UTILIZATION AND IMPACT OF CIGARETTE PACK COVERS ILLUSTRATED WITH ANTISMOKING MESSAGES

DEREK CHRISTIE
JEAN-FRANÇOIS ETTER
University of Geneva

The authors tested whether smokers would use cigarette pack covers illustrated with antismoking messages. In 2001, visitors to a smoking cessation Web site ordered cigarette pack covers and answered a follow-up questionnaire 52 days later. Participants received by mail cardboard boxes designed to contain cigarette packs and illustrated with antismoking messages. Participants were 393 smokers living in France, Belgium, and Switzerland. Participants used their boxes for 21 days out of a possible 28 days, and 31% were still using them at follow-up. Almost one third (32%) said that the boxes often *prompted discussions about smoking. The boxes that were submitted to pretests were preferred to the boxes that were not pretested. The authors concluded that the boxes were welcomed by smokers and enabled the display of antismoking messages for 3 weeks in their immediate environments. The intervention had no impact on smoking cessation, but this was not its primary objective.*

Keywords: *smoking; prevention; control; Internet*

AUTHORS' NOTE: This study was supported by grants from the Swiss National Science Foundation to J.-F. Etter (3233-054994.98 and 3200-055141.98) and by a grant from the Geneva Health Administration (Direction Générale de la Santé, Département de l'Action Sociale et de la Santé) to Centre d'Information et de Prévention du Tabagisme (CIPRET). Vincent Baujard of the Health on the Net Foundation (http://www.hon.ch) developed the software for data collection. The authors thank Evelyne Laszlo for her help in data collection and Jean-Charles Rielle (the director of CIPRET) for his collaboration. Correspondence concerning this article should be addressed to Jean-François Etter, Institute of Social and Preventive Medicine, University of Geneva, CMU, Case Postale, CH-1211 Geneva 4, Switzerland; e-mail: jean-francois.etter@imsp.unige.ch.

EVALUATION & THE HEALTH PROFESSIONS, Vol. 27 No. 2, June 2004 107-118
DOI: 10.1177/0163278704264050

As opportunities for tobacco advertising are increasingly curtailed, the cigarette pack itself has become an important vehicle for the promotion of cigarettes. This is confirmed by the long-standing opposition of the tobacco industry to plain or generic packaging and to large and graphic health warnings on cigarette packs (Beede & Lawson, 1992; Cunningham & Kyle, 1995; Martens, 2002; Strahan et al., 2002). Indeed, some cigarette companies have considered modifying their logos in attempts to attract extra attention to their cigarette packs (Wakefield & Letcher, 2002).

Using cigarette packs to display prevention messages has the double objective of making exposure to the information frequent and linked to the act of smoking. Thus, many countries have imposed prevention messages on cigarette packs by law (Aftab, Kolben, & Lurie, 1999). A successful example is Canada, where commercially available packs display large pictures of tumors and other diseases induced by smoking (Martens, 2002). Such packaging has been effective in raising concern about the health effects of smoking and has motivated some people to stop smoking (Canadian Cancer Society, 2002).

In the European Union (EU), the size of health warnings was recently increased to ≥30% of cigarette pack surfaces, and member states may now decide whether these warnings will include photographs (as outlined in EU Tobacco Products Directive 2001/37/EC). In 2001, when the present study was carried out, surfaces devoted to prevention messages on cigarette packs sold in France, Switzerland, and Belgium were devoid of illustrations and were far less imaginative and colorful than the rest of the packs (e.g., Confoederatio Helvetica, 1998).

In countries where there are no laws requiring large health messages with photographs on cigarette packs, such messages can nevertheless be displayed by giving smokers pack covers (boxes) carrying appropriate text and illustrations. Pack covers have the additional objectives of concealing the industry's logos and smoker-friendly designs (Wakefield & Letcher, 2002; Wakefield, Morley, Horan, & Cummings, 2002) and offering an opportunity to display information on telephone quitting lines, Web sites, and smoking cessation clinics. However, it is not known whether smokers are willing to use cigarette pack covers carrying antismoking information. The aims of this study were to test whether smokers were prepared to use such covers and

whether these covers had an impact on smoking-related attitudes and behaviors.

