

*PROMPTING A CONSUMER BEHAVIOR FOR
POLLUTION CONTROL*¹

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A field application of behavior modification studied the relative effectiveness of different prompting procedures for increasing the probability that customers entering a grocery store would select their soft drinks in returnable rather than nonreturnable containers. Six different 2-hr experimental conditions during which bottle purchases were recorded were (1) No Prompt (*i.e.*, control), (2) one student gave incoming customers a handbill urging the purchase of soft drinks in returnable bottles, (3) distribution of the handbill by one student and public charting of each customer's bottle purchases by another student, (4) handbill distribution and charting by a five-member group, (5) handbills distributed and purchases charted by three females. The variant prompting techniques were equally effective, and in general increased the percentage of returnable-bottle customers by an average of 25%.

The ecological imbalance due to the accumulation of non-degradable waste products in the environment is steadily increasing. For example, it was estimated that the average American disposed of a ton of solid waste in 1970, and that this amount per individual should almost double by 1980 (Zikmund and Stanton, 1972). However, a large portion of household waste could be reused and thus become a resource rather than a pollutant. Such recycling requires appropriate relocation of particular trash items and therefore makes the consumer the first rather than the last link in the distribution channel (Margulies, 1970).

Recent behavioral approaches to the recycling problem have involved the development of contingencies for motivating individuals to collect waste materials from the environment, and techniques to increase the probability that a consumer will purchase soft drinks in returnable rather than throwaway containers. More specifi-

cally, children attending a movie theater (Burgess, Clark, and Hendee, 1971) and a national park (Hendee, Burgess, and Clark, 1972) collected a much greater proportion of litter from these environments when a pleasant event (*e.g.*, 10 cents, a theater ticket, or a Smokey Bear shoulder patch) was made contingent upon litter-collection behaviors than when such a reward system was not in effect. In addition, Hendee *et al.* (1972) showed that a majority of the returnable soda bottles that littered the campgrounds were collected in the absence of a reinforcement contingency, and concluded that contrived incentives are not needed to induce the gathering of such litter with a "built-in value". This latter result indicates that individuals are apt to complete their initial link in the recycling of returnable (*i.e.*, deposit) containers and therefore supports the antipollution significance of the attempts of Geller, Wylie, and Farris (1971) to increase the probability that customers will purchase their soft drinks in returnable bottles. The present study was a follow-up to the research by Geller *et al.* (1971) and evaluated the effectiveness of different prompting procedures for modifying bottle-buying behaviors.

The technique of introducing a particular stimulus in an environmental setting to increase

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the probability that a particular response will occur has been termed prompting by the operant psychologist (*e.g.*, Ayllon and Azrin, 1964) and point-of-purchase promotion by the advertiser (Tillman and Kirkpatrick, 1972). For example, to train appropriate speech patterns, behavioral managers often prompt appropriate verbalizations by first making the desired sound themselves; while to influence the purchase decisions of store customers, manufacturers advertise their products on posters, windows, floor stands, *etc.* at the place of product selection. The basic prompting technique used in the present research was the distribution of handbills to individuals entering a grocery store. The handbills were designed to influence a decision to purchase soft drinks in returnable rather than nonreturnable containers, and the efficacy of this behavior modification procedure was determined by comparing bottle-buying behaviors between Prompt and No-Prompt conditions.

METHOD

Subjects and Setting

Each individual who purchased soft drinks available in both returnable and nonreturnable containers at the Seven-Eleven (7-11) store in Blacksburg, Virginia during the observation periods of the present study served as a subject. Approximately one half of Blacksburg from which the subjects were sampled consists of faculty and students of Virginia Polytechnic Institute and State University; a majority of the remaining population is composed of families receiving income through farming or from one of three industrial plants.

