

*REDUCTION OF CIGARETTE SMOKING IN A
UNIVERSITY CAFETERIA*

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Passive smoking has been shown to be hazardous to the health of nonsmokers. Given this documented link between exposure to smoke-filled environments and deleterious health consequences, there is a need to develop effective procedures that establish and maintain no-smoking areas in various public settings. The present study focused on decreasing cigarette smoking in a section of a university cafeteria. Posting of no-smoking signs was found to decrease levels of smoking only minimally. However, when smokers were verbally prompted not to smoke, in the presence of the signs, marked decreases in smoking occurred in the target area.

DESCRIPTORS: passive smoking, verbal prompting, cafeteria, behavioral community psychology, environmental research

The deleterious consequences of passive smoking have been documented at all age levels. Goldstein (1977) has estimated that 4,600 babies die each year in the perinatal period because their mothers smoke. Exposure to cigarette smoke enhances the risk of sudden infant death syndrome (Bergman & Wiesner, 1976), increases the incidence of infant admissions to hospitals for bronchitis and pneumonia (Harlap & Davies, 1974), and elevates the risk of acute illnesses for children (Cameron & Robertson, 1973). After exposure to smoke, many youngsters suffer from eye, nasal, and throat irritations; become nauseous and dizzy; and begin to cough (Cameron, 1972).

In studies with adult populations, exposure to smoke has been found to increase anxiety, fatigue, and aggression significantly (Jones & Bogat, 1978). When taking examinations, nonsmokers obtain significantly lower scores in smoke-contaminated rooms as opposed to non-contaminated rooms (Kidd, 1973). Passive smoking has been shown to increase levels of carbohemoglobin (Russell, Cole, & Brown, 1973), a condition adversely affecting coronary

heart disease (Aronow, 1974). Furthermore, over eight million nonsmokers with allergies clinically sensitive to smoke report discomfort and respiratory symptoms after exposure to smoke (Zussman, 1974). Even among those who are nonallergic to smoke, 69% complain of eye itching, burning, and swelling when exposed to cigarette smoke (Speer, 1968). Given the above findings, a need exists to develop strategies to reduce or eliminate smoke in settings frequented by nonsmokers.

A commonly used tactic for attempting to control smoking behaviors in diverse settings is placement of no-smoking signs. Signs, a behavioral stimulus control strategy, have been effectively used with other diverse problems, including: shoplifting (McNees, Egli, Marshall, Schnelle, & Risley, 1976), turning off lights in unoccupied rooms (Winett, 1978), and littering (Geller, 1980). A few studies have investigated the use of stimulus control strategies in reducing cigarette smoking. For example, smoking was eliminated in a faculty member's office when a no-smoking sign was posted (Jason, 1979). These results, however, might have been due to the smokers' reluctance to violate a posted rule when an authority figure was present. A polite request not to smoke in combination with signs

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has been effectively used to reduce smoking in elevators, supermarkets (Jason, Clay, & Martin, 1979-1980), and a barber shop (Jason & Clay, 1978). However, the unique contribution of signs in these interventions has not been determined.

Although some studies have pointed to the effectiveness of verbal prompting in reducing smoking behaviors (Jason, 1979; Jason & Savio, 1978), it is important to investigate the use of no-smoking signs in controlling cigarette smoking. The present study used a withdrawal design to assess the effectiveness of signs alone and signs plus verbal prompts in reducing cigarette smoking in a university cafeteria.

METHOD

Setting

The study was conducted in a university cafeteria measuring 23.32 m by 20.57 m. The target area was a no-smoking section of the cafeteria measuring 10.29 m by 10.29 m and containing 13 round tables (each with diameters of 1.52 m). The cafeteria did not have a no-smoking section before the study began.

Measures

Each day of the week, from 12:00 to 12:50 p.m., observers recorded the number of individuals who smoked one or more cigarettes and the number of seconds any smoking was occurring within the target area. Observers used stopwatches to monitor smoking behavior continuously. In addition, the number of people within the no-smoking area at 12:00 and 12:50 was noted.

Experimental Design

Baseline 1. For a 10-day period, normal rates of smoking were monitored within the target area.

Sign prompting 1. During the next 16 days, a .08 m by .14 m tentlike sign was placed on each table, with the following words on it: "No-Smoking Section for health and comfort

of patrons." In addition, four larger signs (.71 m by .46 m) were placed on walls, with the following words on them: "No-Smoking Section. Please Don't Smoke in this Section."

Baseline 2. Baseline conditions were reestablished for the next 5 days.

Sign prompting 2. The signs were placed in the no-smoking area during this 10-day period.