METHODS AND MATERIALS

PARTICIPANTS

We posted an invitation to take part in the study on a French-language smoking cessation Web site (http://www.stop-tabac.ch) from October 8 to 19, 2001 (Etter & Perneger, 2001b, 2001c). The Web site was visited by 6,200 people during these 12 days. Smokers who visited the Web site and were interested in taking part in the study answered a questionnaire and indicated their names and mail and e-mail addresses. They committed themselves to using the boxes and to taking part in the follow-up survey. Participants chose the boxes they preferred on the basis of photographs of four boxes, each carrying a different prevention message. Boxes were sent at no charge.

INTERVENTION

The boxes, designed to hold standard 20-cigarette packs, were made out of cardboard and had pouches on one side holding lighters, which were also supplied. A local state-supported smoking prevention center (http://www.cipret.ch) designed four different smoking prevention messages to illustrate the boxes. Two of these illustrations—an array of syringes reflecting the addictive nature of tobacco (hereafter "syringe") and a young boy's face behind his mother's lighted cigarette with the comment "Passive smoking: Kevin, 2 years old, a smoker" (hereafter "Kevin")—came out on top for perceived impact and subjective preference during an Internet-based pretest of 13 different illustrations, conducted among 326 smokers and ex-smokers on the same Web site. The two other pictures were an illustration designed to mean "I kiss nonsmokers"—in fact a red lipstick print of a mouth preceded by "I" and followed by "nonsmokers" (hereafter "lipstick")—and a patchwork of various prevention messages (e.g., "Smoking causes lung cancer," "Smoking causes chronic bronchitis," "Smoking causes impotence," "Smoking gives bad breath," etc.,

hereafter "patchwork"). The boxes also displayed the addresses of two smoking cessation Web sites and one information center, as well as telephone and fax numbers at which help and information could be obtained. We sent the boxes by mail to participants 3 weeks after the baseline survey, at no charge. One month after receiving the boxes, participants received by e-mail an invitation to answer the follow-up survey online. Nonrespondents received up to four reminder e-mails.

MAIN OUTCOME MEASURES

We assessed whether participants used the boxes at all, for how long they used them, and whether they were still using them at follow-up. We also asked participants, "Did the box encourage you to talk about smoking with other people?" "Did you show the box to other smokers?" "Did the box motivate you to quit smoking?" and "Over the past 4 weeks, have you discussed smoking with other people?" Two open-ended questions covered the positive and negative aspects of the boxes.

Questions also covered smoking status (daily, occasional, or ex-smoker), the number of cigarettes smoked per day, 24-hour quitting attempts during the previous 4 weeks, and the intention to quit smoking (on a scale ranging from 0 to 10). Other items, answered on 5-point, Likert-type scales with response options ranging from *strongly disagree* to *strongly agree*, were "Smoking is extremely dangerous for my health," "My secondhand smoke is dangerous for others," "Smoking gives me bad breath," "Information on the dangers of smoking gives me something to think about," and "Cigarettes are highly addictive" (Etter, Humair, Bergman, & Perneger, 2000).

We asked participants in the follow-up survey if they were the same people who had answered at baseline, and we checked names, ages, and sex to make sure that this was the case. The baseline questionnaire, with a picture of the boxes, is available at http://www.stop-tabac.ch/fr/boxes2.html, and the follow-up questionnaire is available at http://www.stop-tabac.ch/fr/suivi_bbox.html.

STATISTICAL ANALYSIS

We used chi-square tests to compare groups on categorical variables, *t* tests to compare groups on continuous variables, and analysis

of variance models when more than two groups were compared on continuous variables. We used McNemar tests to assess before-after changes within groups on dichotomous variables and paired-samples *t* tests to assess before-after change within groups on continuous variables. For each participant, we computed a before-after change score for continuous variables (value at follow-up minus value at baseline), and we used independent-samples *t* tests to compare groups for before-after change. For quitting attempts (a dichotomous variable), we computed a before-after change score for each participant; we set this score at 0 if the same answer had been given at baseline and follow-up, at 1 if a quitting attempt had been made before follow-up but not before baseline, and at –1 if there was a quitting attempt before baseline but not before follow-up. Then, we compared groups on this change score using chi-square tests.