The 7-11 store is a conveniently located "quick-stop" store in Blacksburg and consequently caters to a large proportion of the local inhabitants. Seven-Eleven never offered sales on soft drinks and thus confounding due to a changing economic factor was absent.³ More-

over, the store was small enough so that the customer's total time interval between entering and leaving 7-11 was usually short and could be observed. Thus, customers rarely entered the store during one experimental condition and left during another, but when they did, the data recording was adjusted (*i.e.*, the customer was considered in the condition under which he entered the store.)⁴

Recording

For each experimental condition, a Data Recorder and the Cashier of 7-11 independently recorded whether each patron who purchased soft-drinks was a returnable- or nonreturnable-bottle customer. An individual was defined as a returnable customer if he purchased more than 50% of his drinks in returnable bottles. Conversely, a nonreturnable customer bought 50% or more of his beverages in nonreturnable or throwaway containers. A returnable drink container was a bottle that the customer could later return to the store for a receipt of their deposit of 3 or 5 cents, depending on bottle size. Nonreturnable drink containers included both bottles and cans that were not returnable. Neither the drink flavors available in only one type of container (returnable or nonreturnable) nor the size of the container (*e.g.*, 32 oz or 12 oz) were considered when defining a customer's purchase as returnable or nonreturnable. When determining the proportion of store patrons who purchased more than 50% of their beverages in returnable bottles during each experimental condition, a customer was included in the calculation only if both the Cashier's and the Data Recorder's definition of that customer were the same. High interreliability of the independent data reports was demonstrated by the finding that for the entire project only one customer's purchases needed to be disregarded.

³Pilot research indicated that a prompting procedure could not counteract the marked effects of reduced prices.

⁴Pilot research in a large supermarket resulted in confounding due to customers' extended shopping periods and the inability to detect when customers left the store during a different experimental condition than that under which they entered.

Throughout the fourth week of the project, random customers who bought a majority of their drinks in returnable bottles were approached after leaving the store by a college student who introduced himself as a newspaper reporter. The student then asked the customer the questions listed in Table 1.

Table 1

Results of the Individual Surveys (N = 76)

Questions	Alternative Answers	Percentage
1. About how many handbills have you received at the 7-11 store this summer?	A. None	A. 09%
	B. 1-5	B. 43%
	C. 6-10	C. 16%
	D. greater than 10	D. 32%
2. About how many times per week have you shopped at 7-11 this summer?	A. Not once a week	A. 11%
	B. 1-5	B. 63%
	C. 6-10	C. 16%
	D. greater than 10	D. 10%
3. To what degree did you feel influenced by the students at 7-11?	A. Very influenced	A. 12%
	B. Influenced	B. 31%
	C. Slightly	C. 12%
	D. Not influenced	D. 36%
	E. Not answered	E. 09%
4. What were the students doing when you felt influenced?	A. No Prompt	A. 00%
	B. Handbill Only	B. 25%
	C. Pollution Chart	C. 11%
	D. Chart and Observers	D. 14%
	E. Not answered	E. 50%
5. Did you ever notice someone in the store taking notes while you were shopping?	A. Yes	A. 08%
	B. No	B. 79%
	C. Not answered	C. 13%
6. At the time you were shopping, did you think the notes were related to your behavior?	A. Yes	A. 08%
	B. No	B. 79%
	C. Not answered	C. 13%
7. Do you think the project was valuable?	A. Yes	A. 74%
	B. No	B. 08%
	C. Not answered	C. 18%

NOTE—All customers surveyed answered questions 5 and 6 identically. An entry in the "Not Answered" category usually occurred because the customer indicated that he was in a hurry and did not have time to answer all of the questions.

Experimental Procedures

The relative influence of various environmental manipulations on consumers' buying behavior during a four-week period was studied by assessing the proportion of returnable-bottle customers (as defined above) during several variations of a prompting procedure and a No-Prompt (*i.e.*, Control) condition. Specifically, for Design A, the four different 2-hr experimental periods (12 to 2 p.m., 2 to 4 p.m., 4 to 6 p.m., 6 to 8 p.m.) were manipulated within the four weekdays (Monday, Tuesday, Wednesday, Thursday) according to a Latin Square; and the four possible combinations of daily schedules were varied within each of four weeks according to a Latin Square. Consequently, for Design A, each of the four experimental conditions occurred at all possible time periods of the four weekdays. A second design (Design B) consisted of two Latin Square manipulations of four conditions over four weeks: one for Fridays and the other for Saturdays. Thus, for this design each 2-hr condition occurred once during each of the four different time periods on Friday and Saturday.

