

REDUCING CIGARETTE SMOKING IN SUPERMARKETS AND ELEVATORS

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ABSTRACT

Practically all nonsmokers are passive smokers since they are repeatedly forced to breath cigarette-smoke polluted air in public settings. The present experiment investigated various behavioral stimulus and consequence control strategies directed towards reducing smoking behaviors in settings frequented by nonsmokers. The first tactic, posting no-smoking signs, failed to reduce the rates of smoking in a Chicago supermarket. When a research assistant approached smokers and requested them to put out their cigarettes, over 90 per cent complied. The second study took place in elevators, a particularly troublesome behavior setting for nonsmokers. Using an ABAB design, a relatively simple consequence control tactic (politely requesting smokers to extinguish their cigarettes) produced dramatic reductions in smoking behaviors in elevators.

Nonsmokers are repeatedly exposed to smoke-filled environments. This is particularly troublesome given the report issued by the Surgeon General which indicated that passive smoking is hazardous to the health of nonsmokers [1]. A single cigarette smoked generates approximately six times more secondary smoke (that which emerges from the burning cone) than mainstream smoke (particle matter exhaled by the smoker) [2]. In addition, there are more pernicious chemical components in secondary smoke than in mainstream smoke [3]. In poorly ventilated behavior settings where smoking occurs, carbon monoxide and nicotine levels can exceed the national ambient air quality standards for major air pollutants [4].

Diverse studies have indicated the deleterious effects of passive smoking. Exposure to smoke while studying has been found to significantly increase anxiety, fatigue [5], and aggression [6]. When taking examinations, nonsmokers obtain significantly lower scores in smoke contaminated rooms [7]. Over eight million nonsmokers, with allergies sensitive to tobacco smoke, report discomfort and respiratory symptoms after exposure to smoke [8]. Speer found 73 per cent of allergic individuals and 69 per cent of nonallergic persons complained of eye itching, burning, and swelling when exposed to cigarette smoke [9]. Cameron found that after exposure to smoke, many children suffer from eye, nasal and throat irritations, become nauseous or dizzy, or begin to cough [10]. Children subjected to cigarette smoke in their home environment show a greater prevalence of acute illnesses [11], and infants of mothers who smoke have a greater risk of being hospitalized for bronchitis and pneumonia [12]. The growing evidence pointing to the negative impact of passive smoking indicates a need to develop strategies to help nonsmokers exert more control over smokers in public settings.

Several studies have been directed toward investigating the impact of no-smoking signs on smoking behaviors. Jason found that posting a no-smoking sign in a faculty office eliminated smoking [13]. In that study, however, it is possible that the presence of the sign and an authority figure led to the smoking reduction. A study by Auger, Wright, and Simpson found no reductions in smoking in classrooms or the cafeteria of a children's mental health center after posting of no-smoking signs [14]. These studies suggest that signs alone might be ineffective. However, greater compliance might be obtained with signs and the presence of individuals willing to enforce their explicit message.

The present study investigated the efficacy of several stimulus and consequence control techniques in reducing cigarette smoking in supermarkets and elevators. In the supermarket, during different phases, no-smoking signs were posted, and a research assistant approached smokers and asked them to extinguish their cigarettes. In the elevators, where no-smoking signs were already posted, smokers were asked to extinguish their cigarettes.

STUDY 1

Method

The managers of two Jewel supermarkets located in middle-class, northern parts of Chicago, agreed to participate in an experiment aimed at evaluating strategies for reducing smoking behaviors in public settings. The Illinois law prohibiting smoking in supermarkets was not enforced and customers frequently smoked cigarettes. Both managers were interested in reducing customer smoking behaviors. Both supermarkets had sections for frozen foods, fruit, meat, and dairy products, as well as a customer-information booth and five cash registers. Supermarket A had eight food aisles and Supermarket B had six.

Dependent Measures

The number of people smoking and time smoking were recorded in the check-out areas (defined as the rectangular space bordered by the aisle corners and cash registers) between 3:00-3:30 (Supermarket A) and 4:00-4:30 (Supermarket B). If a smoker walked in the observed area and subsequently left the area and then returned, the smoker would be counted only once. Smoking behaviors were timed with a stopwatch and were defined as the amount of time a cigarette was lit. If two customers were observed smoking, the amount of time in which each smoked was added together. Three pipe smokers were excluded from data analysis. Whether customers extinguished their cigarette (in ≤ 30 seconds after being approached) was also recorded.