RESULTS

PARTICIPATION

Because we had only a limited supply of boxes at our disposal for this test, we stopped data collection when 600 records were stored, 115 of which were later excluded because of insufficient data ($n = 6$), nonsmokers ($n = 39$), no e-mail or postal address ($n = 28$), no commitment to using a box ($n = 10$) or to answering the follow-up questionnaire ($n = 1$), residence outside Europe ($n = 12$), or several of these criteria ($n = 19$). We sent boxes by surface mail to the remaining 485 participants. In all but 12 cases (2.5%), the boxes carried illustrations that the participants had chosen.

There were 404 records in the follow-up data file, which we narrowed down to 393 (81% of 485) by removing 1 double entry, 6 records with insufficient data, and 4 records for which different people had answered at baseline and follow-up. Follow-up occurred on average 52 days after baseline (quartiles: 48, 50, and 53 days; range 41 to 146 days).

Participants were 34 years old on average, 53% were women, and average school attendance was 15.4 years. Participants lived in France (64%), Switzerland (25%), and Belgium (9%). Almost all were daily

TABLE 1

Answers Before and 1 Month After Smokers Received One of Four Cardboard Boxes Illustrated With Antismoking Messages Into Which They Could Insert Cigarette Packs

	All Participants		*Syringe Group*		*Patchwork Group*		*Kevin Group*		*Lipstick Group*		*Between-*
Item	*Before*	*After*	*Before*	*After*	*Before*	*After*	*Before*	*After*	*Before*	*After*	*Groups* p *Value*[a]
Cigarettes/day (mean)	19.4	18.1**	19.1	19.1[b]	21.2	18.2***	18.0	15.7***	19.5	17.9*	.025
Intention to quit (0 to 10 score, mean)	5.9	5.5***	5.6	5.4[b]	5.8	5.3*	6.0	5.8[b]	6.1	6.1[b]	.57
Smoking is extremely dangerous to my health (*% strongly agree*)	69	64[b]	64	63[b]	73	69[b]	76	66*	60	58[b]	.10
My secondhand smoke is dangerous to others (*% strongly agree*)	30	30[b]	21	19[b]	26	32[b]	36	36[b]	31	28[b]	.75
Smoking gives me very bad breath (*% strongly agree*)	46	47[b]	45	51*	43	50[b]	44	49[b]	54	39*	.023
The information on the danger of smoking gives me something to think about (*% strongly agree*)	28	34[b]	25	39*	31	32[b]	31	38[b]	25	27[b]	.15
Cigarettes cause a strong dependence (*% strongly agree*)	73	71[b]	76	78[b]	76	70[b]	72	69[b]	71	67[b]	.31
Over the past 4 weeks, have you discussed smoking with other people? (*% very often*)	20	20[b]	21	21[b]	18	12[b]	22	23[b]	18	20[b]	.99
Made a quitting attempt in past 4 weeks (% "yes")	27	22[b]	30	15*	23	16[b]	26	25[b]	29	27[b]	.27

NOTE: Change over time within groups was assessed by paired-samples *t* tests for continuous variables and McNemar tests for dichotomous variables.

a. Comparison between groups of participants who received four different boxes: *p* values on between-group differences in before-after change were based on analysis of variance for continuous variables and chi-square tests for dichotomous variables.

b. Nonsignificant ($p > .05$).

*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

smokers, with only 5% occasional (i.e., nondaily) smokers. At baseline, participants smoked on average 19.4 cigarettes per day (Table 1).