One of the four experimental periods of Design A and B was a Control or No-Prompt Condition, during which a Data Recorder lingered inside the store and inconspicuously⁵ tallied on prearranged charts the sex of each drink customer and the number of returnable and nonreturnable containers of each drink flavor purchased. The other conditions of each design represented variant methods of prompting customers to purchase their soft drinks in returnable bottles and, in addition to the Data Recorder, involved environmental manipulations by other individuals.

During the Handbill-Only Condition of each design, a Handbill Distributor stood at the store

⁵Pilot research demonstrated confounding due to the conspicuous presence of a Data Recorder. For example, even during a No-Prompt Condition customers approached the Data Recorder with questions like: "How's the recording going?" or "Got many nonreturnable customers today?"

entrance and gave each incoming customer a one-page handbill designed to urge the purchase of beverages in returnable bottles. The handbill was similar to that used by Geller *et al.* (1971), and was an 8.5 by 14 in (21.6 by 35.6 cm) sheet of white paper on which statements were printed as depicted in Figure 1. The "Notice" at the bottom of Figure 1 was included only on those handbills distributed when the Pollution Chart was used as described below. In cases when an individual refused to accept the handbill, the Distributor hand-signalled the data recorder inside the store to disregard the customer in his tabulations. However, the drink purchases of customers who rejected a circular, but also indicated that they received one earlier, were recorded. In such cases, the Distributor simply withdrew the handbill and replied: "Thank you for accepting our pamphlet previously, you have already received our message."⁶

In addition to the distribution of a handbill at the entrance of 7-11, the prompting procedure of the four other conditions included the use of a large Pollution Chart designed to make each customer's bottle purchase public (see Figure 2). The chart was located at the store entrance, where it could be easily observed by each customer before entering the store. Upon leaving 7-11, a Scorekeeper observed the number and type of containers each customer had bought and then manipulated a number disc on the chart to indicate publicly whether the customer was a returnable- or nonreturnable-bottle customer. When the chart was used, the handbill given to each customer was an 8.5 by 14 in. sheet of white paper with printing identical to the illustration in Figure 1. The message at the bottom of the paper was circled in red. For the experimental conditions involving both the handbill and the chart, the number or sex of

additional observers at the store entrance was varied.

During the Handbill and Chart Condition (Design A), two individuals stood adjacent to the door of 7-11. The Handbill Distributor gave the handbills to incoming patrons and when a customer left the store, the Scorekeeper manipulated the chart according to his choice of drink containers. The Handbill, Chart, and Group Condition (Design A) was carried out similarly except that during this condition, four Observers surrounded the chart when a customer entered and left the store. This latter procedure was hypothesized to be the most effective prompting technique of Design A, because the added group of observers should increase the probability that an incoming patron would notice the chart and subsequently be concerned about a public display of his contribution to the "Pollution Count".

The proportion of males and females working at each condition was a random variable except for the two handbill and chart conditions of Design B. Specifically, for the Handbill and Chart by Females Condition, one college co-ed gave each customer the handbill and two other females operated the Pollution Chart. The Handbill Distributor and two Scorekeepers were males for the Handbill and Chart by Males Condition of Design B. These latter two conditions were included in order to study whether the effectiveness of the handbill and chart might be affected by an interaction between the sex of the customer and the sex of the observers. Since the co-eds were indeed attractive in their summer attire it was hypothesized that male patrons would be more attentive to the prompting by females than by males. On the other hand, for female customers the prompting was expected to be more influential when done by males rather than females.

Throughout the project, the Data Recorder inconspicuously picked up handbills that had been improperly disposed of inside the store, while the Handbill distributor was responsible for retrieving handbills that littered the grounds

⁶Only twice during the total project did a person who flatly refused to accept a handbill become a drink customer. However, many drink customers indicated that they had already received the handbill previously; some of these customers accepted another handbill, some did not.

