

*REDUCING THE ILLEGAL SALES OF CIGARETTES TO MINORS:
ANALYSIS OF ALTERNATIVE ENFORCEMENT SCHEDULES*

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The majority of adolescent smokers are able to purchase cigarettes even though laws prohibit the sale of cigarettes to minors (Radecki & Zdunich, 1993). The present study focused on merchant licensing, civil penalties, and monitoring of merchant behavior. Several different schedules of enforcement in the city of Chicago were evaluated to determine the optimal schedules to reduce the sale of cigarettes to minors in a major metropolitan area. Schedules of 2, 4, and 6 months were effective in reducing illegal sales, from 86% to 19%, 87% to 34%, and 87% to 42%, respectively. In a control condition, illegal sales remained high (approximately 84%). Cigarette control laws that regularly enforce civil penalties for tobacco sales violations can successfully reduce minors' access to cigarettes.

DESCRIPTORS: adolescents, smoking, community-based interventions, health promotion, multielement design

According to the U.S. Surgeon General, cigarette smoking is the most important health issue of our time and an avoidable cause of death (U.S. Department of Health and Human Services, 1982). It is responsible for one in every four deaths in the U.S. (Ravenholt, 1985), with over 400,000 Americans dying every year from smoking-related diseases (Schultz, 1991). Cigarette smoking is responsible for 85% of all lung cancer deaths, 80% of all chronic obstructive pulmonary disease deaths, and 30% of all heart disease deaths (Schultz, 1991), and is the most common form of drug addiction (Stolerman, 1990). The addictive power of nicotine over one's psychological and physical status is demonstrated by the fact that 90% of current smokers who have attempted to quit have failed to do so (Pollin, 1984).

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The Centers for Disease Control in Atlanta have reported that 90% of adults began smoking during their adolescent years (Kirn, 1987). According to Illinois legislation (Sale of Tobacco Act, 1983), a person under 18 years of age (a minor) is prohibited from purchasing "smoking herbs" or "tobacco accessories." However, nicotine addiction is the most common health hazard among children, and approximately 3,000 children become smokers daily in the U.S. (Pierce, Fiore, Novotny, Hatziafreu, & Davis, 1989).

Although Illinois state law sets the legal age to buy cigarettes at 18 years, adolescents regularly purchase cigarettes because this law is not enforced. Several studies have documented minors' ability to purchase cigarettes (Altman, Foster, Rasenick-Douss, & Tye, 1989; DiFranza, Norwood, Garner, & Tye, 1987; Jason, Ji, & Anes, 1992) and smokeless tobacco (Xaverius, Billows, Jason, & King, in press) despite state laws prohibiting such purchases. In a sample of 93 U.S. communities in 37 states, Radecki and Zdunich (1993) found that 77% of merchants sold cigarettes to minors.

Educational programs have been implemented as a preventive measure, but cigarette

sales seem to remain unchanged or rebound after time. In Buffalo, New York, after an educational campaign was implemented to reduce cigarette sales to minors, 77% of stores sampled still sold them ("Reducing Minors' Access," 1990). Biglan *et al.* (1995) found that a program educating merchants reduced illegal cigarette sales, but sales had increased at follow-up (A. Biglan, personal communication, September 26, 1995). An ambitious education and enforcement campaign was launched in Santa Clara, California, to restrict minors' access to tobacco, and cigarette sales to minors were reduced from 76% to 39% (Altman, Rasenick-Douss, Foster, & Tye, 1991). A 1-year follow-up showed that cigarette sales to minors had rebounded to 59% (Altman *et al.*, 1991). A related study showed that even enforcing the state law through the courts proved to be ineffective. Feighery, Altman, and Shaffer (1991) found that the majority of judges who conducted cigarette violation hearings either suspended merchants' sentences or waived the fines.

