BEHAVIORAL ANTECEDENT INTERVENTIONS TARGETING ENVIRONMENTAL PROTECTION/PRESERVATION

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Among interventions designed to increase environmentally responsible behavior (ERB), antecedents and/or consequences can be classified as positive or negative. Federal, state, and local governments have most often used disincentives and penalties, as opposed to incentives and rewards to protect the environment (Geller, 1995a). Geller (1995b) maintains that negative attitudes by the public often follow the threat of a negative consequence, such as the enforcement of litter-control ordinances, and this is why mandated approaches result in short-term impact and limited generalization when the threat is removed.

However, mandated policies by the federal government have often been quite successful for fuel economy standards among automobile manufacturers, as well as for home appliance efficiency standards. Although success has been found with mandates, human dynamics clearly affect how much individuals resent the mandate (Kempton, Darley & Stern, 1992). For example, individual differences in reactivity likely play a strong role in determining the impact of behavioral response to these mandates. In a review of positive and negative consequences in environmental interventions, Lehman and Geller (2004) noted environmental behaviorists have generally favored rewards over penalties. This might be due to the negative association of punishers, and the high potential for reactivity (or counter control).

As will be seen from the studies reviewed below, research interest in interventions targeting ERB peaked around the mid 1970's, and then declined steadily through the 1980's and on. In spite of some successful demonstrations, behavioral scientists became discouraged by the

lack of support and the difficulty of working with large-scale systems, public policies, and deeply-ingrained cultural practices.

The general approach is to define specifically and objectively the ERBS that need to be changed (i.e., increased or decreased in frequency) and then manipulate environmental stimuli or events preceding and/or following a target ERB in order to effect behavior change in desired directions.

Antecedent Strategies Applied to Litter Behaviors

One of the most obvious examples of environmental degradation is litter. Litter, defined here as misplaced waste material (Geller, Winett, & Everett, 1982), is a form of environmental pollution that not only degrades the quality of the environment but also proves costly to taxpayers. A wide variety of ecological and monetary benefits result from a decrease in litter (e.g., an aesthetically cleaner and safer environment; reduction of solid waste in landfill areas; monetary savings for taxpayers; and energy conservation). A review of interventions used to encourage appropriate litter disposal reveals that most can be divided into either antecedent-based or consequence-based procedures. Dwyer and colleagues (1993) concluded both antecedent and consequence techniques were effective at increasing environmentally responsible behaviors (ERBs).

Numerous studies have manipulated antecedent conditions (e.g., prompts, trash receptacles) to prevent littering (e.g. Finnie, 1973; Geller et al., 1982; Miller, Albert, Bostick & Geller, 1976 Stern & Oskamp, 1987). However, research on picking up and disposing of other people's litter has shown minimal effects of prompts (Geller, 1987). For example, Bickman (1972) placed two empty soda cans near a trash receptacle in front of a college library. In one condition, passing pedestrians saw another college student (the model) kick one of the cans and

walk on, and in another condition the model picked up one of the cans and deposited it in the trash can. Of the 409 students and 97 nonstudents who passed the litter, only five students and three nonstudents (1.4%) picked up any of the planted litter.

Antecedent Strategies for Litter With No Specification of Consequence

In research by Finnie (1973), several field experiments were conducted in which a number of antecedent conditions were manipulated to successfully reduce the amount of litter accumulated during a given time. In one experiment, litter receptacles were established on one highway and compared to two other highways that did not have litter receptacles. Litter receptacles were rotated among the three highways every three months and each highway was cleaned before a change of conditions. Using the litter receptacles as neutral antecedents reduced roadside litter in the sample areas by 29%.

Geller, Brasted, and Mann (1980) evaluated effectiveness of highly decorated trash receptacles, as compared to ordinary containers, in an indoor shopping mall. Using an ABABA design of these neutral antecedents, results indicated highly decorated bird cans were more successful in encouraging litter deposits as compared to regular mall containers.

