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ABSTRACT This paper reports an investigation on the educational impact of warning labels on cigarette packages on adolescents. Subjects were asked to identify the locations of warning labels on cigarette packages and advertising and to restate the warning label. Results indicated that official warnings may be well known in general terms but poorly known in specific terms. It is suggested that if mass public warning statements about health are educational devices, they should be developed and pretested with care and evaluated before they are widely disseminated. (JD)

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CIGARETTE WARNING LABELS AS EDUCATIONAL DEVICES

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## CIGARETTE WARNING LABELS AS EDUCATIONAL DEVICES

Is the warning statement or label on a product an educational device? To the extent that the purpose and placement of the label is to modify usage or provide information about a product, it can be classified as an educational device with anticipated knowledge gains or behavioral changes. The warning label on cigarette packages and on cigarette advertisements is perhaps the most widely distributed and most visible health warning label in the United States today; yet there appears to have been little effort made to determine whether the public is aware of the wording of the warning label or understands its meaning.

In 1965, the U.S. Congress (PL 89-92) mandated health warnings on all cigarette packages produced for domestic sales. This warning read: "CAUTION: CIGARETTE SMOKING MAY BE HAZARDOUS TO YOUR HEALTH." Since 1970, Section 4 of the Public Health Cigarette Smoking Act (PL 92-222) has required that all cigarette packages for domestic sale carry a stronger warning label: "WARNING: THE SURGEON GENERAL HAS DETERMINED THAT CIGARETTE SMOKING IS DANGEROUS TO YOUR HEALTH." On March 30, 1972, the Federal Trade Commission presented orders and obtained consent from six major domestic cigarette companies requiring that all print cigarette advertising carry the same warning statement that appeared on cigarette packages.

In accordance with the law, each year the Federal Trade Commission submits a report to Congress on the effectiveness of cigarette labeling, current methods of cigarette advertising, and recommendations for legislation (1). Neither these reports nor the limited related literature in technical journals has adequately addressed the issue of what awareness specific audiences, particularly young people, have of the existence of the label and what they understand the label to mean.

Dehl (2) has criticized the current labels as nothing more than a way to limit government regulation of the tobacco industry. Horn (3) notes that people who considered quitting smoking were more likely to accept the warning label on cigarette packages than those who had not. The American Cancer Society surveyed young people ages 13 to 18 and concluded that they were "familiar" with the warning label on cigarette packages (4).

Attempts to assess the effectiveness of the label in changing cigarette sales have been confounded by the introduction and later withdrawal of television anti-smoking advertisements, the subsequent ban on television advertising, the new emphasis on low tar and nicotine cigarettes and the changing social norms concerning women and youth.

This paper describes one aspect of a larger study of adolescent cigarette smoking in a small midwestern community (population 36,000). Specifically, this paper reports an attempt to identify the degree to which adolescents in grades 7, 9 and 11 were aware of the cigarette warning labels who, among adolescents, could identify the locations of the warning labels on cigarette packages and advertisements; how many actually knew the wording of the warning statement; what types of errors were made in restating the warning label and whether there were any consistent errors in young people's recall of the warning statement which were indicative of mis-information.

Respondents were grouped into categories of "smokers" and "non-smokers" on the basis of responses to a question asking them to describe their current smoking behavior. Respondents who indicated they "usually smoked just about every day" or "smoked once in awhile but not every day" were classified "smokers" and those who indicated they "used to smoke but don't smoke now" or "never smoked" were classified as "non-smokers."

### Location of Warning on Packages

Four hundred and nine seventh graders, 214 males, 195 females; 399 ninth graders, 213 males, 187 females; and 409 eleventh graders, 210 males, 199 females, were asked, in multiple choice questions, to indicate the location of the "Surgeon General's Warning" on cigarette packages and on cigarette advertisements. At all grade levels, a greater portion of the smokers could correctly identify the location of the warning statement on the package than non-smokers (Table I), and for both grades 9 and 11, males and females, these differences were statistically significant (9th grade males,  $\chi^2=12.30, <.001$ ; females,  $\chi^2=11.67, <.001$ ; 11th grade males,  $\chi^2=8.59, <.01$ ; females,  $\chi^2=15.19, <.001$ )(5). Smoking, as we would expect, led to greater familiarity with the Surgeon General's Warning.