Jason, Ji, Anes, and Birkhead (1991) collaborated in designing an enforcement program with police and politicians in Woodridge, Illinois. During the enforcement condition, minors went into the stores on a regular basis, and police gave tickets to those merchants who sold cigarettes (Jason *et al.*, 1991). After enforcement began, cigarette sales in Woodridge decreased from a baseline of 70% before the ordinance to less than 5% afterwards. Follow-up data with older minors confirmed the effectiveness of this enforcement strategy (Jason, Billows, Schnopp-Wyatt, & King, 1996).

The results of the Woodridge study are of importance in light of federal legislation that requires states to reduce the number of illegal cigarette sales to minors. In 1992, Mike Synar, a democrat from Oklahoma, proposed an amendment to the alcohol and drug abuse appropriations bill requiring states to reduce youth access to tobacco. In 1996, the U.S. Department of Health and Human Services

finalized and published the Substance Abuse and Mental Health Services Administration regulation implementing the Synar Amendment. The key requirements of the regulation require states (a) to adopt laws that prohibit the sale of tobacco to any individual under the age of 18; (b) to enforce such laws in a manner that can reasonably be expected to reduce the extent to which tobacco products are available to minors; (c) to conduct annual, random, unannounced inspections to ensure compliance with the law; (d) to develop a strategy and time frame for reducing illegal cigarette sales to less than 20%; and (e) to submit an annual report detailing efforts to enforce the law, which describes how inspections were conducted, the methods of identifying tobacco outlets, and the overall success in the previous year to reduce minors' access to tobacco. In addition, the report must also include plans for enforcing the law in the coming year. The Synar Amendment also requires the federal government to deduct 10% of substance abuse funds from states that do not comply with the regulations in the 1st year, 20% in the 2nd year, 30% in the 3rd year, and 40% for noncompliance in the 4th and all subsequent years.

For state officials to implement the Synar Amendment successfully, there is a need to evaluate specific procedures for most effectively controlling this problem. Communities around the country are presently experimenting with a variety of approaches, and several communities have documented success with active enforcement (DiFranza, 1992a; Jason *et al.*, 1991).

The new federal law requires random, unannounced inspections, but it is unclear how frequently compliance inspections need to be made. DiFranza (1992b) reported anecdotal information that in one community, when the frequency of inspections fell from every 2 months to every 6 months, compliance also fell. In Bolingbrook, Illinois, quarterly compliance checks had successfully lowered illegal cigarette sales to 18%; however, after a

6-month lapse in police enforcement, the number of sales nearly doubled to 35% (Ra-decki & Strohl, 1991).

The present study evaluated the effectiveness of several comprehensive enforcement schedules in reducing the illegal sales of cigarettes to minors in a large metropolitan area. It was hypothesized that more frequent enforcement would lead to lower illegal sales of cigarettes to minors.

METHOD

Subjects and Setting

In 1992, the City Council of Chicago passed comprehensive legislation restricting minors' access to tobacco. The new law required all merchants to purchase a tobacco license annually for \$150 from the Department of Revenue. By law, all licensed merchants were prohibited from selling tobacco products to minors and were required to post signs in their stores clearly stating this law. In addition, the new legislation restricted cigarette vending machines to taverns (where minors are not allowed) and required all machines to be directly visible by the owner (Billows, Schnopp-Wyatt, & Jason, 1995). Additional legislation, passed about 1 year later, changed the way in which the offense of selling tobacco products to minors was handled. Rather than being administered through the criminal courts, an offense would now be handled administratively (i.e., the merchant would be given a ticket carrying a \$200 fine that could be paid through the mail). If a ticket was challenged, an administrative hearing could be requested. If the ticket was not paid, or if the person did not pay the fine after an administrative hearing had determined that the person was guilty of selling cigarettes to a minor, then the merchant would not be allowed to renew his or her license to sell tobacco products by the city (license renewal occurred once per year).