Sign and verbal prompting 1. In addition to the sign intervention, a university student approached smokers and said, "I'm concerned about keeping this section for nonsmokers. Would you either stop smoking in this area or move to the smoking area?" After 5 min, if smoking continued, the prompter said, "I'd just like to once again remind you that this is a no-smoking section. Would you please not smoke here?" There were three university students who served as prompters.

During this condition, observers recorded the occurrence of three categories of behavior: (1) compliance with the initial request not to smoke (i.e., the smoker extinguished the cigarette within 5 sec or stopped while in the act of lighting a cigarette); (b) partial compliance (i.e., the smoker said that after finishing the cigarette, another one would not be lighted, or extinguished the cigarette within 5 sec after a second prompt; or (c) noncompliance (i.e., the smoker did not extinguish the cigarette within 5 sec of a first or second prompt, or did not state that after finishing the cigarette, another one would not be lighted).

Sign prompting 3. During this 8-day phase, only the signs were used to control cigarette smoking.

Sign and verbal prompting 2. For the last 5 days, signs and prompting were again used.

Follow-Up

At study end, the findings were presented to the manager of food services as well as the director of the center in which the cafeteria was located. Both individuals agreed to maintain a no-smoking section. In addition, an individual responsible for collecting unreturned trays was

assigned to request politely that smokers not smoke in the designated no-smoking area. Three months following the end of the study, the no-smoking section had been moved to a new area in the cafeteria. Using an observation system similar to that described above, four data points were collected at a 3-mo follow-up (each observation was separated by a week). No smokers were observed at data points 1, 3, and 4; three smokers were observed at data point 2. At this second observation, an undergraduate (without any prompting by the investigators) approached two of the smokers, requested that they not smoke in this nonsmoking section, and both complied. The third smoker who was sitting on the border of the no-smoking section was not approached (this person smoked for 15 min).

Social validity. When the study ended, an attempt was made to determine whether or not cafeteria users thought it was important to have a nonsmoking section. The University Food Committee, an independent monitoring group of students and university personnel, distributed a questionnaire; 120 students filled out the questionnaire. One of the items on it stated: "Do you feel there should be a permanent no-smoking section in the cafeteria?" The students were asked to answer this question using a 5-point scale (1 = definitely no; 2, no; 3, not sure; 4, yes; 5, definitely yes).

Reliability

Reliability was assessed on eight occasions during the study, and at least once per experimental condition. Interrater reliability estimates for the number of smokers, seconds smoking, and the number of people were calculated by dividing the smaller estimate by the larger estimate. Reliability estimates for compliance to prompting were calculated using the formula: $\text{agreements}/(\text{agreements plus disagreements})$. Interrater reliability for the number of smokers was 100%; the number of seconds smoking occurred, 98% (range 95-100%); and the number of people, 99% (range 99-100%). For compliance data, interrater reliability was 100%.

RESULTS

Smoking Behavior

Figure 1 presents the number of smokers and minutes smoking across experimental phase. During the two baseline phases, cigarette smoke was emitted for an average of 39 out of the observed 50 min. An average of 7.7 individuals were observed smoking in the target area per day. During the sign phases, the average number of smokers was 5.3 per session, and cigarette smoke was observed for an average of 26 min. The most effective condition was signs plus prompting. An average of 1.6 smokers were observed smoking an average 6.2 min during this prompting phase. The majority of approached smokers complied with the request to stop smoking (54% complied; 27% partially complied; 19% did not comply).

There were fewer people in the no-smoking section during the intervention phases. In the two baseline phases, there was an average of 27.4 people. (This number was obtained by taking the average of the number of people at the beginning and end of the session, and then calculating an average of these averages for each experimental phase.) During the sign phases there was an average of 25.5 individuals; and for the two sign plus prompting phases, there was an average of 22.1 people.

Social Validity

In regard to student attitudes about establishing a permanent no-smoking section, the following responses were obtained: 44%, definitely yes; 30%, yes; 12%, not sure; 7%, no; 6%, definitely no; 2%, didn't respond.