BOX SELECTION

The box most frequently ordered by participants was the Kevin box (142 boxes ordered, 36% of total), followed by the syringe box (95 boxes, 24%), the lipstick box (78 boxes, 20%), and the patchwork box (78 boxes, 20%). The Kevin box was most frequently chosen by women (45% of women chose it), whereas the syringe box was most frequently chosen by men (34% of men chose it). The difference between men and women in box preference was statistically significant ($\chi^2 = 21.2$, $p < .001$). Participants who chose the Kevin box were on average younger (31 years) than those who chose the lipstick box (37 years), the patchwork box (36 years), or the syringe box (34 years) ($F = 9.0$, $p < .001$). There was no statistically significant difference between groups of participants who ordered the various boxes regarding cigarette consumption, quitting attempts in the past month, and level of motivation to quit smoking, but at baseline, participants in the syringe and lipstick groups were slightly less likely than the other groups to agree with the statement "Smoking is extremely dangerous for my health" ($\chi^2 = 22.7$, $p = .03$; Table 1).

USE OF THE BOXES

At follow-up, almost all participants (94%) said that they had received usable boxes, only 19 people (4%) had received them so damaged that they were unusable, and 6 people (2%) said that they had not received them. Most participants (75%) stated that they had used the boxes, 19% that they had used only the lighters but not the boxes, and 4% that they had used neither. Some open comments ($n = 16$) indicated that the boxes were too small for some cigarette packs. Participants used the boxes on average for 21 days (quartiles: 10, 20, and 30 days; $SD = 12$ days) out of a possible maximum of 28 days (the median duration between the receipt of the boxes and the follow-up survey). At follow-up, when answering the question "Where is the box today?" 34% said that they were using them, 47% had kept them as souvenirs, 7% had given them to others, and 8% had thrown them

away. There was no statistically significant difference between groups in answers to these three questions.

Almost one third (30%) of the participants answered "yes" to the question "Is the cigarette pack you are using today inside the box?" More participants gave positive answers to this question in the syringe group (41%) than in the lipstick group (25%, $p = .03$) and patchwork group (21%, $p = .006$). More participants in the Kevin group than in the patchwork group (33% vs. 21%, $p = .05$) gave positive answers to this question.

Over half of the participants (57%) *often* showed the boxes to other smokers, 32% *sometimes*, and 9% *never*. Almost one third (32%) said that the boxes *often* prompted discussions about smoking with others, 51% *sometimes*, and 16% *never*. Five percent answered that the boxes encouraged them to quit smoking *a lot*, 25% *somewhat*, 37% *not much*, and 30% *not at all*. There were no statistically significant differences between the four groups in answers to all these questions.

IMPACT

At follow-up, 7% of the participants had quit smoking. Smoking cessation rates were similar between the groups who had received the different boxes. Among participants who continued to smoke, average cigarette consumption fell from 19.4 to 18.1 cigarettes per day between baseline and follow-up (paired-samples *t* test, $p < .001$). Cigarette consumption remained stable in the syringe group, whereas it decreased in the other groups (–0.01 vs. –1.5 cigarettes per day, between-group $p = .037$; Table 1).

Among participants who continued to smoke, motivation to quit smoking decreased between baseline and follow-up (from 5.9 to 5.5 points on a scale ranging from 0 to 10, $p = .001$), but there was no statistically significant between-group difference in before-after change in motivation to quit. In the syringe group, more people made 24-hour quitting attempts during the 4 weeks before the baseline survey than during the 4 weeks before the follow-up survey (30% vs. 15%, McNemar test, $p = .015$), but there was no statistically significant difference between groups in before-after change in quit attempts ($\chi^2 = 2.5$, $p = .27$).

The perception that smoking causes bad breath increased in the syringe group compared with the other groups (+6.3% vs. –0.9%

"strongly agree," $t = 2.4$, $p = .016$) and decreased in the lipstick group compared with the other groups (–15.1% vs. +5.3% "strongly agree," $t = 2.5$, $p = .015$).

Finally, answers to the open-ended questions indicated that most participants appreciated the boxes. The most positive aspects reported by participants were that the boxes stimulated discussions about smoking and reflection about the drawbacks of smoking. The most negative aspects were that the intervention was viewed as paradoxical, mainly because the lighters and lighter pouches made smoking easier.

