

AN EXPERIMENTAL ANALYSIS OF ANTI-LITTER PROCEDURES¹

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This study evaluates the differential effectiveness of six different anti-litter procedures in two neighborhood theaters. The procedures used to encourage individuals in attendance to pick up litter and deposit it properly included: providing litterbags, providing litterbags with instructions to use them, providing extra trash cans, showing a special anti-litter film before the feature film, and providing incentives for the appropriate deposit of litter. In both theaters, the incentive procedures resulted in the removal of over 90% of all litter by the children in attendance, a figure far above that achieved by the other procedures investigated.

Traditional approaches to the control of littering in public places usually take one of three forms. One, laws are established imposing sanctions on the behavior. Unfortunately, the difficulty of monitoring littering behavior or even tracing the litter back to its source make successful enforcement of such laws improbable. Two, attempts are made to modify individuals' "attitudes" through advertising campaigns that deplore the ecological and esthetic costs of littering, or extol the virtues of picking up litter. The growing litter problem suggests the ineffectiveness of this approach. Three, attempts are made through survey research to discover the "personality" and social characteristics of litterbugs. The difficulty here is that such knowledge does not immediately provide methods for the control of littering.

The objective of this study was to determine if anti-litter behavior could be developed. The

question was, what procedures would increase the frequency of picking up litter?

METHOD

Subjects and Setting

The primary subjects were children who attended the Saturday children's matinees in two neighborhood theaters on 14 different occasions. The seating capacity of Theater 1 is 1500, but for the children's matinees the average attendance was only 160. The seating capacity of Theater 2 is 800, and average attendance was 220.

Procedure

At each performance the audience size was determined from the ticket sales. The usherettes were asked to put all of the litter they collected into a special container, which was not used by anyone else. When the matinee was over, the litter from the trash cans was weighed, and then the floor was swept and that litter weighed. The litter collected from the usherettes' container was weighed along with the litter swept from the floor. The dependent variable was the per cent of the total litter in the theater deposited in the trash cans.

The basic design utilized was the ABA reversibility method (Sidman 1960; Burgess and Bushell 1969). The experimental conditions imposed in Theater 1 were baseline, litterbags, baseline, litterbags plus instructions