**BUY
RETURNABLE
SOFT
DRINK
BOTTLES**

SAVE MONEY

CONSIDERING DEPOSITS RETURNABLE
BOTTLES ARE 10¢ CHEAPER PER CARTON

SAVE TAXES

YOUR TAX DOLLARS WILL NOT BE SPENT
CLEANING UP HIGHWAYS

FIGHT POLLUTION

RETURNABLES ARE RECYCLED
NONRETURNABLES ARE PERMANENT POLLUTANTS

SHOW CONCERN

HELP US FIGHT POLLUTION THANKYOU

NOTICE

WE WILL RECORD YOUR PURCHASE ON THE
CHART

THIS EFFORT TO FIGHT POLLUTION WILL BE
REPORTED IN LOCAL NEWSPAPERS AND AT
THE AMERICAN PSYCHOLOGICAL ASSOCIATION

Fig. 1. The handbill given to incoming customers during the 2-hr Prompt conditions. The "Notice" at the bottom of the circular was included only when purchases were publicly recorded on the Pollution Chart.

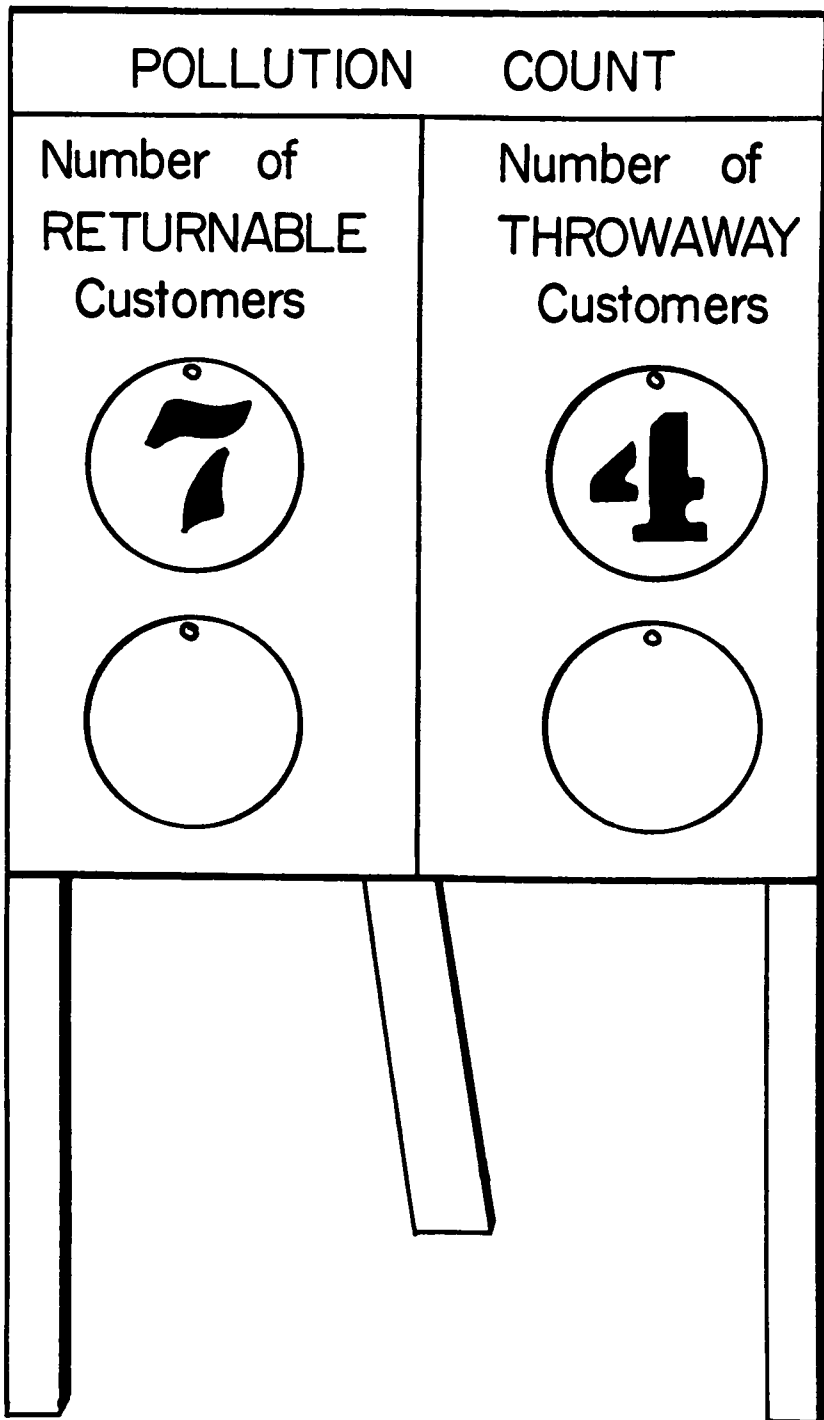


Fig. 2. The Pollution Chart used to indicate publicly the number of returnable and nonreturnable-bottle customers. After determining whether a customer purchased a majority or minority of returnable bottles, the Scorekeeper manipulated a numbered disc in the appropriate column to indicate an increment.

surrounding the store. Fortunately, most customers carried the handbill from the store premises, disposed of the handbill in receptacles provided at the entrance and exit doors, or gave the handbill back to the Distributor for recycling.

Personnel

Seven juniors and six seniors at Virginia Polytechnic Institute and State University alternated as Data Recorders, Handbill Distributors, Chart Scorekeepers, and Observers. Each student had previously completed a one-quarter behavior modification course taught by the senior author. Their work on the present project, including daily scheduled duties and attendance of bi-weekly seminars, fulfilled the requirements of an undergraduate research course. The second and third authors were the field supervisors of the

project and were senior psychology majors with more than 2 yr experience in behavioral research. Besides preparing project materials, arranging daily work schedules, and organizing the data for analysis, the field supervisors inspected the research activities during each 2-hr observation period of the project.

RESULTS

The left graph of Figure 3 depicts the proportion of returnable-bottle customers during each condition for consecutive weeks of Design A. The total number of bottle customers included in the derivation of the points ranged from 38 to 121 with a mean of 79. For the first three weeks the lowest proportion of returnable-bottle customers occurred during the No-Prompt Condition. During the fourth week, the

