

## **EFFECTS OF VERBAL PROMPTING AND BLOCK CHARACTERISTICS ON PARTICIPATION IN CURBSIDE NEWSPAPER RECYCLING**

**STEVE SPACCARELLI**

**EDWIN ZOLIK**

**LEONARD A. JASON**

*DePaul University, Chicago*

### **ABSTRACT**

The effects of two prompting procedures to promote curbside recycling of newspapers were evaluated. Results indicated no effect on weekly percent participation after handbills alone, and modest increases after handbills plus verbal prompting. The findings also showed there were effects of block characteristics across groups. The presence of one or more recyclers prior to intervention was associated with significantly higher percentages of new participants when examining only blocks which also had block clubs. Also, the existence of a block club was associated with a significantly lower percentage of new participants after intervention, when looking only at blocks where there had been no participants prior to intervention. The implications of these findings are discussed.

Psychologists with an interest in pro-environmental behavior have begun to contribute information on the relative effectiveness of various intervention strategies to promote participation in the recycling of domestic waste. Some studies have suggested that "prompt" information alone results in minimal levels of participation, whereas prompts which also include incentive offers [1], or devices that enhance convenience [2, 3], tend to result in significantly higher participation levels.

Other research has suggested that prompt effectiveness may also vary depending on how the information is presented [3, 4]. For example, in-person

presentation may be more effective than newspaper advertisements or telephone prompts. In two middle income neighborhoods, in Leon County, Florida, Jacobs and Bailey found that households who had access to curbside program information through a newspaper ad and also received individually delivered brochures were more likely than those in a newspaper ad only group to begin recycling over a fifteen-week period [3]. One cannot tell from these data, however, if the newspaper ad reached fewer persons, or if the individual prompts were persuasive. Geller has also reported [4] that in a different experiment, Jacobs and Bailey found that reminder handbills delivered to the door had a small though temporary effect on participation, whereas prompts by phone had none.

In another study of in-person prompting with information only, significant increases in participation were observed [5]. These prompts were unique in that they were implemented by block leaders who had organized themselves in response to the shutdown of curbside service in Boulder, Colorado. Approximately two years later, Nielson and Ellington looked at city wide data and found that weekly participation rates were 26.5 percent on blocks with leaders as compared to 11.5 percent on those without leaders. However, methodological shortcomings (a lack of baseline data prior to the activities of the block leaders and a lack of reliability checks of collected data) make it difficult to draw conclusions from the study.

Methodological problems notwithstanding, the success of the recycling program in Boulder has suggested that "information only" prompts may be very effective under certain conditions. Possible keys to the effectiveness of the block leaders' intervention include:

1. The degree of personal contact associated with their prompts;
2. A high level of commitment or enthusiasm of the block leaders based on their background and/or experience with recycling; and
3. More frequent interaction of neighbors on blocks with leaders.

These hypotheses involve characteristics of prompts (personal contact and prompter emotionality) and a social-ecological variable (block organization) that have not been systematically explored in previous research.

Previous research on social-ecological variables has suggested that differences in population demographics and/or attitudes can affect the results of interventions intended to promote recycling. For example, Weigel found that individual levels of formal education, occupational status, and levels of concern for the environment were each positively correlated with the likelihood of recycling over an eight-week period after in-person prompts by confederates [6]. In another Leon County study, Jacobs and Bailey also found that the effectiveness of door-to-door delivery of brochures and subsequent reminders correlated positively with neighborhood mean housing values (an index of household income).

To date, studies of recycling prompting have paid minimal attention to the possibility of effects of social-ecological variables other than demographic

variables such as income levels. One variable of theoretical importance is community organization. Researchers interested in community participation in general, have begun to look at this issue through the study of block organizations. Initial studies have shown that block organizations are associated with and tend to increase neighbor's social interactions [7]. By increasing the likelihood of conversations between neighbors regarding a given community project, block organizations could function to increase participation directly or enhance the effectiveness of interventions.