Antecedents Strategies for Litter Alerting the Availability of a Consequence

Powers, Osborne, and Anderson (1971) used litter stations with large cans with messages alerting individuals to payment for litter disposal in an area of a public forest. In this antecedent incentive strategy, decreased amounts of litter were found during the replication period for the experimental condition.

Results comparing conventional trash receptacles to ones designed to attract attention when litter was deposited (i.e., the word “THANKS!” was revealed when litter was placed in the trash can) revealed both the number of litter items deposited and the weight of litter deposited to

be much greater (approximately double) in the experimental container as compared to the conventional one. These findings indicate receptacles can be designed to increase proper litter disposal (O'Neill, Blanck, & Joyner, 1980).

In a study using both negative and positive antecedents (as well as reinforcement in the form of a prize), Baltes and Hayward (1976) promoted the use of distributed litter bags. In the positive prompting condition, participants in certain sections of a college football stadium received litter bags and the message prompt: "Pitch In! You will be a model for other people. You can help to cut down cleaning costs. Dispose of your litterbag after the game at the section exit." In the negative prompting condition, participants in others sections received litter bags and the message prompt: "Pitch In! Don't be a Litterbug. Others will disapprove of your littering. Litter can hurt. Dispose of your litterbag after the game at the section exit." Weight of litter remaining in designated sections showed all treatment conditions resulted in significantly less litter. However, there were no significant differences among the various strategies to encourage litter-bag usage.

The impact of a series of newspaper articles were assessed against measures of littering in target areas of a community using both positive and negative antecedents in one study. A feature article was published in a local newspaper, which included photographs of children picking up litter, along with pictures of some of the extremely littered areas along the street. The article contained an appeal to the public to help clean up the town, and a description of the feedback the newspaper was going to publish daily. It was found litter was reduced in each of the target areas only when the newspaper identified and gave feedback about that specific area (Schnelle, McNees, Thomas, Gendrich, & Beagle, 1980).

Antilittering campaigns can be viewed as attempts to increase the threats of shame and embarrassment for littering. In a study using self-report, Grasmick, Bursik and Kinsey (1991) found negative consequences of shame and embarrassment were significant motivators in an antilittering campaign. In 1987, after no previous effort to encourage citizens not to litter, Oklahoma adopted a twofold campaign, the Adopt-a-Highway program and the "Don't Lay that Trash on Oklahoma" program, consisting of highway signs and a media campaign. Results of surveys with questions concerning litter revealed the mean perceived risks of shame and embarrassment for littering were significantly higher in 1989 than in 1982. Perceived risk of shame and embarrassment were measured based on Likert scale responses to the items "Generally, in most situations I would feel guilty if I were to litter the highways, streets, or a public recreation area" and "Would most of the people whose opinions you value lose respect for you if you were to litter the highways, streets, or a public recreation area?" The increase in the risk of shame and embarrassment, between 1982 and 1989, were accompanied by a decrease in the proportion of respondents who reported they would litter.

Messages as Positive vs. Negative Antecedent Strategies for ERB

A majority of studies exploring the impact of antecedent prompts on behavior use a framework of messages identifying benefits of following recommendations (positive consequences) versus costs of not following the recommendations (negative consequences). Although these studies are limited in quantity, specifically those using messages as antecedent prompts specifying a consequence, there are several studies using positive and negative message prompts as antecedent strategies to target ERBs.

Winett (1978) evaluated the appropriateness and effectiveness of different kinds of prompts to conserve energy. In this field study, university-produced signs urging persons to

conserve energy were placed in rooms where lights were frequently left on, even when the rooms were unoccupied. These initial prompts had no effect, but in the next phase of the study, larger signs with specific information were placed near the exit point of the room, and lights were then left on for only 40% of the observation days.

In a study of prompting, signs and education were used to increase paper recycling in two college departments. Results of a multiple baseline design suggested by placing neutral signs, which did not imply a consequence, over trash and recycling containers, recyclables were increased from 51% in baseline to 84% in the experimental condition. This study demonstrated informational prompts on recycling to be effective when providing clear information regarding which materials are recyclable (Austin, Hatfield, Grindle, & Bailey 1993).