Five basic categories of stores were sampled: pharmacies, grocery stores, gas stations, con-

venience stores, and "mom and pop" stores. Of these five types of stores, eight stores from each category were sampled in three ethnic geographic areas in Chicago: Caucasian, Latino, and African-American. We obtained 1990 census data and randomly sampled stores that were licensed to sell tobacco in the wards that had the highest percentages of Caucasians, Latinos, and African-Americans. Thus, the sample of stores obtained for the present study contained an equal distribution of the five types of stores among the three ethnic areas.

Experimental Conditions

Before random assignment, 40 stores in each of the three ethnic areas were identified. Each of these three samples of 40 stores were then randomly assigned to one of four different schedules of enforcement. Thirty stores were enforced every 2 months, 30 stores were enforced every 4 months, 30 stores were enforced every 6 months, and 30 stores were assigned to a control condition in which no enforcement occurred. Each of these conditions contained 10 stores from each of the three ethnic geographic areas such that each area was represented equally in all four schedules of enforcement.¹

¹ During the baseline period, seven stores were lost (i.e., went out of business) across the four conditions. Two stores were lost from the 2-month condition: one from the Latino area and one from the African-American area. Three stores were lost from the 4-month condition: one from the Latino area and two from the African-American area. One store was lost from the 6-month condition from the Latino area, and one store was lost from the control condition from the African-American area.

At the end of the study, there still was a balance in the stores assigned to the four conditions. In the 2-month condition, there were 10, six, and eight stores in the Caucasian, Latino, and African-American areas. In the 4-month condition, there were nine, eight, and six stores in the Caucasian, Latino, and African-American areas. In the 6-month condition, there were nine, seven, and nine stores in the Caucasian, Latino, and African-American areas. In the control condition there were 10, eight, and nine stores in the Caucasian, Latino, and African-American areas.

Observation Procedures

Purchase rates were measured by sending minors into stores to purchase cigarettes. Minors were recruited from a variety of sources, including schools, social service agencies, and friends of the investigators. Before participating in the study, minors and their parents received an explanation of the nature of the experiment and the benefits and risks of participation, and minors were required to sign a consent form. Minors were not used for compliance checks in the neighborhoods in which they lived. Minors were used for only one sampling to ensure that merchants did not associate them with the study, an issue that was particularly important during the intervention phase. Two adults independently judged the appearance of all minors to be between the ages of 16 to 17 years. Adolescents judged to be younger than 15 years or older than 18 years were not used in the study. We recruited male and female Caucasian, African-American, and Latino minors. All minors were trained prior to data collection. Training involved role-playing exercises in which mock purchase attempts were practiced with a member of the research team to prepare minors for actual purchase attempts. Minors were also given a detailed description of the study.

Purchase attempts and compliance checks involved sending a minor into a store to buy a pack of Marlboro Light® or Camel Light® cigarettes. If the salesperson asked for age identification, the minor told the merchant that he or she did not have identification. If the salesperson asked his or her age, the minor stated his or her actual age. An adult (research assistant) waited outside the store while the purchase attempt was made. After the minor had safely returned to the automobile, the adult recorded whether a purchase had occurred; the time, date, name of the store; and the age, gender, and ethnicity of the minor making the purchase attempt.

In addition, the adult recorded the presence of a sign visible to the public indicating that, by law, merchants are prohibited from selling all tobacco products to minors. The minor was also asked whether the merchant had requested identification or a statement of age.

Enforcement Procedures

Baseline data collection began in December 1993. A warning condition was implemented after collecting data in April 1994. After the minor left the store during the April 1994 assessment, all merchants who sold cigarettes to minors were issued warnings. Warnings were given out by a member of the DePaul University research team who had been waiting unobtrusively outside the store in a parked automobile. Warnings consisted of a copy of the new law, a sign regarding this law to be posted in stores, and a tip sheet for training employees about state tobacco laws. Merchants were also briefly informed that the Department of Revenue of the City of Chicago was beginning a program of unannounced inspections to deal with the problem of illegal tobacco sales to minors. Merchants who did not sell cigarettes to a minor were given a congratulatory note and a copy of the materials that were given to merchants who received warnings.