DISCUSSION

The present study found verbal prompting to be relatively effective in reducing levels of cigarette smoking in a university cafeteria. Most smokers complied with a polite request not to smoke by either stopping or moving to another section of the cafeteria. The request to stop

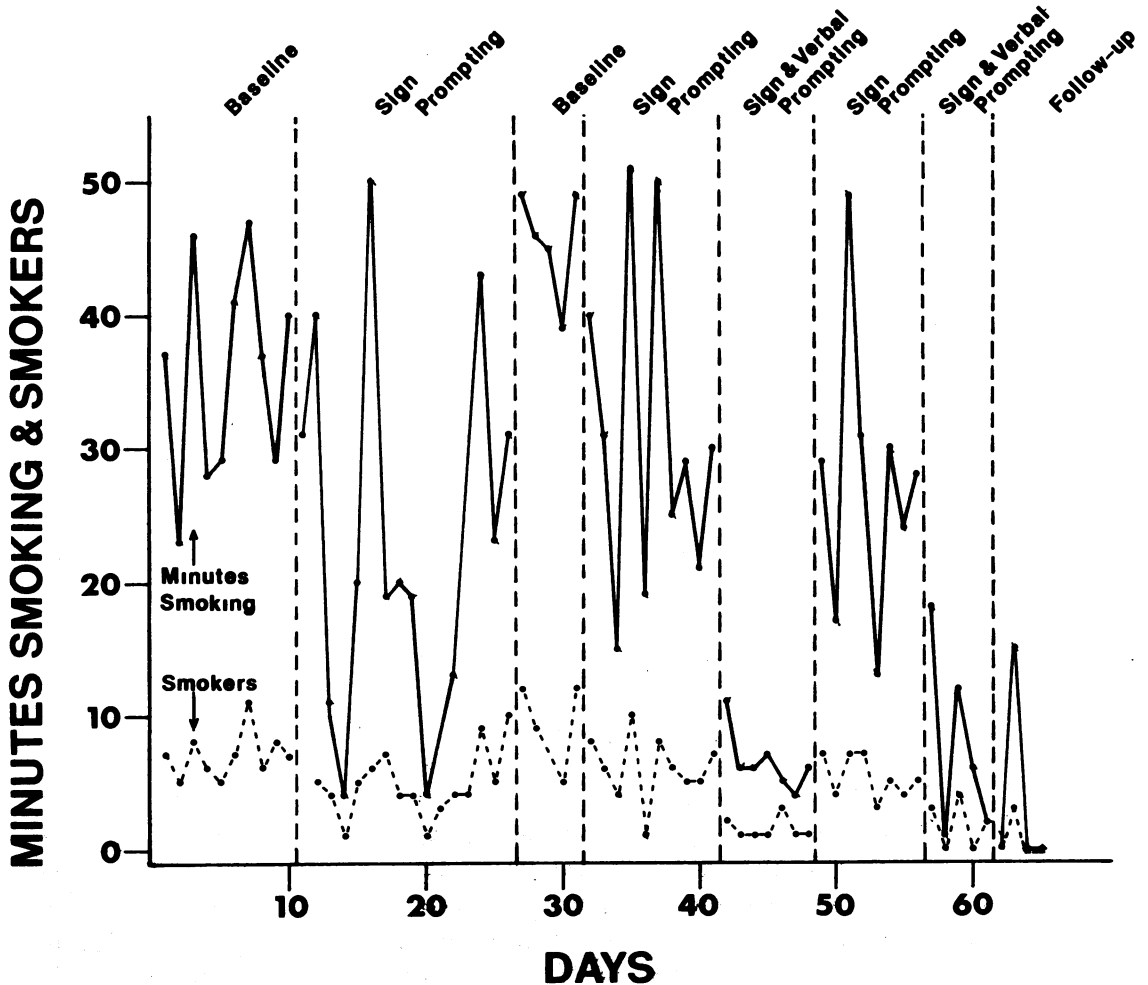


Fig. 1. Minutes smoking and number of smokers observed in the cafeteria's no-smoking section across experimental conditions. (— = minutes smoking; - - - = number of smokers.)

smoking could be viewed from a punishment paradigm since a person engaging in a behavior was requested to discontinue that behavior.

It is possible that prompting alone might have been as effective as the combination of signs and prompting. The university officials felt that prompting should only occur with visible stipulation of rules governing the no-smoking area. In other words, they felt students might justly complain that somewhat unreasonable requests were being made if prompts occurred without visual stimuli designating the area as one for nonsmokers. The investigators decide to comply

with the wishes of the university officials responsible for managing the cafeteria.

Signs can either prompt the occurrence of approach oriented behaviors, or as in the present study, request the avoidance of certain responses. The sign intervention brought about only minimal changes in smoking behavior. Although past research has indicated that signs are not sufficient to influence newspaper recycling, bus ridership, and seat belt usage, simple sign prompts have been effective in getting people to use special trash receptacles, buy returnable bottles, turn off lights, and avoid stealing certain

store items (Geller, Winett, & Everett, 1982; Glenwick & Jason, 1980). Future research might be directed toward determining the conditions that influence compliance and noncompliance to sign prompts.

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