Durdan, Reeder, and Hecht (1985) examined sign specificity by comparing four types of antilittering signs. Signs were either general or specific, and the signs contained phrases that were either positively worded or negatively worded (negative signs stated: “Please don’t litter! Clear your own table”, while positive signs stated: “Please be helpful! Clear your own table”). A significant decrease in litter was found following sign prompts. No differential effects due to specificity were found for either the positive or negative signs. However, positively worded prompts were found to be more effective than negatively worded prompts. Additionally, littering increased significantly when the signs were removed. It is important to note that although this study examined evaluative tone of the antecedent message (positive vs. negative), these messages did not clearly indicate the availability of a consequence.

In similar research, Reiter and Samuel (1980) measured the effects of three sign conditions (threatening, cooperative, and no sign) and handbill litter in a parking garage. It was hypothesized that the sign with a threatening message (i.e., “Littering is Unlawful and Subject to

a $10 Fine.") would induce psychological reactance and therefore would be less effective than the sign emphasizing cooperation (i.e., "Pitch In!"). Results demonstrated the two types of signs posted both were effective in reducing the number of handbills littered, as compared to a no sign condition, but the cooperative (i.e. positive) "Pitch In" message was not found to be any more effective than the threatening (i.e. negative) "Unlawful" message. Since one message indicated the availability of a consequence ("Littering is Unlawful and Subject to a $10 Fine"), while the other did not indicate a specific consequence ("Pitch In!"), it might be argued that a methodology of implying a consequence for *both* antecedent messages within this study might have yielded quite different results.

A study by Geller, Witmer, and Orebaugh (1976) was designed to investigate the effectiveness of including antilitter instructions on materials that would pollute the environment if not disposed of properly (i.e., paper handbills). This study determined the behavioral effect of several variables, including methods of presenting specific vs. general disposal instructions, instructions to avoid a specified disposal location that included either a general or specific response alternative, instructions to litter in a specified location, and gender of individual who received the handbill.

In the methodology used for this study, individuals were offered a handbill while entering a grocery store (two grocery stores in Blacksburg were the setting of the study). On 40 consecutive days, handbills containing handwritten "Specials of the Week" were distributed. On some days, special instructions as prompts were included at bottom of handbill. Handbills were distributed to 100 males and 100 females each day. Following a distribution period, handbills were gathered from stores' premises and categorized, according to the location the handbill was left, on data forms. Special trash cans used for study of specific vs. general instructions were

placed strategically throughout the stores. The type of instruction included at the bottom of handbills was manipulated across five conditions, which were alternated daily for 5 weeks. The five conditions were as follows: 1) baseline – no antilitter prompt; 2) general antilitter prompt: “Please don’t litter. Please dispose of properly”; 3) specific antilitter prompt “Please don’t litter. Please dispose in green trash can located at rear of store”; 4) Demand antilitter prompt “You must not litter, you must dispose in green trash can located at rear of store”; 5) recycle prompt: “Please help us recycle. Please dispose for recycling in green trash can located at rear of store”.

Results demonstrated of all four of the prompt conditions at each store, the instructions to recycle yielded the largest proportion of disposals in the specified can. A general antilitter message on handbills reduced handbill litter of shelves, counters, and display tables of one grocery store by more than 50%. Instructions demanding a certain response (i.e., negatively-worded prompt) were as effective at generating compliance as instructions implying a polite request (i.e., positively-worded prompt). The greatest proportion of litter occurred during baseline conditions. Observed effects of the various prompts were found to be similar for both males and females. The authors concluded the results found here suggest some littering behaviors might be decreased by displaying specific antilitter instructions in the environmental setting. It is important to note this study investigated general vs. specific prompts, and included positively- worded vs. negatively-worded messages; however, these prompts did not specifically announce the availability of a consequence.

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