The intervention (enforcement) phase was implemented following the May 1994 assessment for stores in the 2-, 4-, and 6-month conditions. A ticket, carrying a fine of \$200 from the Department of Revenue, was issued to any merchant who sold cigarettes to a minor during a compliance check or who did not have a sign posted. Violations of the law were treated as a civil offense. Merchants could either pay the ticket, which was issued at the time of the illegal sale, or request an administrative hearing within the Department of Revenue. Subsequent offenses resulted in additional fines of

\$200 and the possibility of license suspension.

Data were then collected on a monthly basis for a 12-month period during the intervention (May 1994 to April 1995). During those months in which particular stores were not scheduled for enforcement, unenforced compliance testing was conducted to obtain monthly longitudinal data on purchase rates.

Interrater Agreement

Thirty interrater reliability checks were made independently by two members of the research team. For each category, agreements among raters were divided by agreements plus disagreements. Findings demonstrated 100% agreement for merchant gender, merchant ethnicity, minor ethnicity, minor gender, store type (pharmacies, grocery stores, gas stations, convenience stores, or mom and pop stores), and for the presence of a sign stating the legal age to purchase cigarettes. Because of the difficulty in differentiating minors who looked 16 rather than 17, we decided to rate minors on whether they looked older than 15 and younger than 18. Two judges independently rated all minors on this dimension with interrater agreement of 100%.

We did not have adults observe all purchase attempts, because we believed that their presence might bias the results. A salesperson might be less likely to sell cigarettes to a minor with an adult watching the interaction. We therefore observed purchase attempts on only 12 occasions in large stores in which adult members of the research team could remain inconspicuous (supermarkets, pharmacies, and convenience stores). Reliability was calculated by dividing agreements between the primary and secondary observers by agreements plus disagreements. Interrater agreement on whether a sale occurred was 100%. On those occasions in which a second observer did not enter the store to

confirm whether a sale had been made, a member of the research team counted the money that the minor had been given to purchase the cigarettes. Reliability was determined by dividing agreements by agreements plus disagreements. Using this system, there was 100% agreement on whether a purchase had occurred.

On 12 occasions, an independent observer noted whether merchants requested identification or statement of age. Reliability was determined by dividing agreements by agreements plus disagreements. Interrater agreement was 100%. For those occasions in which adults did not directly observe purchase attempts, minors were asked when they returned to the automobile whether the salesperson had requested a statement of age or identification.

RESULTS

Monthly cigarette sales data collected before and during intervention are shown in Figure 1. A month of intervention involved making compliance checks at each of the stores in the 2-month, 4-month, 6-month, and control conditions. Average cigarette sales for the 5-month baseline period from December 1993 to April 1994 were as follows: 89% for control stores ($n = 29$ stores), 86% for stores in the 2-month condition ($n = 28$ stores), 87% for stores in the 4-month condition ($n = 27$ stores), and 87% for stores in the 6-month condition ($n = 29$ stores).

At the end of the April 1994 observation, warnings were issued to all merchants who had sold cigarettes to minors that month during the final collection of baseline data. During the May 1994 observation, for stores in the 2-month condition, sales decreased to 71% ($n = 28$ stores), in the 4-month condition, cigarette sales decreased to 64% ($n = 25$ stores), and in the 6-month condition, sales decreased to 69% ($n = 29$ stores). Fi-