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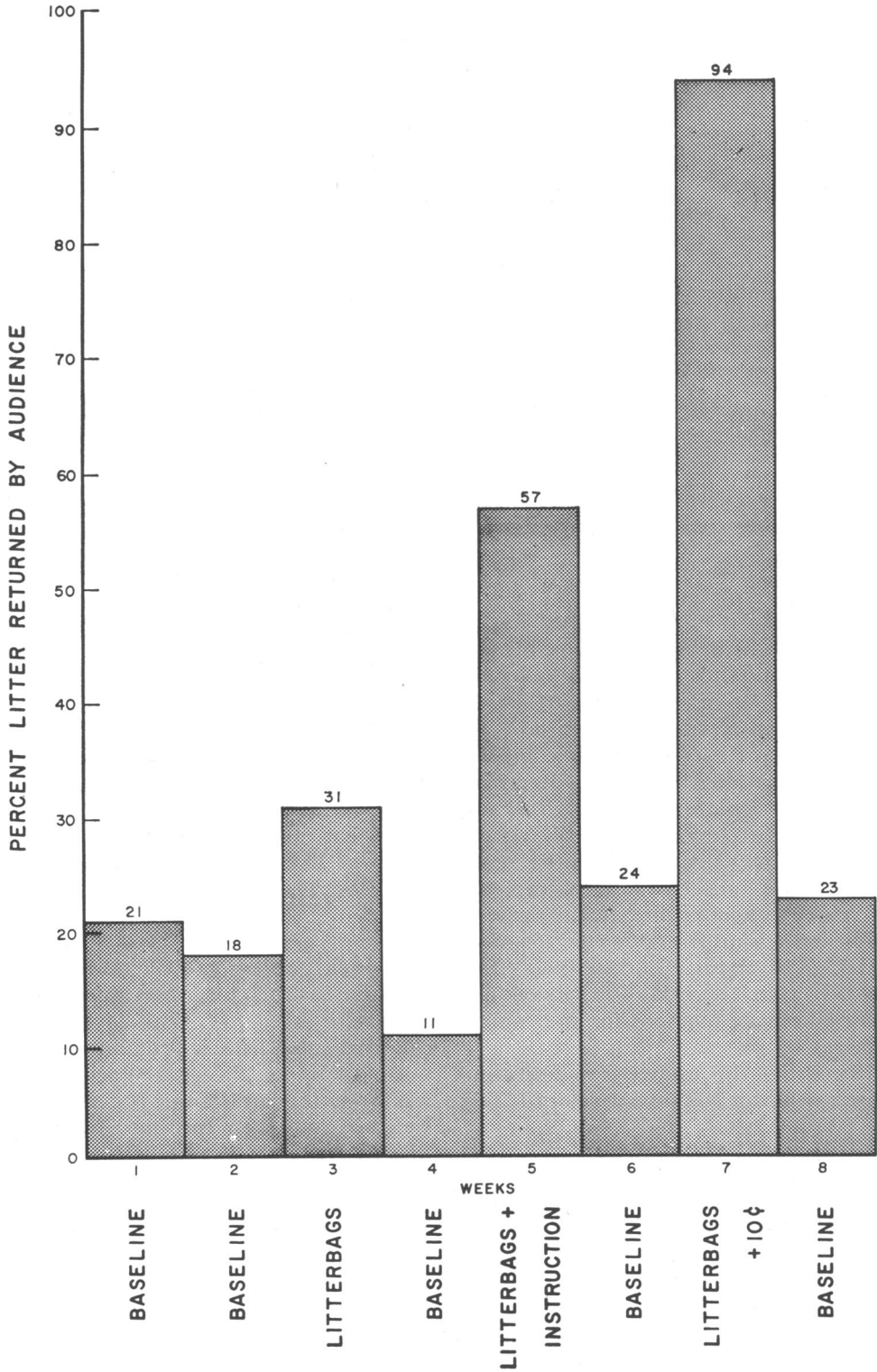


Fig. 1. Per cent of total litter in Theater 1 returned by the audience during successive experimental conditions.

to use them, baseline, litterbags plus 10¢, baseline. The sequence of procedures in Theater 2 was baseline, extra trash cans, litter film, litterbags plus tickets to a movie, baseline.

Baseline. This condition established the amount of litter normally found in the theaters. No special anti-litter procedures were in effect during baseline conditions.

Extra trash cans. This condition was the same as baseline except that the number of trash cans normally present in the theater was doubled. These additional cans were placed more conspicuously than the usual ones.

Litter film. This condition was the same as baseline except that before the regular show an anti-litter film was shown. The film, titled "Litterbug", is a Walt Disney children's cartoon.

Litterbags. A litterbag was given to each person as he entered the theater. As he was handed his litterbag he was told: "This is for you to use while you are in the theater."

Litterbags plus instructions. As in the previous condition, all persons entering the theater were given litterbags. In addition, an announcement was made at intermission in which the audience was instructed to: "Put your trash into the litterbags and put the bag into one of the trash cans in the lobby before leaving the theater."

Litterbags plus 10¢. This condition was exactly the same as the Litterbags condition except that each person was additionally told: "If you bring a bag of litter to the lobby before leaving the theater, you will receive one dime in exchange." Children bringing empty litterbags were told to collect some litter from the floor before they would be given a dime.

Litterbags plus tickets. A litterbag was given to each person entering the theater and, before the movie began and at intermission, it was announced to the audience that: "Each person returning a bag of litter will be given a free ticket to a special children's movie." This special movie was shown the following Wednesday afternoon.

RESULTS

The major results of this study are presented in Fig. 1 and 2. Figure 1 indicates that only 19% of the total litter in Theater 1 was properly disposed of by the audience over the five baseline conditions. Litterbags alone increased

that to 31% and litterbags plus instructions resulted in the return of 57% of the litter. However, by far the largest effect in Theater 1 occurred when 10¢ was paid for each bag of litter turned in. There were 137 individuals in the audience and 95 of them (65%) received such payment. In this condition, 94% of the litter present in the theater was handed in by members of the audience.