A second "ecological" variable often ignored in previous studies of recycling promotion has been the presence or absence of recyclers in a given area prior to intervention. The possible impact of experienced recyclers was noted above with regard to the block leader phenomenon in Boulder. In general, their presence prior to intervention could influence neighbors through modeling (given the visibility of curbside recycling), or through direct testimonial as to positive aspects of participation.

The present study was designed to test the hypothesis that personal contact in the form of verbal exchange enhances the effectiveness of a paper recycling prompt. The study compared the effectiveness of handbills delivered with and without a brief verbal presentation. It was hypothesized that both interventions would increase participation, and that handbills plus verbal prompting would result in greater increases than would handbills alone.

Possible effects of three social-ecological variables were also considered in the present study, including residents' income levels, the presence or absence of block organizations, and the presence or absence of recyclers prior to intervention. The study was conducted in a single community with a significant range of income groups, and the experimental groups were matched in terms of the numbers of blocks with high versus middle- to lower-income housing based on mean real estate values for the blocks. Also, interventions were made on equal numbers of blocks with and without block organizations and with some recyclers or no recyclers prior to intervention. It was hypothesized that across groups, prompts would be more effective on organized blocks and on blocks with some recyclers prior to intervention.

## METHOD

### Subjects/Setting

Residents at 350 households on a total of twenty-four blocks in the South Shore neighborhood of Chicago were involved in the study. South Shore is primarily a residential neighborhood, located on Chicago's lakefront approximately seven miles south of the downtown area. In 1980 the population was 95 percent black, 3.6 percent white, 1.1 percent hispanic, and 0.2 percent Asian. The median income in the neighborhood was approximately \$16,000 (as

of the 1980 census), and 23 percent of the residents had an income below the poverty line. South Shore had 34,162 housing units in 1980, of which 5,121 were single family homes. The area involved in the present study included only single family homes. These homes were on blocks with mean housing values ranging from \$33,000 to \$126,000. Many South Shore residents have organized block clubs concerned with maintaining safety and cleanliness around their homes. Exactly half of the twenty-four blocks in the study had such clubs.

The study was conducted in conjunction with the South Shore Recycling Station, in 1984. At that time the recycling station was operating a successful buy-back program and a relatively new curbside program designed to involve community residents who would not bring in paper recyclables. The curbside program was introduced and initially promoted via written materials and mass media. Leaflets and letters with detailed explanations of how to prepare materials for pick-up were distributed first to a sixteen block area and two months later to an adjacent fifty-four block area. In addition, press releases on the program were given to selected church bulletin editors at the outset and to selected radio stations to announce the expansion. Approximately one year after curbside service was begun in the original area, there was minimal though consistent participation on some blocks and no participation whatsoever on others. The materials collected via the curbside program were insufficient to pay for the costs of the pick-up service, and the program director was interested in developing a strategy to improve participation.

It was hypothesized that the initial leaflets and letters were relatively ineffective because:

1. The type of information included made recycling seem relatively inconvenient; or
2. Written presentation alone was an insufficient motivator and needed to be combined with verbal presentation and some opportunity for discussion.

Thus, in the present study, handbills emphasizing the convenience of curbside recycling of newspapers were distributed in two interventions. In the first intervention they were simply handed to residents, and in the second, they were given in conjunction with verbal prompting.

## **Experimental Design**

Two multiple baseline, across-groups experiments were done. Also, a between-groups design was achieved through random assignment of blocks to the two multiple baseline interventions. A total of twenty-four blocks were randomly assigned to a handbills alone condition (Intervention 1) or a handbills plus verbal prompting condition (Intervention 2). That assignment was also restricted, such that the two groups of twelve blocks were matched in terms of residents' income levels, pre-intervention participation levels, and numbers of

blocks with active block organizations. The twelve blocks in each experiment were also randomly assigned to one of three chronological groups with each group receiving the intervention at subsequent four-week intervals.