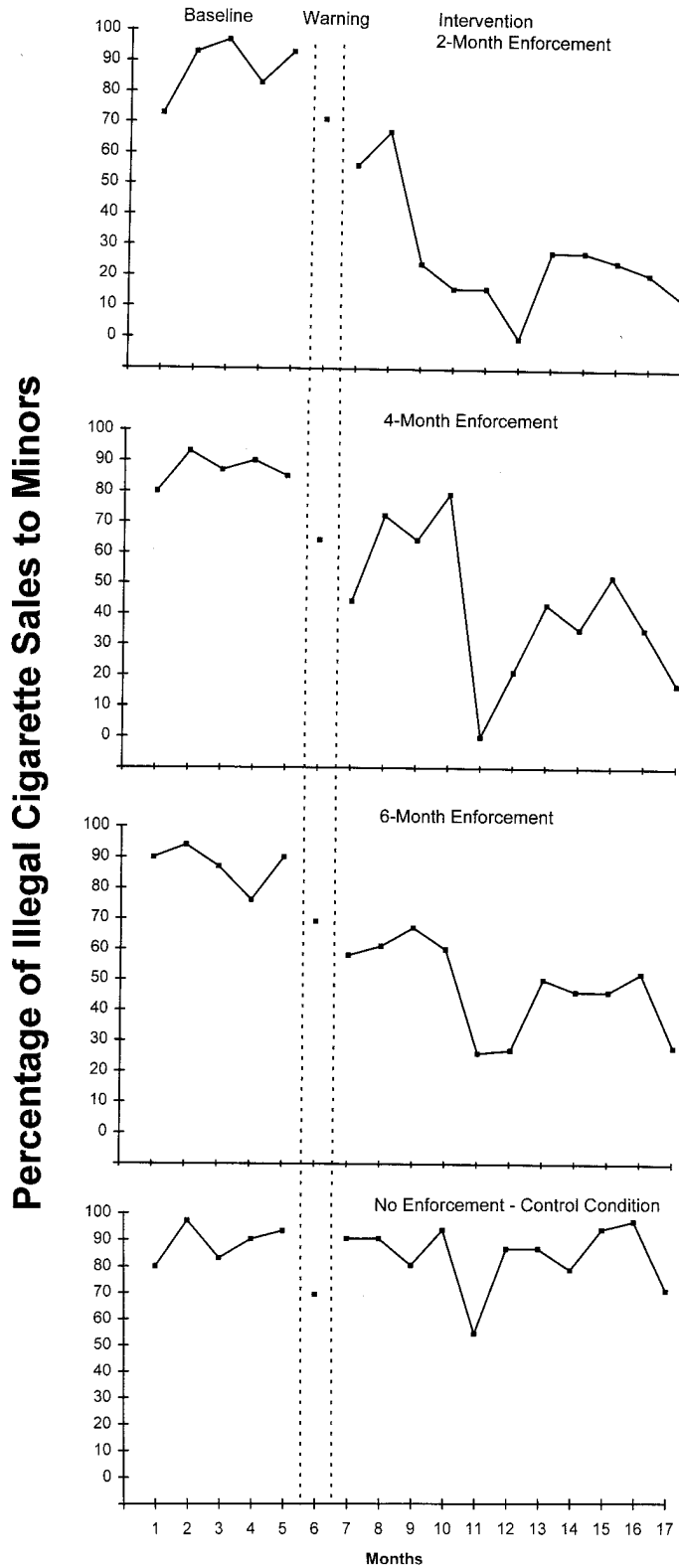


Figure 1. Percentage of illegal cigarette sales to minors during the baseline, warning, and intervention phases.

nally, in the control condition, cigarette sales decreased to 69% ($n = 29$ stores) in May 1994 after the warning.

During the intervention phase, which began after observational data were collected in May 1994, illegal sales dropped considerably in all three enforcement conditions but remained high in the control condition (Figure 1). For stores in the 2-month condition, illegal cigarette sales decreased sharply during the enforcement phase, with an average sales rate of 19% ($n = 24$ stores) for the last 6 months of the intervention. For stores in the 4-month condition, for the final 6 months of the intervention, cigarette sales dropped to an average of 34% ($n = 23$ stores). Cigarette sales by stores in the 6-month condition decreased to an average of 42% ($n = 25$ stores) over the last 6 months of the intervention.