In Theater 2, an average of 16% of the litter was placed in trash cans over the three baseline conditions. Doubling the number of trash cans available in the theater produced no effect, and the Disney anti-littering film increased the amount of litter returned only 5% above baseline. In contrast, when members of the audience were given free tickets to a movie upon depositing their litter, 95% of the total litter in the theater was placed in the receptacles. On this day there were 485 people in the audience and 285 of them (59%) received free tickets.

On the following Wednesday, 143 of them attended the special movie. Fifteen of the 143 children attending this special show had not received tickets but were admitted upon the insistence of several irate parents who apparently misunderstood the theater manager's instructions. All of these children came with friends who had received the special ticket. At the completion of this movie, over twice as much litter was turned in by the audience than that obtained during the standard baseline conditions.

DISCUSSION

Several of the procedures employed in this study have a long history of use. For example, some business firms offer free litterbags to their customers, assuming that they will be used. Likewise, the National Park Service and Forest Service commonly offer litterbags and literature to tourists in their respective areas. However, the high level of littering in streets, highways, and in parks and public places suggests that litterbags, if used at all, are employed by only a small percentage of the people. Data from the present study support such a contention. Another common argument is that people would not litter if ample trash receptacles were available. Indeed, a national public opinion survey study of littering concluded that the absence of trash receptacles