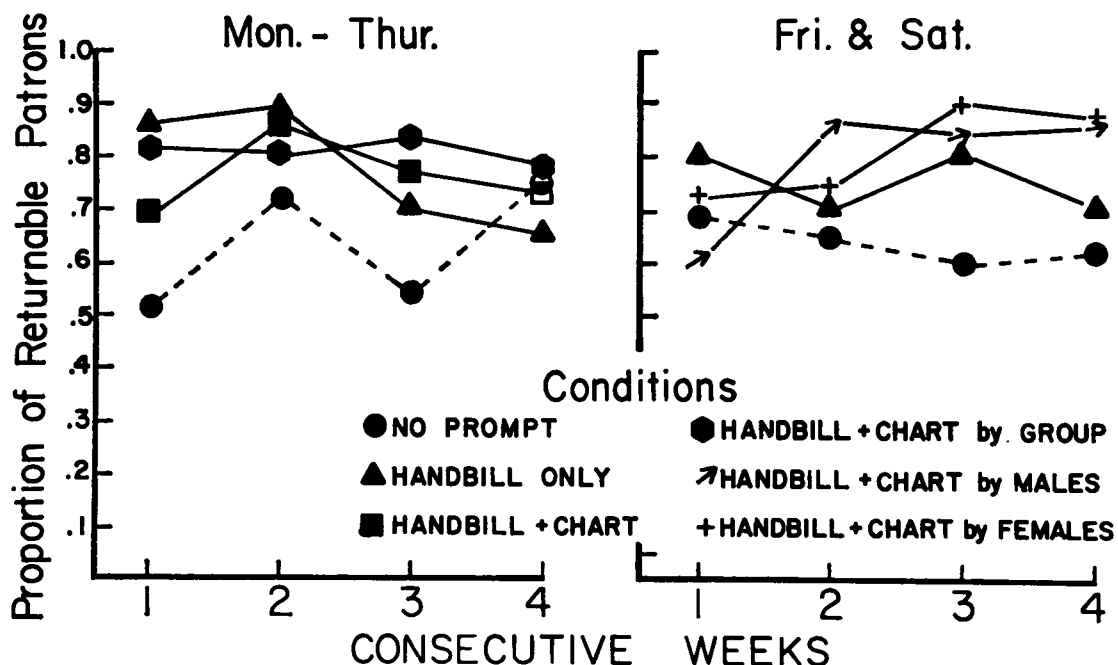


Fig. 3. Proportion of those customers purchasing soft drinks available in both returnable and nonreturnable bottles, who selected returnable bottles for more than half of their purchases. During the Handbill Only conditions, customers entering the store were given a handbill asking them to select returnable drink containers. During the Handbill and Chart Condition, each customer received the handbill and when leaving the store a Scorekeeper manipulated a Pollution Chart to indicate publicly whether a majority or a minority of the customer's drink containers were returnable. For the Handbill and Chart by Group Condition, four Observers surrounded the chart in addition to the Scorekeeper. The Handbill Distributor, the Scorekeeper, and two Observers were males in the Handbill and Chart by Males Condition and were females in the Handbill and Chart by Females Condition.

proportion for the No-Prompt Condition increased to the relatively higher level of the Prompt conditions. Comparisons between the points representing the different prompting methods of Design A show no consistent variations. Thus, the Handbill-Only Condition was apparently sufficient to influence some customers to purchase their soft drinks in returnable rather than throwaway containers; neither the addition of a Pollution Chart nor a social-pressure group seemed to facilitate the effect of the handbill. A separate analysis of the proportions for each day of Design A did not show any consistent trends attributable to the day of the week.

The right graph of Figure 3 illustrates the weekly proportions of returnable-bottle customers during each experimental condition of Design B. These results essentially replicate the the Design A findings of lower proportions of returnable-bottle customers during the No-Prompt Condition and no consistent differences between the variant prompting procedures. A separate analysis for each day revealed a more prominent effect of prompting for Saturdays than for Fridays. No consistent differences due to the sex of the customer were found on any day.

It is noteworthy that a comparison of the total number of returnable and nonreturnable soft-drink containers purchased during the experimental conditions of both designs demonstrated the same trends depicted in Figure 3. This finding is certainly reasonable when considering the observation that only 14% of all 7-11 customers during the four-week experiment purchased more than 12 drink containers; and 22% purchased just one drink. Only the Data Recorder tabulated the number of bottles bought during each experimental condition, whereas for the data graphed, the recordings made by the Cashier during all conditions and the number displayed on the Pollution Chart during chart conditions provided independent reliability checks on the Data Recorder's observations.

The results of the survey questions asked the returnable-bottle customers during the last week

of the project are indicated in Table 1. As demonstrated by the proportion of customers who selected each alternative of questions 1 and 2, many individuals shopped at the 7-11 store often and therefore were likely to experience several experimental conditions within one week. In particular, 89% of those surveyed stopped at 7-11 at least once a week; 26% of these customers indicated that they frequented 7-11 more than five times a week. The assumption that many 7-11 patrons experienced several Prompt conditions is further supported by the result that 91% of those interviewed had received the handbill at least once, and that 48% of these customers had received more than five handbills. Since only 8% of those surveyed noticed the Data Recorder (question 5), confounding due to the recorder's presence was relatively insignificant in the present study. It is noteworthy that 55% of those interviewed admitted to being influenced to some extent by a Prompt.

DISCUSSION

Both Designs A and B demonstrated that the percentage of individuals who buy beverages in returnable bottles may be increased when incoming customers are given a handbill designed to prompt the purchase of soft drinks in returnable rather than throwaway containers. Thus, the findings of a similar attempt to apply behavior modification principles on a community level for pollution control were replicated (Geller *et al.*, 1971). The utility of a prompt to influence anti-pollution behavior was also demonstrated when Burgess *et al.* (1971) found 26% more trash returned in litter bags by a theater audience that received verbal instructions (*i.e.*, a prompt) to use their litter bags than by an audience that received litter bags without the verbal prompt. The five different prompting techniques utilized in the present study did not produce consistent, differential effects. That is, neither the addition of a large Pollution Chart at the store entrance for recording individual bottle

purchases nor the presence of a group of observers surrounding the chart were shown to increase the effectiveness of the handbill.