Number of Tickets and Administrative Hearings

From May 1994 to April 1995, a total of 120 tickets were issued to 76 stores for selling cigarettes to minors. Forty-two stores received one ticket, 26 stores received two tickets, six stores received three tickets, and two stores received four tickets. A total of 28 administrative hearings to protest tickets were held. In 2 of these hearings, merchants were not found to be liable and their fines were dropped. Of the 118 violations that were required to be paid, 110 fines were paid. The eight stores that did not pay their tickets were not able to renew their licenses to sell tobacco products in the city of Chicago. We expect that many of these store owners will pay the fines when they need to renew their licenses, but these data are not available. Eleven stores were also given tickets for failing to post a sign stating that the sales of tobacco to persons under 18 years of age is unlawful. All 11 of these tickets were paid.

Cost-Benefit Analysis

The costs for the enforcement procedure included payments to minors involved in data collection, cigarette purchases, time for a research assistant to supervise the minors, transportation costs, and time for the officials who dispensed tickets from the Department of Revenue and for the administrative officers who conducted the hearings. Costs were tabulated for only those months in which enforcement occurred. (Six, 3, and 2 months of enforcement data were used in the tabulations for the 2-month, 4-month, and 6-month conditions.) Total costs associated with the 2-month, 4-month, and 6-month enforcements were \$2,396, \$1,524, and \$1,355, respectively.

The economic benefits in terms of fines received by the courts and licensing fees to sell tobacco products were \$16,100, \$13,100, and \$10,100 for the 2-month, 4-month, and 6-month interventions, respectively. (These benefits do not, however, take into account that the more frequent schedules of enforcement led to lower sales to minors.) Therefore, the cost-benefit ratios for the 2-month, 4-month, and 6-month conditions were \$2,396/\$16,100 (14.9%), \$1,524/\$13,100 (11.6%), and \$1,355/\$10,100 (13.4%), respectively.

Secondary Analyses

Cigarette sales were analyzed according to ethnic areas to determine the extent to which illegal cigarette sales differed among Latino, African-American, and Caucasian areas in Chicago. We compared data collected during the 1st month of baseline to data obtained from the last month of intervention. Because the same stores were sampled each month, we did not collapse data across phases. Only data from stores in the 2-, 4-, and 6-month conditions were analyzed to evaluate the effects on stores in the baseline condition compared with

stores exposed to an intervention. Results of chi-square analyses revealed no significant differences in cigarette sales to minors across Latino, African-American, and Caucasian neighborhoods during the 1st month of baseline or the last month of intervention. Thus, the ethnicity of a neighborhood was not a factor that influenced cigarette sales to minors.

The posting of warning signs stating the legal age to purchase cigarettes was also analyzed to determine if cigarette sales were affected by the presence of such signs. Cigarette sales during the 1st month of baseline and the last month of intervention were not significantly related to warning signs. These findings indicate that the posting of warning signs was not associated with decreases in the number of illegal sales of cigarettes to minors.

Illegal cigarette sales were significantly affected by requests for age identification during the first month of baseline, $\chi^2(1, N = 90) = 20.63, p < .001$. Of the merchants who asked for age identification, cigarettes were sold to minors only 33% of the time, whereas cigarettes were sold 89% of the time by merchants who did not ask for age identification. Cigarette sales for the last month of intervention were also significantly influenced by requests for age identification, $\chi^2(1, N = 72) = 72, p < .001$. Cigarette sales were zero when merchants asked for age identification; however, when merchants did not request proof of legal age, cigarettes were sold illegally 100% of the time. These results demonstrated that although cigarette sales were significantly lower when requests for identification of age were made, optimal results were obtained after a period of compliance checks and enforcement.

Another analysis involved the extent to which the different types of stores sold cigarettes to minors during the 1st month of baseline and during the last month of the intervention. There was a significant differ-

ence during baseline, with 100% ($n = 18$) of gas stations, 94% ($n = 18$) of convenience stores, 78% ($n = 18$) of grocery stores, 72% ($n = 18$) of mom and pop stores, and 61% ($n = 18$) of pharmacies selling cigarettes, $\chi^2(4, N = 90) = 12.03, p < .01$. During the last month of intervention, significant differences were no longer obtained among different types of stores with 20% ($n = 15$) of gas stations, 14% ($n = 14$) of convenience stores, 27% ($n = 15$) of grocery stores, 8% ($n = 13$) of mom and pop stores, and 27% ($n = 15$) of pharmacies selling cigarettes to minors.