### Location of Warning on Advertisements

Respondents were asked to identify where the warning statement was usually located on cigarette advertisements: (upper right hand quadrant, upper left hand quadrant, lower right hand quadrant, lower left hand quadrant). Because the actual location of the warning varies greatly, it was difficult to interpret responses. In an attempt to estimate the actual location of the warning label, a random sample of 200 different advertisements from magazines reported to receive a large percentage of their advertising revenue from cigarette advertisements was selected (6). Seventy-five percent of these advertisements carried the warning statement in the lower left hand quadrant, 19 percent carried the warning in the lower right hand quadrant, three percent carried the warning in the upper right hand quadrant and three percent carried it in the upper left hand quadrant. Clearly there appeared to be a preference among cigarette advertisers for the lower left hand quadrant of the advertisements.

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The small number of respondents selecting the upper quadrants meant all sexes and grades had to be treated together to assess statistical differences. The distribution pattern noted from the sampled advertisements was considered the "expected", and the student responses were considered the "observed." Smokers and non-smokers were considered separately and the observed frequencies were compared to the expected by means of the Chi square statistic testing the no difference hypothesis. The no difference hypothesis could not be supported; males,  $\chi^2=218, <.001$ ; females,  $\chi^2=574, <.001$  (Table II). Students' estimates of the location of the warning label in advertisements had little resemblance to the actual distribution as determined by our sampling of advertisements.

Students were familiar enough with the warning statement's location on print advertisements to know that only occasionally did the warnings appear in the upper half of the advertisement but there was no indication that students had noted where the warning statement usually occurred in the lower half of advertisements.

#### Wording of the Warning Statement

The remainder of this paper focuses on students who claimed to know the warning statement by attempting to write it out. Students were asked to write, in full, the wording of the warning which appears on all cigarette packages and on all cigarette advertisements.\* Questionnaire instructions indicated that

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\*The word "WARNING" was not counted as part of the analysis of the statements in this study. Only the words "The Surgeon General Has Determined That Cigarette Smoking is Dangerous to Your Health" were considered the words on the label. Many students, especially younger students, seemed to judge the word WARNING, separated from the rest of the statement by a colon, as an attention getting device and omitted it from their statements.

students could indicate "Don't Know" if they felt they could not write the statement adequately.

Seventy-three percent of the 11th grade, 142 males and 155 females; 67 percent of the 9th grade, 142 males and 125 females; and 47 percent of the 7th grade; 105 males and 87 females, felt they knew the warning label well enough to attempt to write it out. With the exception of the 7th grade boys and girls, more of the smokers than the non-smokers indicated they knew the warning label and attempted to write it (Table III). Only among 11th grade girls, however, was this difference statistically significant ( $\chi^2=4.92, <.05$ ).

#### Writing the Warning Statement Correctly

With the exception of the 7th grade boys and the 9th grade girls, a larger proportion of smokers than non-smokers were able to write the statement correctly (Table IV). Only for the 11th grade girls, however, was this difference statistically significant ( $\chi^2=27.59, <.001$ ). The Chi square analysis was not completed in all cases because the number of cases in some cells were too few.

Despite the fact that the warning statement has been visibly circulated for a long period of time, and despite the fact that smokers in particular have been frequently exposed to the statement on the cigarette package, it is interesting to note that no more than six percent of the total 7th grade group, 16 percent of the 9th grade group, and only 27 percent of the 11th grade group could write the words of the statement correctly. It is true that the words do not have to be identified correctly for the meaning to be understood, but it is logical to assume that there would be greater comprehension of the meaning of the warning if more people knew exactly what the warning said. Also, to better understand the effects of such mass media warnings, it is important to closely examine the public's understanding of these statements. Data presented later in this paper

illustrate discrepancies in individual perceptions of the warning statement's wording and suggest additional questions for research.

These low levels of accurate knowledge of the warning statement stand in contrast to the 1969 findings of the American Cancer Society that 95 percent of teenagers, 13-18 years of age, had seen the warning label on cigarette packages and 34 percent felt the package warning "had affected them" (4).

To gain additional insights into the nature of the errors and misstatements made by students who thought they knew the warning label, we looked at three additional factors: 1) whether or not the students included in their statement four words judged to be "key" to understanding the meaning of the warning, 2) whether there was a tendency to omit words from the warning, and 3) whether there was a tendency to add words to the warning which were, in reality, not there.

#### Key Words

Table V shows that among students who said they knew the warning statement and attempted to write it out, a higher proportion of smokers than non-smokers included in their statements the four words judged to be "key," or critical, to the meaning of the warning messages. The key words were SMOKING--DANGEROUS--YOUR--HEALTH. Seventh grade females were the only exception. The differences noted between the smokers and non-smokers at the 7th and 9th grade levels were not statistically significant. At the 11th grade, the difference between smokers and non-smokers were statistically significant only for girls ( $\chi^2=6.47, <.01$ ).