Experimental Conditions: Supermarket A

Signs and prompting – Nine eight by eleven inch black and red lettered “no-smoking” signs were posted. Signs were placed on the entrance and exit doors, three were posted by the meat section, and others were placed adjacent to the fruit, milk, frozen foods, and customer-information booth. These signs remained posted throughout the succeeding phases of the study. For nine days a research assistant approached smokers at the check-out section of the supermarket and politely said, “Would you please put out your cigarette?”

Signs – For the succeeding nine days, only the stimulus control effects of the signs were operating. The research assistant was present at the check-out section each day.

Signs and prompting – During the final nine day phase, the undergraduate research assistant approached customers and asked them to please put out their cigarettes.

Experimental Conditions: Supermarket B

No-smoking signs were not present in the three phases described below.

Baseline – For seven days, a research assistant monitored smoking by the supermarket’s check-out area.

Prompting – An undergraduate research assistant approached customers by the check-out area and politely asked them to extinguish their cigarettes. (This phase lasted nine days.)

Baseline – During the final nine days, no customers were approached, but smoking behaviors in the check-out area were monitored.

Reliability

On four occasions, two independent observers counted smokers, time smoking, and rated whether the cigarettes were extinguished after prompting.

RESULTS

Reliability

The two observers attained perfect agreement on the frequency of smokers and the number who put out their cigarettes after being approached. The observers reached an average 82 per cent agreement on seconds of smoking in this area (this percentage was computed by dividing the smaller time estimate for each day by the larger estimate).

Supermarket A

Figure 1 depicts the relationship between smoking patterns and experimental manipulations. When prompting conditions were eliminated, smoking behaviors in the check-out area increased dramatically, whereas reinstating these conditions led to an immediate reduction in seconds of smoking behavior. Of 169 individuals smoking, 160 put out their cigarettes when prompted (95% compliance). (See Figure 1.) In Figures 1 and 2, each unit equals 100 seconds.

Supermarket B

Figure 2 demonstrates the functional relationship between implementation of the prompting condition and a decrease in time smoking. During the prompting condition, seventy-four of eighty approached customers (93%) complied with the request to extinguish their cigarette. (See Figure 2.)

STUDY 2

Method

The elevators selected for the study were located within three buildings in downtown Chicago. There were seven elevators and sixteen floors in the first building, twenty elevators and thirty-two floors in the second, and twenty-one elevators and forty-eight floors in the third building. All elevators were automatically operated. In each elevator, there was a five-and-one-half by seven-and-one-half inch certificate of inspection, with the words "no smoking" on it.

Each day of data collection, a research assistant rode from the bottom floor to the top floor and then back to the bottom floor in three elevators in the