Participation data was collected on a weekly basis for thirty-nine weeks. The driver of the curbside route collected that data by checking each address at which paper materials were left in a booklet listing all the addresses in the collection area. The first eighteen weeks of data (pre-baseline) were used to identify blocks with participants. Households were considered participants if they had recorded as recycling at least *twice* during the eighteen weeks of pre-baseline data collection. On the blocks included in the study, there were a total of thirty-three households (sixteen in Intervention 1 and seventeen in Intervention 2) that had participated at least twice during the pre-baseline period.

### Matching Procedure

There were fifty-seven blocks in the curbside area considered for inclusion in the two interventions. These blocks were classified into one of four categories according to the number of households on the block that participated during pre-baseline (some = 1–3 participants; none = 0 participants) and block organization (block club; no block club). Thus, the four categories were:

1. Some pre-baseline participation, block club;
2. No pre-baseline participation, block club;
3. Some pre-baseline participation, no block club; and
4. No pre-baseline participation, no block club.

Six blocks from each of the four categories were randomly chosen to be in the study. The twenty-four blocks were randomly assigned to Intervention 1 (twelve blocks assigned to this condition) and Intervention 2 (twelve blocks assigned to this condition). Using this system, the four categories were equally represented in each intervention. Within each intervention, there were three groups of four blocks, and the four above categories were equally represented in each group. Assignment was also restricted such that one high income (mean housing value, \$80,000–\$126,000), and three low to middle income blocks (mean housing value, \$33,000–\$80,000) were placed in each group. Income was determined by Census data on housing values.

### Reliability Checks

The site manager/driver was told that for reliability purposes his recording of participation would be checked on a periodic basis without his knowledge. This was done by the first author on six randomly selected weeks during the baseline and intervention periods. Addresses of all participants were recorded and compared to the driver's records. A reliability percentage was computed according to the formula of agreements/(agreements + disagreements). The data

recorded was whether or not papers had been left outside for recycling. Only agreements as to participating households were included while false positives and false negatives were included as disagreements. It is possible with this system that a single misidentified address could result in two disagreements, but the system has the advantage of being a conservative, uninflated estimate of reliability.

For the two observers, there were 111 agreements and 36 disagreements, for a reliability of 75.5 percent. Of the disagreements there was no bias in the direction of either false negatives or positives, and no tendency for errors to come in pairs of adjacent addresses.

## Intervention 1

*Procedure* – On the twelve blocks assigned to intervention 1, two handbills were distributed to a total of 175 households (14.6 per block). The first author rang each doorbell and either gave the handbills to the person answering or left them at the door or in the mailbox. Persons answered the door at fifty-one households, and were given the handbills along with the statement, “This is some information on the South Shore Recycling Station’s curbside pickups of old newspapers.” At a few houses in this experiment, persons raised questions or made comments. These were responded to by referring the questioner to the written materials.

*Materials* – The handbills emphasized the ease and importance of curbside recycling of newspaper. One handbill, titled “Some things to remember about your Neighborhood Curbside Collection Service,” outlined for simple steps to recycling newspapers. Under each step it also listed either benefits of newspaper recycling or specific facts about the South Shore Recycling Station. The second handbill was a “facts sheet” titled, “There is more to garbage than meets the eye.” The facts presented on this sheet were chosen to encourage the perception of recycling as a meaningful activity aimed at addressing a serious problem (i.e., waste disposal hazards). Both handbills omitted detailed information on how to prepare all the different recyclable materials that had been included in the Station’s initial leaflet and letters.

*Results* – In each group, post-intervention participation levels tended to resemble closely those during their respective baseline periods. The mean weekly percentages for each chronological group during the baseline and post-intervention periods were as follows: Group 1, 5.8 percent and 6.8 percent; Group 2, 1.9 percent and 4.2 percent; and Group 3, 3.0 percent and 3.2 percent. The totals across groups were 3.2 percent baseline and 5.5 percent post-intervention. Of the households in the experiment not recycling during pre-baseline or baseline, only 2.4 percent recycled at least once in their respective post-intervention periods.