#### Missing and Extra Words

There was a general tendency for smokers to omit fewer words in their statement of the wording than non-smokers (Table VI). But as in the earlier examples, this relatively consistent difference across groups was only statistically significant for the 11th grade girls ( $\chi^2=25.85, <.001$ ). Conversely, non-smokers

were more likely to add extra words to their writing of the warning statement than were smokers (Table VII). Again, the consistency of these differences between smokers and non-smokers is striking but significant only for 11th grade girls ( $\chi^2=22.90, <.001$ ).

Errors of Interest

To explore different wordings written by the respondents, a count of all words used in the written statements of the warning was conducted (7). With one exception this analysis revealed little of interest. The exception, however, raises a series of questions about mass public communication of health hazards. The two sets of words most often used as synonyms by different respondents were the words "Hazardous" and "Dangerous" and the words "is" and "may be" or "can be."\* The word "hazardous" has not been included in the warning statement since 1970. However, among respondents who indicated they knew the warning statement 52 percent of the 11th graders, 22 percent of the 9th graders and 23 percent of the 7th graders used the word "hazardous" in their reconstruction of the statement. Similarly the words "may be" have not been included in the warning since 1970, yet 34 percent of the 11th graders, 18 percent of the 9th graders and 16 percent of the 7th graders used the words "may be." There was a greater probability that students in higher grades would use words not included in the warning statement since 1970.

The word "dangerous," used in the warning statement since 1970, was used by 33 percent of the 11th graders, 32 percent of the 9th graders, and 29 percent of the 7th graders. The word of choice among the lower grades was "bad," used

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\*Other words judged equal to the words "may be" included can be, could be, could, and may and might.

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by 35 percent of the 7th graders, 28 percent of the 9th graders, and 13 percent of the 11th graders.

On the other hand, "is," the definite term identifying the danger of smoking used in the warning statement since 1970, was selected by 54 percent of the 11th graders, 74 percent of the 9th graders and 73 percent of the 7th graders.

When the words "dangerous" and "hazardous" were examined along with the definite "is" and indefinite "may be," interesting differences were noted. Respondents using the word "dangerous" were more likely to use the word "is" - post 1970 wording - than "may be." For 9th grade boys and 11th grade boys and girls this difference was significant (Table VIII). It appeared that two separate messages were being repeated by students when asked to state the Surgeon General's warning. One message indicated clearly that smoking "may be hazardous," and the other message indicated that smoking "is dangerous." Older students were more likely to select the words used in the warning statement prior to 1970. And, if they selected one of the two pre-1970 words, there was a significant likelihood they would select the other. In other words, pre-1970 wordings were still circulating among older respondents.

This response pattern could possibly be explained if the greater proportion of smokers in the higher grades were selecting the less definite "may be" and the less specific "hazardous" for reasons related to reducing dissonance. It was hypothesized, therefore, that smokers more likely than non-smokers would select the less definite, less specific statement for their warnings ("may be hazardous").

An analysis of the use of the words "hazardous" and "dangerous" by smokers and non-smokers did not support this hypothesis (Table IX). Similarly, there was no significant difference between choice of the definite "is" and the

indefinite "may be" by smokers or non-smokers (Table X). These results suggest that the two messages (pre and post-1970) were circulating among young people independently of their smoking behavior.

The fact that the words "hazardous" and "may be" were used together and were more often the words chosen by the older students suggests that they may have learned the statement from others who originally learned the statement from the pre-1970, possibly in the classical two-step communication pattern, rather than directly from the packet itself. Most of the 11th grade respondents were less than 11 years of age in 1970 and likely not sufficiently familiar with cigarette packages to learn the pre-1970 statement firsthand. If this is a plausible explanation for the higher proportion of pre-1970 messages reproduced by the older students, then the "delay" in learning the new (post-1970) wording suggests real hazards in introducing public health messages that will, at some later time, be changed or strengthened. Successful changes in widely disseminated names and messages have been achieved in the commercial sector, through massive public information campaigns such as those conducted by Standard Oil (to Exxon) and Bank Americard (to Visa). Without similar expensive and sophisticated efforts, updating the public perceptions of warning statements may prove to be a more difficult task than receiving wide acceptance of such warning when they are first introduced. Changing a message, in other words, may be more difficult than the original introduction of the message.

