) was made to compare average overall participation frequencies. The results of the test indicated that the participation rates observed in the direct-contact group were significantly higher than the rates observed in the other two groups [$F(2,65) = 2.55, p = .086$].

If we examine participation rates only during the first three weeks—the intervention period—the subjects in the direct contact group still recycled more than the participants in the other two groups, but by a smaller margin than that observed for the entire five-week period. Early in the program, Group III averaged .68 recycling responses each week while subjects in the information-only group had .58 responses each week. The indirect-contact group averaged only .36 responses each week.

During the program's final two weeks—the follow-up period—all the groups recycled more frequently. Subjects in the indirect-contact group engaged in recycling with a weekly frequency of .37 responses, an increase of .01 responses per week from the intervention period. The subjects in the information-only group showed the largest increase of .11 responses for a weekly rate of .69. The direct-contact group again attained the highest response rate averaging .75 participation responses per week which represents an increase of .09 responses.

We were interested in whether these variations over the two phases of the program indicated that the influences of the three prompting methods varied from the intervention to the follow-up phases. We made a two-way ANOVA to determine whether a significant interaction effect between prompting method and study phase, had influenced participation rates. The test indicated that there was no significant interaction effect ($p = .75$). In other words, the effects of the prompting methods on participation rates did not vary significantly from the

intervention phase to the follow-up phase. All three methods yielded consistent levels of participation throughout the five-week study period.

DISCUSSION OF RESULTS

Our findings suggest that direct, personal contact is a more effective method of gaining pledges than impersonal, indirect contact. There may be several explanations.

First, the meetings with researchers who explained the recycling program may have given the residents a greater awareness of the importance of recycling.

Second, the personal contact may have constituted a type of peer pressure. Since the researchers did not leave the pledge cards with the subjects, but rather asked them to sign at that time, residents were probably somewhat reluctant to refuse. They may have felt that the researchers would have interpreted a refusal as lack of concern for waste disposal problems or more general environmental issues.

Third, presenting the pledge cards and collecting them during the same meeting may have made it more convenient for these residents to pledge to participate. In contrast to subjects in the indirect-contact group, they did not have a chance to misplace the cards and did not have the added responsibility of placing the cards outside their doors to be picked-up.

Our second proposition—that residents who signed pledges should have actually recycled more than those who only received educational information—was not supported. We found that pledgers did not recycle more frequently than non-pledgers. While the subjects in the direct-contact group did recycle more than the other two groups, the relatively poor performance of the indirect-contact subjects compared to the information-only group pulled down the performance of the group of combined pledgers. This is surprising because it contradicts several earlier studies [6, 7, 9, 10].

Our third proposition was supported by our findings that the subjects in the direct-contact group recycled more often than either subjects in the indirect-contact group or the information-only group. We expected to find more recycling in Group III, but anticipated that this would be because the direct contact had generated more pledges than the indirect contact and that pledging would have led to higher levels of recycling. However, our results suggest that the higher levels of participation were the result of direct, personal contact rather than pledging *per se.* The points raised previously about the effectiveness of direct contact in securing pledges also are relevant here. Direct contact may have called additional attention to the program and contributed to a feeling of obligation among the subjects.

The contact also provided an opportunity for clarification of the educational material that the subjects in all three groups received. Although no new information was given to these subjects in Group III, the face-to-face meetings may have enhanced the delivery of the educational information. Prior research has concluded that information is a critical variable in motivating partication in

residential recycling programs [3, 11] and that face-to-face delivery of recycling information may be the most effective dissemination method available [12].

Our analyses indicate that participation levels within each of the three groups remained roughly constant throughout the five-week study period. We were particularly interested in whether there was a significant decline in participation after the first phase of the program for any of the three groups. Although our test period was short, we found no such decline in participation within any of the three groups. This would suggest that all approaches were equally successful in producing "longer-term" recycling, as measured here by consistent levels of participation from the intervention-phase through the follow-up phase. However, a longer period of observation clearly would be necessary to determine whether there are differences in the promptings' effects on participation in recycling programs over time.

SUMMARY

Our findings suggest that while direct contact is an effective method to secure pledges from residents, pledges, in and of themselves, do not lead to higher rates of participation in recycling programs. The increased participation we found in the direct-contact group did not appear to be the result of the subjects signing pledges but, more likely, was due to the contact with the researchers.

The effects of the direct contact may have included a raised level of awareness about recycling, increased peer pressure to recycle, and improved delivery of information.

Based on our findings, taking steps to facilitate direct contact and personal interaction with potential participants in recycling programs would be a better use of program resources than steps to secure pledges *per se.* However, dispatching program representatives to each household to discuss the importance of recycling would be prohibitively expensive. "Block leaders" or volunteers who agree to talk to their neighbors about the benefits of recycling, distribute literature, answer questions, and serve as general role models for recycling might incorporate the direct-contact approach we tested here in a more manageable and economically feasible format.

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