Ringling bells and actually giving handbills to those who were home in this experiment also controlled for the possibility that a significant percentage of handbills left at persons' doors might have never been seen. Where handbills were actually put in persons' hands, only 2 percent ( $N = 51$ ) of the households participated at least once in the post-intervention periods, suggesting that handbills not being seen did not contribute to the weakness of their influence.

## Intervention 2

*Procedure* – On the twelve blocks assigned to this intervention, another 175 households received the same two handbills described above, and were also prompted verbally by the first author to either begin recycling or to continue doing so. Residents at 154 households that had not participated during pre-baseline or baseline, were asked if they were familiar with the program, verbally prompted to consider participating, and given the handbills. The prompt consisted of an explanation of the program with emphasis on the ease of participation, and commentary as to the environmental and economic importance of community-based recycling. Questions or objections were encouraged and discussed. This interaction was typically about one minute in duration, and a maximum of five minutes. A record sheet was used to indicate whether or not anyone in the household was familiar with the program.

The content of the verbal prompt was also modified for the other twenty-one households that had participated during pre-baseline (eight) and baseline (thirteen). Residents at these households were recognized as participants, thanked, and given recycling station buttons. Comments as to the importance of the program were made and continued participation was encouraged. At all households in this experiment, statements as to problems with the program or reasons for not participating, or other exceptional comments were recorded.

*Results* – In this experiment baseline participation levels also hovered between 0 and 10 percent for each of the chronological groups. In general, post-intervention trends were indicative of modest participation increases, with some inconsistency across the three groups. In Groups one and two there were increases after intervention. Mean weekly participation levels for the baseline and post-intervention periods were 4.6 percent versus 10.8 percent, and 6.6 percent versus 9.7 percent for Groups 1 and 2, respectively. In Group 3, however, there was no apparent difference in the baseline and post-intervention trends, though there was an increase in the mean weekly participation level from 3.0 percent baseline to 3.8 percent post-intervention. This increase was almost entirely accounted for by 12 percent participation the first week after intervention. Across groups, the mean weekly participation was 4.3 percent baseline and 9.0 percent post-intervention.

The data also indicated that the modest participation increases after the handbills and verbal prompting intervention were primarily the result of

recycling by new participants, rather than increased recycling by households that had participated during pre-baseline or baseline. Intervention did not increase, but may have helped to maintain the participation of the twenty-one households involved during pre-baseline and/or baseline. The mean percentage of participation by those households was 23 percent of the weeks during baseline and 24 percent of the weeks during the post-intervention periods. Also, of those same twenty-one households, only four failed to participate at least once in the post-intervention periods, whereas in Intervention 1, seven of twelve pre-intervention participants actually failed to participate at least once after receiving the handbills.

Of the 154 households in the experiment not involved during pre-baseline or baseline, 22.1 percent participated at least once during their respective post-intervention periods (duration of time cannot explain these findings because overall there was an equal amount of time from baseline and intervention phases). This total included seventeen new participants (31.5%) in Group 1, eleven (28.2%) in Group 2, and six (9.8%) in Group 3.

Also, record sheet data indicated that persons at twenty-seven of the 154 households not involved during baseline were familiar with the recycling program. A comparison of the response to intervention of the twenty-seven households reporting awareness and the other 127 households indicated that a higher percentage of those aware as compared to those unaware of the program (33.3% versus 19.7%), participated at least once in the post-intervention periods ( $X^2(1) = 2.41$ ).

Other interesting record sheet data indicated that only eight of the 154 persons contacted (4.6%) said they brought their papers to the recycling center themselves (for payment), rather than participating in the curbside program. Also, ten persons reported to the author that they had once recycled but stopped either because a pick-up had been missed or they thought that the program had ceased operation. Some of these persons also expressed uncertainty as to where pick-ups were made (i.e., at the corner only or in front of each house).