Summary and Implications

Despite wide knowledge of the existence of the Surgeon General's Warning on cigarette packages and on cigarette advertisements, fewer than 27 percent of 7th, 9th and 11th graders can state the warning correctly. In general, smokers were more familiar with the label and its wording than were non-smokers but differences between the two groups were only rarely statistically significant.



The greatest consistent difference between smokers and non-smokers occurred among the girls in the 11th grade. In the high school year, girls are generally recognized as better students than boys. This, coupled with previous findings that there is a greater social and academic distance between smokers and non-smokers in the teenage years (8, 9, 10), may explain the marked differences in knowledge of the Surgeon General's Warning among the older girls.

From an educational perspective, it does not appear that the government's warning has been incorporated into anti-smoking education efforts, if indeed the schools have done anything about anti-smoking education.

This paper suggests that "official" warnings may be well known in general terms but poorly known in specific terms. When the specific terms of a warning are learned they appear to retard the likelihood of learning new or revised warnings.

Mass public warnings which are not targeted at specific audiences run a considerable risk of being poorly known. If such public warnings are also poorly developed and need to be changed at a later date, there appears to be a considerable lag in getting revised meanings accepted by people who learned earlier warnings.

If mass public warning statements about health are educational devices, they should be developed and pre-tested with appropriate care and evaluated before they are widely disseminated.

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Table I

IDENTIFICATION OF LOCATION OF  
THE WARNING ON PACKAGE

	MALES			FEMALES		
	N	Right %	Wrong %	N	Right %	Wrong %
<u>7th</u>						
Sm	23	61	39	35	51	49
NSm	191	38	62	160	34	66
	$(\chi^2=3.67, \text{N.S.})$			$(\chi^2=3.13, \text{N.S.})$		
<u>9th</u>						
Sm	43	83	17	49	84	16
NSm	170	48	41	137	55	45
	$(\chi^2=12.30, <.001)$			$(\chi^2=11.67, <.001)$		
<u>11th</u>						
Sm	49	90	10	54	91	9
NSm	161	67	33	145	61	39
	$(\chi^2=8.59, <.01)$			$(\chi^2=15.19, <.001)$		

Table II

LOCATION OF SG's WARNING  
ON CIGARETTE ADVERTISEMENTS

SMOKERS

			N
Observed	8.00	12.00	20.00
Expected	5.76	5.76	11.52
Observed	59.00	113.00	172.00
Expected	144.00	36.48	180.48

( $\chi^2=218.31, <.001$ )

NON-SMOKERS

			N
Observed	24.00	31.00	55.00
Expected	18.84	18.84	37.68
Observed	231.00	342.00	573.00
Expected	471.00	119.32	590.32

( $\chi^2=547.12, <.001$ )

Table III

STUDENTS INDICATING THEY  
KNEW THE SG's WARNING

	MALES			FEMALES		
	N	Know %	DK %	N	Know %	DK %
<u>7th</u>						
Sm	23	30	60	35	40	60
NSm	191	51	49	160	46	54
	$(\chi^2=2.79, N.S.)$			$(\chi^2=.18, N.S.)$		
<u>9th</u>						
Sm	46	74	26	39	87	13
NSm	167	65	35	86	80	20
	$(\chi^2=.91, N.S.)$			$(\chi^2=1.0, N.S.)$		
<u>11th</u>						
Sm	37	84	16	48	77	23
NSm	105	69	31	107	59	41
	$(\chi^2=3.18, N.S.)$			$(\chi^2=4.92, < .05)$		

Table IV

STUDENTS WHO STATED THE  
SG's WARNING CORRECTLY

	MALES			FEMALES		
	N	Know %	DK %	N	Know %	DK %
<u>7th</u>						
Sm	7	14	86	14	7	93
NSm	98	20	80	73	4	96
<u>9th</u>						
Sm	34	29	71	38	18	82
NSm	108	25	75	88	19	81
<u>11th</u>						
Sm	38	53	47	50	60	40
NSm	109	37	63	114	17	83

( $\chi^2=.08$ , N.S.) ( $\chi^2=.02$ , N.S.)

( $\chi^2=2.34$ , N.S.) ( $\chi^2=27.59$ , < .001)

\*Data do not meet requirements for Chi square analysis.