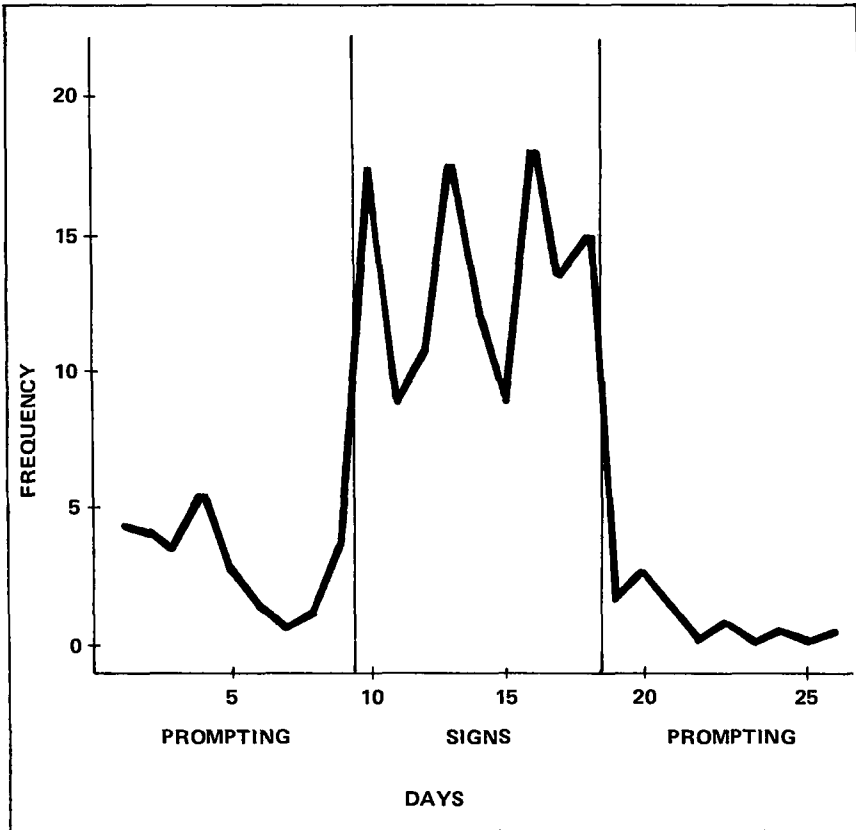


Figure 1. Time smoking in Supermarket A's check-out area.

first building, three in the second, and four in the third building. Data collection began at 12:00 each day. The research assistant rode the elevators for approximately twenty minutes each day. The order of riding elevators was constant.

Dependent Variables

Throughout the study, the investigator recorded the number of passengers who entered the elevator with a lit cigarette, cigar, or pipe (or those who lit a cigarette, cigar, or pipe while riding the elevator). The investigator also recorded the number of smokers who put out their cigarette, cigar, or pipe (while in the elevator); and the number of seconds in which a cigarette, cigar, or pipe was lit. A stop watch was used to record the latter variable.

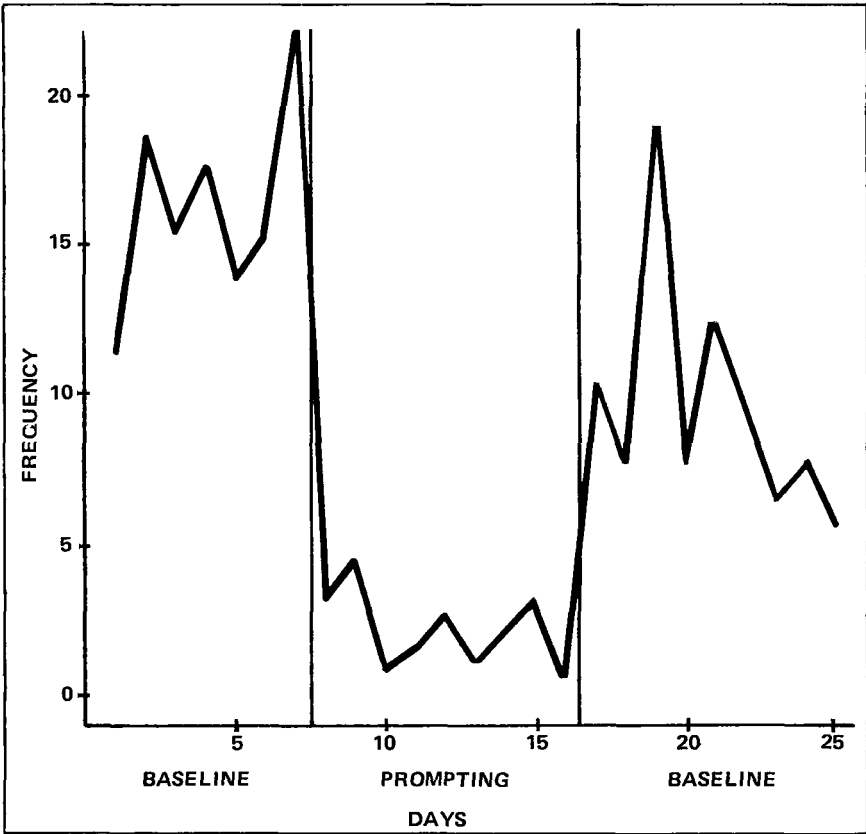


Figure 2. Time smoking in Supermarket B's check-out area.

Experimental Design

An ABAB design was employed with each phase lasting five consecutive days (Monday through Friday).

Baseline – During this phase, naturalistic rates of smoking were monitored.

Intervention – During this phase, the investigator approached any passenger who entered the elevator with a lit cigarette, cigar, or pipe (or those who lit a cigarette, cigar, or pipe while riding the elevator) and politely said, “Will you please extinguish your . . . (cigarette, cigar, or pipe)?”

Baseline – Again, naturalistic rates of smoking were monitored.

Intervention – Intervention procedures were again implemented.

Reliability

Reliability occurred on six separate occasions; at least one took place during each experimental phase. Two observers independently recorded data during these reliability trials.