In the earlier study of prompting effects on bottle buying, Geller *et al.* (1971) utilized an ABA design and took Baseline recordings for one week, prompted for two weeks of Treatment, and then removed the prompting procedure for three weeks of Follow-up. Not only were the daily observation periods too short to be representative samples in that study (*i.e.*, 1 hr), but the increased proportions of returnable bottle customers observed during the two-week prompting period probably were not the result of individuals changing their drink selections from the Baseline to the Prompt Condition. Instead, it is probable that the majority of customers whose drink purchases were recorded in the three conditions of that experiment were different individuals, and that the proportion changes between conditions were due to the effect of a particular shopping situation on separate samples of consumers. In the present study, the variations of 2-hr experimental conditions within each day provided more representative samples and made it likely that the drink selections of the same individual would be recorded during variant conditions of the experiment. In fact, the answers to questions 1 and 2 of the survey indicated that a majority of the 7-11 customers frequented the "quick stop" store several times and sometimes more than once a day. Indeed, after the first week, a majority of the individuals entering 7-11 during a Prompt condition (*i.e.*, more than 60%) indicated that they had already received the handbill. Hence, for the present research it is reasonable to assume that the modification of some individual behaviors was reflected by an observed increase in the proportion of returnable-bottle customers during prompting.

If prompting has a somewhat lasting effect on a customer's behavior, then the present research, which varied the treatments within days, might not be capable of differentiating the effects of slight procedural changes in the

prompting technique. With the observation that many persons shopped at 7-11 several times daily or weekly, data recorded during a given treatment period of the present study could have been biased by generalization effects of other experimental conditions that customers had previously experienced. Such a generalization factor provides an explanation for the finding that the proportion differences between conditions were least prominent during the fourth week of Design A and that the effects of the prompting conditions were more evident on Saturdays than on Fridays of Design B. Specifically, contamination due to long-term effects of a prompt on an individual's drink selections would be relatively less pronounced during the initial weeks of the project (*i.e.*, before a large percentage of the 7-11 patrons could experience more than one experimental condition.) Also, given an assumption that different customers patronize 7-11 on the weekend than on a weekday (*e.g.*, more than twice as many persons shopped on Saturdays than on Fridays), one would expect the generalization bias between the conditions of the week to be less during Saturday than Friday.

It is also likely that the crudeness of the dependent, behavioral measure in the present study limited the extent to which differential effects of various prompting procedures could be evaluated. That is, simply dichotomizing individuals into a "returnable" or "nonreturnable" category resulted in a gross index of behavior that was perhaps insensitive to variations in the prompting procedures. Hence, future research concerned with the application of behavioral technology in the community should attempt a refinement of the dependent variables. Indeed, the behavioral studies of litter behaviors by Burgess *et al.* (1971) and Clark *et al.* (1972) included very precise measures (*e.g.*, grams of trash, pieces of litter) but did not evaluate the behavioral change of individuals. Ideally, a behavioral approach to altering environmental pollution should record the rate of a given pollution behavior by individuals during independent Baseline, Treatment,

and Follow-up periods. We are at present engaged in a closer approximation to this model by distributing litter to individuals and observing where these individuals put the litter during Prompt and No-Prompt conditions.

In conclusion, the present study demonstrated that a relatively crude measure of consumers' behavior contributing to environmental pollution changed in an appropriate direction when handbills designed to prompt an alternative, nonpolluting behavior were distributed. Furthermore, in a follow-up survey, a large percentage of randomly selected customers was willing to admit that their purchase decisions were somewhat influenced by a prompt. However, differential effectiveness of various prompting techniques was not demonstrated and could have been due to an insensitive dependent variable or to the finding that most 7-11 customers frequented the store several times a week and therefore experienced more than one experimental condition in a week or even a day. In fact, with such contamination between the prompt and No-Prompt conditions it is remarkable that through the four-week project the lowest proportion of returnable-bottle customers usually occurred during the No-Prompt condition. Perhaps this result indicates that prompts

have a short-term effect and that the public should be continuously prompted or reminded of the appropriate behaviors for a particular milieu.

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