## Comparative Analyses

Chi-square analyses were done to evaluate statistically the hypothesis that handbills and verbal prompting (Intervention 2) would have greater effects than handbills alone (Intervention 1). These analyses indicated that the likelihood of there being new participants after intervention was significantly greater in Intervention 2 (22.1%) than in Intervention 1 (2.4%),  $X^2(1) = 29.35$ ,  $p < .001$ . In Figure 1, the cumulative percentages of households participating at least once per week are plotted for each group in both experiments. The figure clearly illustrates that there were persistent increases in the number of new participants in all three Intervention 2 groups, whereas only small initial increases in each Intervention 1 group.



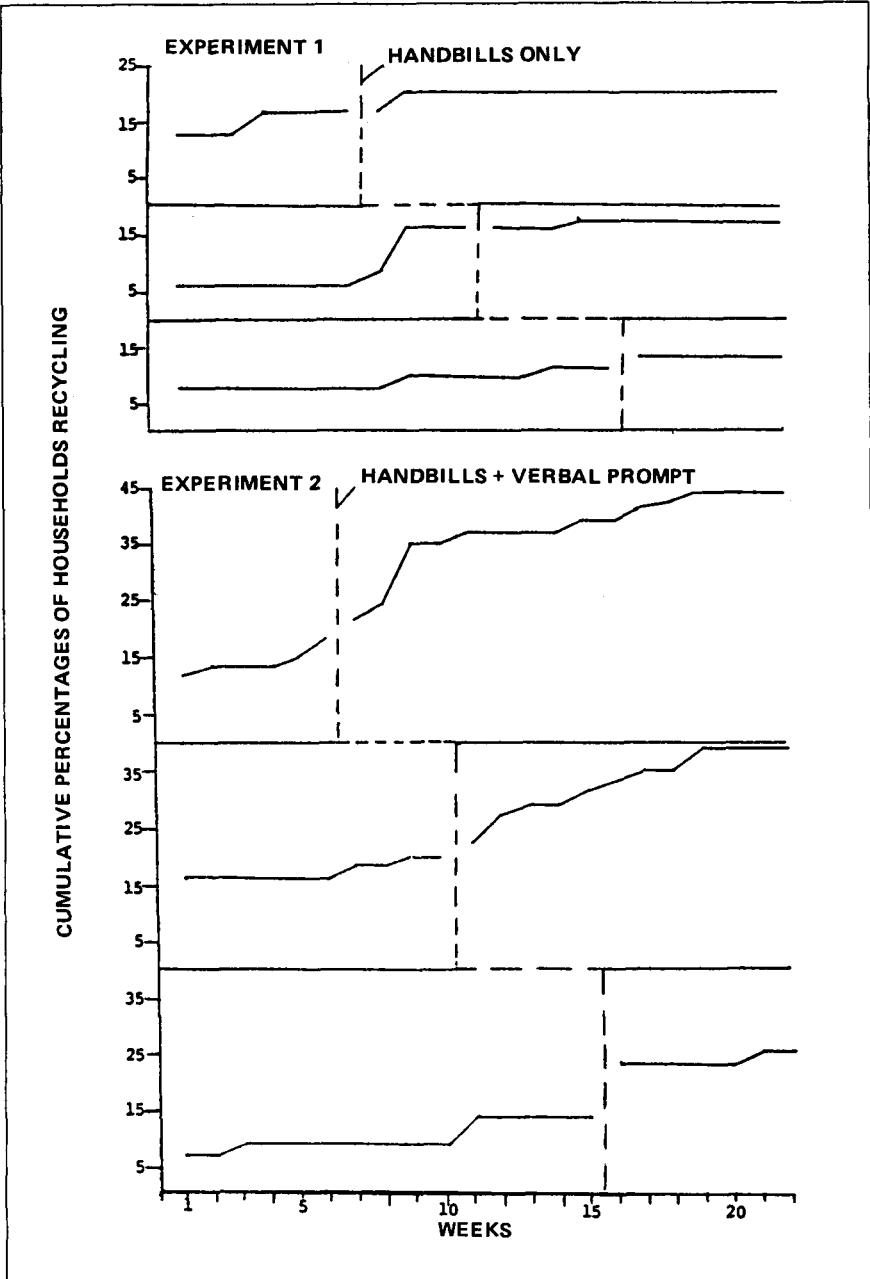


Figure 1. Cumulative percentages of households participating—  
Interventions 1 and 2.