RESULTS

Reliability

Interrater reliability for the three dependent variables (number of smokers, the number who extinguished their cigarettes and the seconds smoking) was obtained by dividing the smaller obtained frequency by the larger one. The two observers reached a mean agreement of 100 per cent, 100 per cent, and 97 per cent respectively.

Passengers' Smoking Behaviors

Figure 3 presents the number of seconds passengers smoked across the different experimental phases. During the first baseline period, smoking occurred an average of 399 seconds. After implementing treatment procedures, smoking declined dramatically to an average of 93 seconds. Smoking increased modestly during the second baseline period and decreased again with reimplementing of treatment procedures. During the two treatment procedures, 111 out of 118 smokers (94%) complied with the request to extinguish their cigarette. (See Figure 3.)

DISCUSSION

The study's major finding was that cigarette smoking in the check-out area of supermarkets and in elevators could be reduced when a prompting technique was used. Such findings suggest that the recalcitrant problem of cigarette smoke in public settings can be ameliorated if smoking behaviors are closely monitored and immediately prompted.

In the first study, no-smoking signs did not effect reductions in smoking behaviors. A clear documentation of this finding occurred in Supermarket A; following the prompting conditions, time smoking increased considerably in the presence of only the no-smoking signs. Although signs represent a wide-spread stimulus control strategy, the present findings suggest their efficacy in controlling behavior might be minimal, particularly when compliance and noncompliance are not conequated.

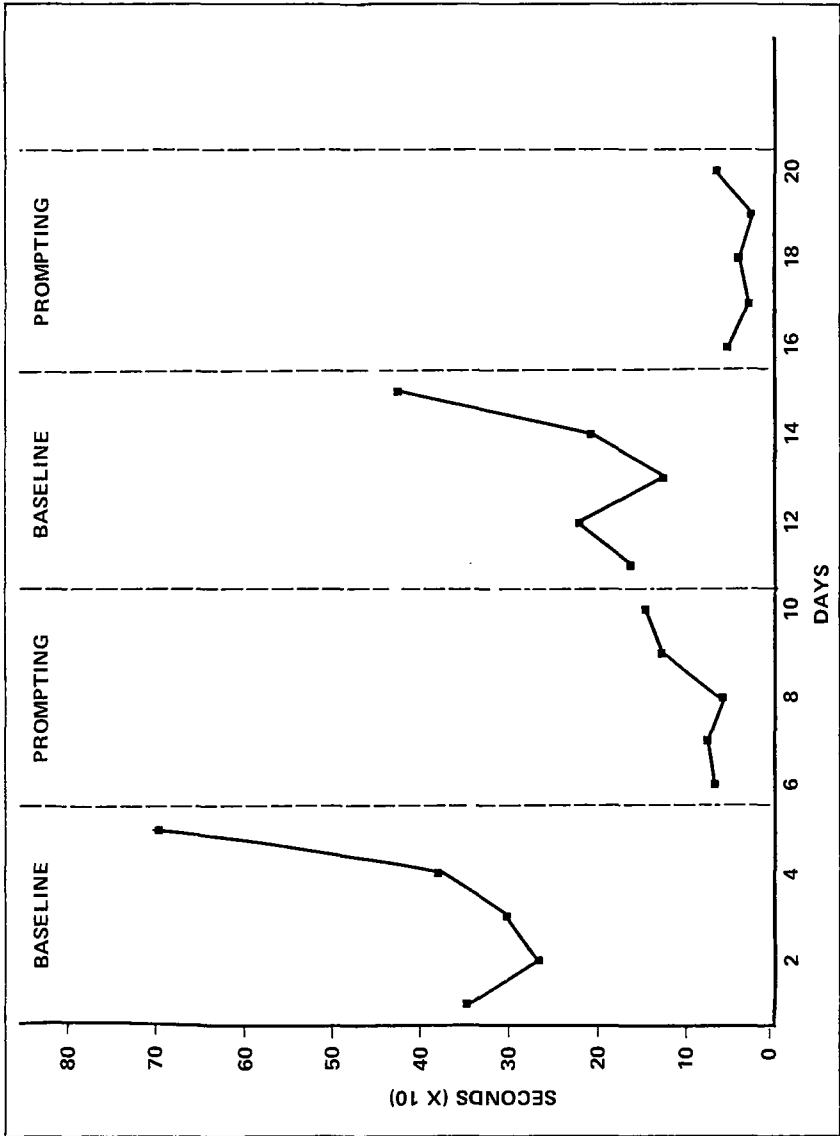


Figure 3. Seconds smoking in elevators.