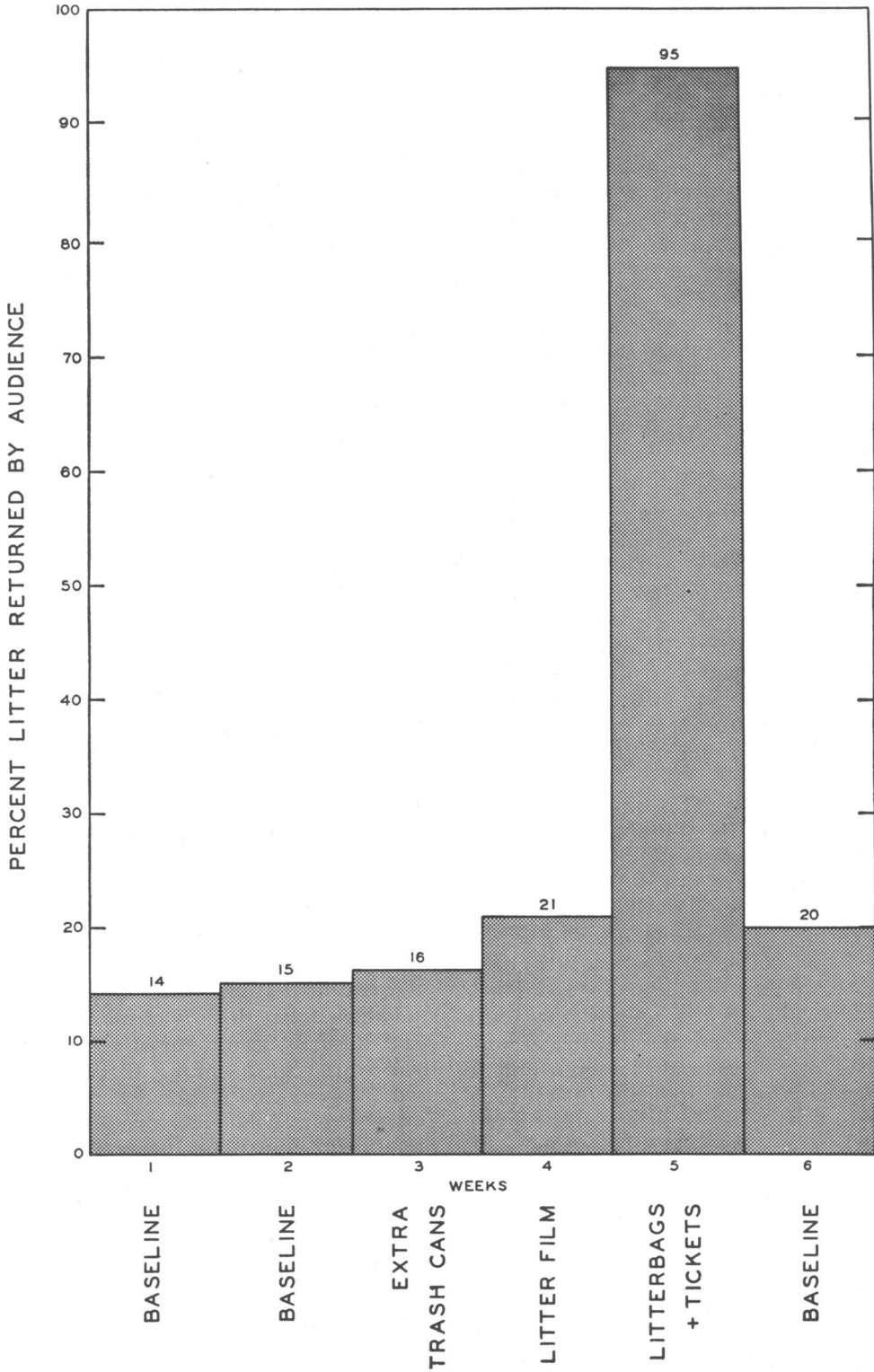


Fig. 2. Per cent of total litter in Theater 2 returned by audience during successive experimental conditions.

was second only to carelessness and indifference as a cause of litter (Keep America Beautiful, 1968). As reasonable as the "absence of trash cans" argument appears, the data from this study suggest otherwise. Doubling the number of trash cans in this study had no effect on littering.

Another common approach to combat littering is through propaganda campaigns designed to change people's presumed "attitudes" toward such behavior. Spot commercials on television exhort people to refrain from littering. Similar attempts are found in billboard announcements and advertisements in newspapers and magazines. Again, data from this study suggest that such attempts may scarcely be worth the effort and cost. The level of litter remained essentially constant after the showing of an anti-litter film.

A similar anti-litter approach is found in posted instructions proscribing littering or appealing for disposal of litter in appropriate receptacles. Examples include signs posted on highways and in public places, as well as anti-litter messages on cans, bottles, and packages. Data from this study suggest that such a tactic might help to alleviate the problem, at least where instructions can be given verbally. However, the study indicates such a solution is only partial since over 40% of the litter was still found on the floor after the audience was instructed to dispose of it.

Data such as these imply a need for alternative approaches to the problem of littering. One alternative is suggested from the experimental analysis of behavior. The following assumptions can be made. First, littering is a member of the more general class of operant behavior. Second, there are some rather immediate consequences of littering that may serve to maintain it at a high level. Carrying of litter is probably for most people aversive. Hence, its quick disposal by dropping it on the floor or ground or by throwing it out of a car window would be negatively reinforced. Third, other consequences, such as defacement of the environment, are more remote and, thereby, exercise much less control over the behavior. Legal sanctions such as fines may have little effect for precisely the same reason. The probability of being detected, arrested, and fined is simply too low and intermittent to control such behavior effectively.

These observations suggest that the level of littering might be reduced if immediate positive consequences contingent on anti-litter behavior could be scheduled. The present data clearly indicate that such a tactic is possible and effective. Using either one dime or a free ticket to another movie as reinforcers increased the total amount of litter returned by the audience to 94 and 95%.

To give the reader some idea of the quantity of litter involved and the consistency of the results regardless of the amount of litter, under the litterbag plus 10¢ condition, a total of 4869 grams of litter was in the theater at the end of the matinee. Of this, 4594 g (94%) were deposited in the trash cans. Under the litterbag plus tickets condition, there were 16,226 g of litter in the theater, of which 15,426 g (95%) were deposited in the receptacles. For comparison, under average baseline conditions one would have expected to find 84% (13,630 g) on the floor and only 16% (2596 g) in the trash cans had the special ticket not been offered. To illustrate further the effectiveness of the anti-litter incentives, the ratio of litter in trash cans to litter on the floor was changed from 1:5 under baseline conditions to 19:1 when free tickets were offered.

In conclusion, this study suggests the possible utility of employing positive reinforcement procedures to combat litter in other areas. Indeed, we are in the process of completing a similar analysis in a campground environment. Preliminary results again indicate the promise of the approach presented in this report. Hopefully, studies such as these will encourage others to carry out experimental analyses of ecological problems.

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