A comparison was also made of the response to the two interventions of pre-baseline and/or baseline participants. Looking only at the subset of households that had participated during pre-baseline and/or baseline, at least one time participation after intervention was again more likely after the handbills plus verbal prompt and buttons intervention (81%,  $n = 21$ ), than the handbills alone intervention (41.7%,  $N = 12$ ) ( $X^2(1) = 10.27, p < .01$ ).

### Effects of Block Characteristics

In both experiments the percentages of new participants after intervention differed for blocks with and without participants during pre-baseline. After the handbills alone intervention (Intervention 1), the percentage of new participants was 0.9 percent for blocks with no pre-baseline participants and 5 percent for blocks with some pre-baseline participants ( $X^2(1) = 2.66$ ). After the handbills plus verbal prompting intervention (Intervention 2), the percentage of new participants was 11.5 percent for blocks with no pre-baseline participants and 23.3 percent for blocks with some pre-baseline participants ( $X^2(1) = 3.79, p < .10$ ). Thus, the verbal prompt plus handbills intervention was more effective on blocks with persons who recycled during pre-baseline and there was a similar, though nonsignificant trend for the handbills alone intervention.

Looking at data pooled across the two experiments, the effect of pre-baseline participation varied somewhat with the presence or absence of a block club. The percentage of new participants was 15.9 percent on blocks with clubs and some pre-baseline participants, and only 2.9 percent on blocks with clubs but no pre-baseline participants ( $X^2(1) = 9.26, p < .01$ ). Thus, on blocks with clubs, the presence of neighbors who recycled during the pre-baseline period was associated with significantly better response to the two interventions. On blocks without clubs and some pre-baseline participants the percentage of new participants after intervention was 13.3 percent, whereas this percentage on blocks without clubs and without pre-baseline participants was 8.8 percent ( $X^2(1) = 0.78$ ).

Still looking across the two experiments, the percentage of new participants after intervention was significantly lower on blocks with block clubs and without pre-baseline participants (2.9%), than on those without block clubs and also without pre-baseline participants (8.8%) ( $X^2(1) = 3.05, p < .10$ ). This finding was unexpected and suggest that on blocks without pre-baseline participants, block clubs actually detracted from the intervention effectiveness.

Finally, responsiveness to intervention in this study was consistent across income groups. Pooling data from Intervention 1 and 2, and looking across the other block variables, 9.9 percent of households on relatively low income blocks, and 7.1 percent on the higher income blocks became involved post-intervention ( $X^2(1) = .50$ ).

## DISCUSSION

The results clearly show that more new participation resulted from the handbills plus verbal prompting intervention than from the handbills alone. The number of at least one time participants increased to approximately 30 percent after the handbills plus verbal prompting intervention. It is possible that the personal contact involved in that intervention was influential because it added credibility or weight to the information in the handbills. This is unlikely, however, given the complete lack of effect of the handbills alone. As an alternative explanation, the prompter's effort to communicate may have expressed commitment and concern that was a motivating factor quite independent of the information being conveyed. The personal contact may have motivated recycling itself, or other intermediate action such as talking about recycling with others in the household or immediate community.