To compare the frequency of illegal cigarette sales to male and female minors, we used chi-square analyses to compare 2 months of data collected during baseline and 2 months of data collected during intervention. It was necessary to use 2 months of data per phase for comparison purposes because during each month, only a male or a female minor attempted to purchase cigarettes. During baseline, illegal cigarette sales were significantly higher to female minors than to male minors: 99% versus 83%, $\chi^2(1, N = 154) = 30.86, p < .001$; McNemar change test. During the intervention phase, however, there were no differences in cigarette sales based on gender.

The final analyses involved the extent to which the ethnicity of the minor influenced cigarette sales. Using the Cochran Q test for related samples, we compared the frequency at which cigarettes were sold illegally to an African-American minor, a Latino minor, and a Caucasian minor during 3 months of baseline and 3 months of intervention. Because there were minors of three different ethnicities, with 1 being used each month, it was necessary to use 3 months of data per phase to make the necessary comparisons. We did not find significant differences in sales rates across ethnicity for either baseline or intervention.

DISCUSSION

Prior to the intervention, cigarette sales to minors were remarkably high. On average, minors successfully purchased cigarettes 87% of the time. Illegal cigarette sales were found to drop in response to enforcement, and fewer purchases were observed for stores that were enforced more often. Stores in the 2-month enforcement condition had fewer illegal sales of cigarettes than stores in the 4-month condition, and stores in the 4-month condition had fewer illegal sales of cigarettes than those in the 6-month condition.

Reducing the availability of cigarettes to youth might influence actual use of tobacco products. Unfortunately, this study did not monitor actual cigarette usage by minors. It might be argued that if about one out of every four stores continued to sell cigarettes to minors, cigarettes would still be readily available to youth, and smoking levels might not decrease. This is an empirical question and needs to be explored in future studies. However, DiFranza (1992c), Hinds (1992), and Jason et al. (1991) found a decrease in youth smoking following the implementation of compliance checks and enforcement in various communities.

As more communities adopt the types of enforcement procedures delineated in this study, it is possible that some youngsters who currently smoke will either falsely report their age to purchase cigarettes or steal cigarettes to continue smoking. The extent of this problem is unclear, but as mentioned above, several studies suggest that decreasing the number of merchants who sell cigarettes to minors has led to reductions in usage of this product in youth (DiFranza, 1992c; Hinds, 1992; Jason et al., 1991). From a public health perspective, we believe that it is more important to continue reducing minors' access to cigarettes through compliance checks and enforcement, in spite of the pos-

sibility that some unintended collateral effects might occur (e.g., stealing cigarettes).

The results of the present study support previous research that has demonstrated educational material and merchant education to be ineffective methods of producing long-term reductions in illegal cigarette sales made to minors. Control stores received information concerning the legislation restricting tobacco sales in Chicago and tips for employee training but were never ticketed. In these stores, purchases decreased only temporarily in response to the educational materials we distributed. Two months after warnings were issued, illegal sales had rebounded to 87% and then averaged 84% during the final 6 months of the study. In addition, the posting of signs stating the legal age to purchase cigarettes was not found to be related to the occurrence of cigarette sales to minors. Although educational and informational methods serve to increase awareness, illegal cigarette sales appear to remain high because there are no aversive consequences for merchants if they continue to sell cigarettes to minors. It is probably far more profitable for merchants to continue to sell cigarettes illegally to minors than to comply with the law voluntarily.