Table V

KEY WORDS INCLUDED BY STUDENTS  
WHO KNEW SG'S WARNING

	MALES			FEMALES		
	N	%	<4%	N	%	<4%
<u>7th</u>						
Sm	7	86	14	14	57	43
NSm	98	75	25	83	73	27
	* (χ <sup>2</sup> =.70, N.S.)					
<u>9th</u>						
Sm	34	85	15	39	90	10
NSm	108	78	22	96	77	23
	(χ <sup>2</sup> =.50, N.S.)			(χ <sup>2</sup> =1.83, N.S.)		
<u>11th</u>						
Sm	49	82	18	48	74	26
NSm	93	57	43	116	56	44
	(χ <sup>2</sup> =2.56, <.02)			(χ <sup>2</sup> =6.47, <.05)		

\*Data do not meet requirements for Chi square analysis.

Table VI

NUMBER OF WORDS OMITTED BY STUDENTS  
WHO KNEW THE SG's WARNING

	MALES			FEMALES		
	N	None	Some	N	None	Some
		%	%		%	%
<u>7th</u>						
Sm	8	14	86	14	7	93
NSm	97	21	79	73	4	96

\* \* \*

	MALES			FEMALES		
	N	None	Some	N	None	Some
		%	%		%	%
<u>9th</u>						
Sm	33	29	71	38	21	79
NSm	109	25	75	87	19	81

( $\chi^2 = .17$ , N.S.) ( $\chi^2 = 2.36$ , N.S.)

	MALES			FEMALES		
	N	None	Some	N	None	Some
		%	%		%	%
<u>11th</u>						
Sm	37	55	45	50	64	36
NSm	110	38	62	112	21	79

( $\chi^2 = 2.25$ , N.S.) ( $\chi^2 = 25.85$ , < .001)

\*Data do not meet requirements for Chi square analysis.

Table VII

NUMBER OF EXTRA WORDS BY  
STUDENTS WHO KNEW THE SG's WARNING

	MALES			FEMALES		
	N	None %	Some %	N	None %	Some %
<u>7th</u>						
Sm	7	43	57	14	29	71
NSm	98	39	61	73	40	60
	*			*		
<u>9th</u>						
Sm	34	53	47	38	47	53
NSm	108	45	55	88	40	60
	$(\chi^2 = .33, N.S.)$			$(\chi^2 = .35, N.S.)$		
<u>11th</u>						
Sm	37	62	38	48	71	29
NSm	105	53	47	120	29	71
	$(\chi^2 = .54, N.S.)$			$(\chi^2 = 22.90, < .001)$		

\*Data do not meet requirements for Chi square analysis.

Table VIII

USE OF THE WORDS  
DANGEROUS/HAZARDOUS & IS/MAY BE

	MALES			FEMALES		
	N	I <sub>s</sub> %	MB %	N	I <sub>s</sub> %	MB %
7th (Sexes Combined)						
Dangerous	49	84	16			
Hazardous	38	79	21			
	( $\chi^2 = .08$ , N.S.)					
9th						
Dangerous	50	86	14	44	82	18
Hazardous	25	48	52	31	61	39
	( $\chi^2 = 10.44$ , $< .01$ ) ( $\chi^2 = 2.94$ , N.S.)					
11th						
Dangerous	35	86	14	57	75	25
Hazardous	74	58	42	68	56	44
	( $\chi^2 = 6.99$ , $< .01$ ) ( $\chi^2 = 4.38$ , $< .05$ )					

Table IX

DANGEROUS AND HAZARDOUS  
BY SMOKING CATEGORY

	MALES			FEMALES		
	N	D %	H %	N	D %	H %
<u>7th</u>	(Not sufficient cases)					
<u>9th</u>						
Sm	28	75	25	23	70	30
NSm	44	66	34	52	62	38
	$(\chi^2 = .31, N.S.)$			$(\chi^2 = .17, N.S.)$		
<u>11th</u>						
Sm	29	45	55	39	56	44
NSm	80	28	72	86	41	59
	$(\chi^2 = 2.19, N.S.)$			$(\chi^2 = 2.07, N.S.)$		

Table X

IS AND MAY BE  
BY SMOKING CATEGORY

	MALES			FEMALES		
	N	I <sub>s</sub> %	MB %	N	I <sub>s</sub> %	MB %
<u>7th</u>	(Not sufficient cases)					
<u>9th</u>	(Not sufficient cases)					
Sm				23	61	39
NSm				37	37	13
	( $\chi^2=3.87$ , N.S.)					
<u>11th</u>						
Sm	35	74	36	46	78	22
NSm	115	70	30	101	62	38
	( $\chi^2=.05$ , N.S.)			( $\chi^2=2.93$ , N.S.)		