Each of the effects of block variables obtained here seem to support the notion that prompting may have resulted in conversation with others on one's block. The occurrence of conversations between prompted residents and experienced recyclers seems the most parsimonious explanation of the enhanced intervention effectiveness obtained on blocks with some pre-baseline participants. Also, the variable impact of a block club given the presence or absence of pre-baseline participants can be understood in terms of a greater likelihood of conversations occurring between neighbors on organized blocks. If one assumes that persons uninvolved with recycling are more likely to dismiss the behavior and those involved are more likely to endorse it, the greater communication associated with organized blocks would be expected to have variable effects in terms of intervention outcome. Thus, conversations between block club members enhanced the response to intervention if one or more block residents were experienced recyclers, whereas those conversations probably had the opposite effect in the absence of experienced recyclers. A process of norm reinforcement or activation such as this has been discussed by Nielson and Ellington in considering possible mechanisms of innovation diffusion at work in situations such as the re-emergence of recycling in Boulder [5].

The above interpretations of the present data assume that persons confronted by social pressure tend to determine whether or not the behavior being promoted is approved of or endorsed by an appropriate group of peers, and that for a visible behavior such as curbside recycling, one's neighbors would be a very appropriate peer group to examine. They also assume a rather simple process of social influence, in which attention is called to a behavior, and significant others' approval of the behavior (either direct or indirect) results in adoption.

In the groups that responded best to the handbills and verbal prompting intervention, weekly participation was only raised to the 10 percent level. While this raise was statistically significant, it was far short of the 50 percent that has been achieved in other successful programs. This rather limited effectiveness may

have been indicative of negative attitudes toward recycling or the specific program being promoted. Some anecdotal evidence of negative perceptions of the specific program was obtained in Intervention 2. Several residents in that experiment reported that they had once recycled but stopped because a pick-up had been missed or because they thought the program had ceased operation. The form of influence described above may be insufficient to change the behavior of persons who have such negative feelings or opinions.

Another possible reason for the limited success obtained in the present study was that the interventions involved a single contact. Repeated reminders may be necessary to maintain or raise the frequency of participation of those who have tried recycling or have some interest in doing so. Data obtained here as to the response of prior participants indirectly suggested that repeated intervention may be needed, in that personally thanking and offering buttons to recyclers tended to prevent them from decreasing their frequency of participation.

It is also possible that regardless of any interventions, a significant number of newspaper recyclers will not put materials out on a weekly basis. Some may choose to store the papers, others may acquire them sporadically or not at all. In an experiment in which Jacobs and Bailey obtained 50 percent weekly participation after intervention [3], over 90 percent of the residents had participated at least once by the end of the data collection period. It may be necessary to involve such a high percentage of households at one time or another, in order to achieve weekly participation of 50 percent or greater. Though the handbills verbal prompting intervention evaluated here was somewhat successful in regard to new participants, it only increased the pool of at least one time participants to 30 percent.

Information from the present study suggests that the 70 percent who resisted curbside participation completely probably did not do so as a result of either a preference for buy-back recycling or a lack of awareness of the curbside option. On the first point, very few residents in Intervention 2 indicated that they brought their papers to a recycling center, in spite of the small cash payments made by most drop-off centers including the South Shore Recycling Station. As to lack of awareness, Intervention 2 data indicated that households that reported familiarity with the program were actually more likely than those unfamiliar with it, to recycle at least once during the assessment period.

In conclusion, two main points can be drawn from the present study. First, the results suggest that personal contact between program representatives and potential recyclers is valuable. Such contact can be instrumental in influencing persons of various income levels to begin to recycle. Also, it can provide important information for planning future interventions. Programs may learn of resident confusion as to how to participate and of negative perceptions of service.

Second, the findings suggest that interventions can be designed which activate or work in conjunction with naturally occurring processes of social influence. Targeting interventions on areas where participation and the blocks

are organized, may take best advantage of potential recyclers tendencies to emulate others and/or conform to neighborhood norms. Future research evaluating efforts to promote pro-environmental behaviors such as recycling should continue to consider the effects of different levels of contact involved in prompts, and of social-ecological variables such as pre-intervention participation and block organization.

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Direct reprint requests to:

Leonard A. Jason  
 Department of Psychology  
 DePaul University  
 Chicago, IL 60614