In each elevator there was a sign with the words "no smoking" on it. Apparently, this stimulus control tactic was not effective in eliminating smoking in the elevators. If the ordinance prohibiting smoking in elevators was enforced by police, then more smokers might refrain from smoking in elevators. Alternatively, if nonsmokers become more assertive and vocal in their rights to breathe nonpolluted air by consequencing smoking episodes, the present study indicates that levels of exposure to smoke would be considerably reduced.

The prompting condition represented an effective, simple, straight-forward approach which resulted in high compliance rates. Approaching customers or riders with a smile and politely requesting them to extinguish their cigarette is a remarkably effective strategy, having no observable negative consequences. "Sensitive" smokers, who complied with the request, tended to remain friendly and cooperative (several pointed out other smokers; many positively greeted the prompter). Many nonsmokers commended the prompter for his laudable service in militating against smoke pollution.

It might be argued that smoking in large supermarkets or elevators does not constitute a health hazard to nonsmokers. Even if smoking in these settings did not negatively effect individuals with heart disease, those with allergies, or pregnant women; the fact that smoking was illegal and that an ordinance was being violated provides a strong rationale for conducting the present investigation.

The two studies reported herein represent the first demonstrations of the experimental analysis of smoking behaviors in public settings (i.e., smoking patterns can be systematically and reliably monitored and controlled). Future research efforts might profitably be extended to other organizational-level (e.g., cafeterias, etc.), community (e.g., mass transit systems), and societal-level targets (i.e., effecting changes in voting behaviors in legislators who create laws proscribing smoking behaviors in various community and organizational entities). Behavioral community psychologists also need to invest more effort in devising primary preventive strategies (i.e., preventing youngsters from beginning to smoke), sensitizing smokers to the rights of nonsmokers (e.g., teaching smokers to inquire whether smoking bothers their nonsmoking friends), and engineering environments which preclude the act of smoking (e.g., alarms could ring when cigarette smoke is emitted in restaurants).

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REFERENCES

1. Congressional Record, Proceedings and debates of the 92nd Congress, second session, 118:72, 1972.
2. R. J. Naumann, Smoking and Air Pollution Standards, *Science*, 182, pp. 334-336, 1973.
3. U. R. Hoegg, Cigarette Smoke in Closed Spaces, *Environmental Health Perspectives*, 2, pp. 117-128, 1972.
4. *The Health Consequences of Smoking, 1975*, U. S. Department of Health, Education and Welfare, Public Health Service, Center for Disease Control, DHEW Publication No. (CDC) 76-8704, 235 pp., 1976.
5. J. W. Jones, *The Effects of Secondary Cigarette Smoke on Acute Emotional States*, Submitted for publication, 1978.
6. J. W. Jones and M. J. Durbin, *Secondary Cigarette Smoke and Negative Evaluation as Factors in Aggressive Behavior*, Submitted for publication, 1978.
7. A. H. Kidd, Relation of Examination Scores to Tobacco Smoking, *Perceptual and Motor Skills*, 36, p. 946, 1973.
8. B. M. Zussman, Tobacco Sensitivity in the Allergic Population. A Specific Allergic Entity, *Journal of Asthma Research*, 11, pp. 159-167, 1974.
9. F. Speer, Tobacco and the Nonsmoker, *Archives of Environmental Health*, 16, pp. 443-446, 1968.
10. P. Cameron, Second-Hand Tobacco Smoke: Children's Reactions, *Journal of School Health*, 42, pp. 280-284, 1972.
11. P. Cameron and D. Robertson, Effect of Home Environment Tobacco Smoke on Family Health, *Journal of Applied Psychology*, 57, pp. 142-147, 1973.
12. S. Harlap and A. M. Davies, Smoking in Pregnancy and Child Development, *British Medical Journal*, 2, p. 610, 1974.
13. L. A. Jason, Eliminating Smoking Through Stimulus Control, Paper presented at the Association for the Advancement of Behavior Therapy, New York, December 1976.
14. T. J. Auger, E. Wright, Jr., and R. H. Simpson, Posters as Smoking Deterents, *Journal of Applied Psychology*, 56, pp. 169-171, 1972.

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