Similarly, cigarette sales dropped sharply in Month 11, apparently in response to the considerable amount of publicity and media attention our study received during this particular month. Several television news programs featured our study and provided their viewers with an actual episode of a minor successfully purchasing cigarettes. In addition, several newspaper reporters wrote stories about youth access to cigarettes and discussed our study. However, sales began to rebound sharply, possibly because merchants assumed that their own stores would not be monitored and that they could sell cigarettes to minors without penalty. Yet, as the study progressed, merchants soon realized that the consequences of selling cigarettes to minors

were real. Our results indicated that the key to reductions in cigarette sales to minors was active enforcement of tobacco legislation. In other words, the media can bring about short-term reductions in illegal sales of cigarettes, but more enduring changes require regular enforcement. We do believe, however, that education and positive reinforcement are useful initial steps that might be used in conjunction with enforcement campaigns, particularly to alert merchants to the extent of the problem and the nature of the enforcement campaign.

In addition to investigating the optimal frequency at which stores should receive the enforcement intervention, we also examined the relationship between a number of variables and illegal cigarette sales. The posting of warning signs, the ethnic area, and the ethnicity of the minor were not significantly related to cigarette sales. However, illegal cigarette sales were significantly related to the gender of the minor, to the type of store, and to requests for age identification.

During the baseline phase, we found that cigarettes were sold significantly more frequently to females than to males. These findings are consistent with the results of previous studies that examined the influence of gender on illegal cigarette sales (Landrine, Klonoff, & Fritz, 1994).

Prior to intervention, the frequency of illegal cigarette sales differed significantly by the type of store, with gas stations and convenience stores selling cigarettes most frequently. After the enforcement conditions were initiated, however, significant differences in purchase rates among different store types were no longer present. These findings are encouraging because they demonstrate the success of the enforcement conditions in lowering illegal cigarette sales across a range of store types.

We also found that requests for identification were related to significantly lower purchase rates during both the 1st month of

the baseline phase and the last month of the intervention phase. It is interesting to note that before intervention, 33% of clerks who asked for age identification still sold cigarettes to minors. This finding suggests that simply requiring merchants to request age identification during all cigarette sales does not lower illegal cigarette sales to minors. We found that after intervention, cigarette sales were reduced to zero when merchants requested identification. President Clinton has recently requested the FDA to require merchants to request age identification before selling cigarettes; however, this study suggests that many merchants will continue selling cigarettes unless enforcement programs are combined with identification requests.

Many communities currently use mock purchases of cigarettes (in which the cigarettes are requested but not actually purchased) during enforcement. The finding that many merchants still sell cigarettes after requesting age identification suggests that mock purchases might not accurately assess illegal sales of cigarettes to minors.

Under the Synar Amendment, every state is required to enforce tobacco sales laws in a manner that can reasonably be expected to reduce the extent to which tobacco products are available to underage youths. States will be required to report their efforts annually. However, the Synar Amendment does not stipulate what schedule of enforcement communities should use. Results of this study suggest that an enforcement schedule that occurs at least every 4 months would be an effective schedule for bringing about considerable reductions in the illegal sales of cigarettes to minors.

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STUDY QUESTIONS

1. What is the Synar Amendment and what is the significance of this study to its provisions?
2. Briefly describe the general experimental context the authors created so that they could monitor tobacco sales.

3. What was the primary dependent variable, and what additional data were collected? Also, how was interobserver agreement assessed for the primary dependent variable?
4. The first experimental condition consisted of a warning. Why was this condition implemented, what did it entail, and what were its effects on illegal cigarette sales?
5. Describe the intervention procedure and the experimental design that was used to evaluate its effects. What alternative designs might have been used?
6. What results were obtained during the enforcement conditions?
7. In addition to examining the effects of enforcement, the authors attempted to determine if other variables might affect illegal sales. What were these variables, and did any of them exert influence on the results obtained?
8. The cost-benefit analysis included by the authors provided useful information for those considering the feasibility of program implementation. Describe how, from a different perspective, the primary results obtained in the study might also be explained by a cost-benefit interpretation.

Questions prepared by SungWoo Kahng and Michele Wallace