DISCUSSION

We tested cardboard boxes illustrated with antismoking messages that could be used as covers for cigarette packs. Using the Internet, it was easy to recruit several hundred smokers who were interested in using these boxes. Almost one third of the participants were still using their boxes daily at follow-up and were therefore exposed daily to the prevention messages during 3 weeks on average, out of a maximum possible of 4 weeks. Most participants said that the boxes had prompted them to discuss smoking with other people, and almost all reported having shown the boxes to other smokers. Thus, smokers spontaneously disseminated prevention messages and addresses of places to get help. This intervention was deemed quite acceptable by smokers recruited on a smoking cessation Web site, and these boxes appear to be an adequate and socially acceptable way of bringing antitobacco information into smokers' daily environments.

Cigarette consumption decreased slightly between baseline and follow-up, but contrary to expected, motivation to quit smoking decreased among people who continued to smoke. Only 5% of participants said that using the boxes encouraged them *a lot* to quit smoking, and in before-after analyses, there was no statistically significant change regarding perceptions of the risk of smoking, quitting attempts, and smoking cessation. Thus, globally, these boxes had no impact on smoking behavior. However, the aim of this intervention was not primarily to modify behaviors but to disseminate prevention messages. Indeed, even intensive exposure to antismoking messages usually does not induce any reduction in tobacco consumption (Secker-Walker, Gnich, Platt, & Lancaster, 2002). This intervention

was also aimed at disseminating the addresses of Web sites and of an information center as well as a telephone number at which help and information could be obtained. Because all participants were recruited on the Web site advertised on the box, visits to this Web site could not be used as an outcome variable. The phone number and information center were located in Switzerland, but only a minority of the participants lived in Switzerland, so calls to this phone number and visits to this center could not be used as outcome variables.

It remains to be tested whether these boxes would have more impact if they displayed a short list of smoking cessation tips (McEwen, Preston, & West, 2002) or information on treatment for tobacco dependence (Etter & Perneger, 2001a), if they were included in a comprehensive smoking cessation intervention, or if they carried more aggressive antismoking messages. Unlike health warnings on cigarette packs in Canada (Canadian Cancer Society, 2002; Martens, 2002), the warnings on the boxes tested in the present study had no impact on the perception of the risk of smoking. It is possible that only very aggressive messages, such as those used in Canada, have an effect. But it remains to be tested whether smokers would voluntarily use cigarette pack covers illustrated with messages as aggressive as those used in Canada.

The Kevin and syringe boxes were the most frequently ordered at baseline, and they were also the most frequently used at follow-up. These two illustrations obtained the best ratings in a pretest, whereas the two other boxes (lipstick and patchwork) had not been pretested. This result confirms that smoking prevention messages should be developed with the target audience and pretested before they are launched (Taylor, 1986).

Women preferred the Kevin box, which suggests that the effects of secondhand smoke on children should be emphasized in smoking prevention messages directed at women (Etter, Prokhorov, & Perneger, 2002). Men preferred the box that displayed an array of syringes. The group of participants who chose the syringe box was the only group whose perceptions of the drawbacks of smoking (health risks, bad breath) increased between baseline and follow-up, which suggests that this illustration was effective. Alternatively, the increase in risk awareness in this group could have resulted from regression to the mean, because this group had the lowest perceptions of risk at baseline.

LIMITATIONS OF THIS STUDY

This study was conducted on a self-selected sample of Internet users. Compared with a representative sample of smokers in Geneva, smokers in this study were more motivated to quit smoking (90% vs. 26% intended to quit smoking in the next 6 months) and slightly more dependent on tobacco (19 vs. 17 cigarettes per day) (Etter, Perneger, & Ronchi, 1997). In a previous study, we compared smokers self-recruited on the same Web site with smokers who took part in a mail survey (Etter & Perneger, 2001b). The results of this prior study showed that even though the statistical distributions of smoking-related variables (e.g., proportion of smokers, number of cigarettes per day) were different in the two samples, the strength of associations between smoking-related variables was similar in smokers recruited on the Internet or by mail (e.g., the association between dependence level and the perceived risk of smoking). Thus, the generalizability of the present study is probably limited to results on associations between smoking-related variables (e.g., differences between groups in before-after change in cigarette consumption). Tests of these boxes in representative samples of smokers are warranted.

Future interventions should use provocative messages, such as the syringe illustration, or emotional messages, such as the Kevin illustration. It should be tested whether smokers would use boxes illustrated with pictures of diseases caused by smoking. It should also be tested whether removing the lighter pouches on the sides of the boxes would affect the use of the boxes.

We conclude that the boxes were welcomed by smokers and that they provided an opportunity to display antismoking messages and addresses in smokers' immediate environments during at least 3 weeks. The intervention had no impact on smoking cessation, but this was not its primary objective. This approach may be useful in countries where legislation does not impose large and graphic warnings on cigarette packs.

REFERENCES

Aftab, M., Kolben, D., & Lurie, P. (1999). International cigarette labelling practices. *Tobacco Control*, *8*, 368-372.

Beede, P., & Lawson, R. (1992). The effect of plain packages on the perception of cigarette health warnings. *Public Health*, *106*, 315-322.

Canadian Cancer Society. (2002). *Evaluation of new warnings on cigarette packages*. Toronto: Canadian Cancer Society.

Confoederatio Helvetica. (1998). *Ordonnance sur le tabac et les produits du tabac, Art. 10: Mises en garde générales* (RS 817.06). Available at http://www.admin.ch/ch/f/rs/817_06/a10.html

Cunningham, R., & Kyle, K. (1995). The case for plain packaging. *Tobacco Control*, *4*, 80-86.

Etter, J.-F., Humair, J. P., Bergman, M. M., & Perneger, T. V. (2000). Development and validation of the Attitudes Towards Smoking Scale (ATS-18). *Addiction*, *95*, 613-625.

Etter, J.-F., & Perneger, T. V. (2001a). Attitudes toward nicotine replacement therapy in smokers and ex-smokers in the general public. *Clinical Pharmacology and Therapeutics*, *69*, 175-183.

Etter, J.-F., & Perneger, T. V. (2001b). A comparison of cigarette smokers recruited through the Internet or by mail. *International Journal of Epidemiology*, *30*, 521-525.

Etter, J. F., & Perneger, T. V. (2001c). Effectiveness of a computer-tailored smoking cessation program: A randomized trial. *Archives of Internal Medicine*, *161*, 2596-2601.

Etter, J.-F., Perneger, T. V., & Ronchi, A. (1997). Distributions of smokers by stage: International comparison and association with smoking prevalence. *Preventive Medicine*, *26*, 580-585.

Etter, J.-F., Prokhorov, A. V., & Perneger, T. V. (2002). Gender differences in the psychological determinants of cigarette smoking. *Addiction*, *97*, 733-743.

Martens, D. (2002). Graphic tobacco warnings having desired effect. *Canadian Medical Association Journal*, *166*, 1453.

McEwen, A., Preston, A., & West, R. (2002). Effect of a GP desktop resource on smoking cessation activities of general practitioners. *Addiction*, *97*, 595-597.

Secker-Walker, R. H., Gnich, W., Platt, S., & Lancaster, T. (2002). Community interventions for reducing smoking among adults. *Cochrane Database of Systematic Reviews*, *3*, CD001745.

Strahan, E. J., White, K., Fong, G. T., Fabrigar, L. R., Zanna, M. P., & Cameron, R. (2002). Enhancing the effectiveness of tobacco package warning labels: A social psychological perspective. *Tobacco Control*, *11*, 183-190.

Taylor, S. (Ed.). (1986). *Health psychology.* New York: Random House.

Wakefield, M., & Letcher, T. (2002). My pack is cuter than your pack. *Tobacco Control*, *11*, 154-156.

Wakefield, M., Morley, C., Horan, J. K., & Cummings, K. M. (2002). The cigarette pack as image: New evidence from tobacco industry documents. *Tobacco Control*, *11*(Suppl. 1), I73-I80.