

Consumer/Smoker Perceptions of Federal Trade Commission Tar Ratings

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INTRODUCTION A telephone survey among a national probability sample of 1,005 adults (502 men and 503 women) 18 years of age and older was conducted between November 17 and 20, 1994. Data were weighted by age, sex, geographic region, and race so that each respondent was assigned a single weight based on the relationship between the actual population proportions of the listed characteristics and the comparable sample proportions.

The author's estimate of every-day smoking (23 percent) matches current assessments of adult U.S. smoking prevalence (22 percent). When every-day and some-days smokers were combined, the current smoking percentage (28.7 percent) was slightly higher than the Centers for Disease Control and Prevention (CDC) (1994) comparable estimate of 26.5 percent for 1992. This sample reported somewhat higher current smoking percentages for females (29 percent) than did the 1992 CDC surveys (24.6 percent). Total smoking reported by whites (29 percent) was slightly higher than in the 1992 CDC surveys (27.2 percent), whereas total smoking reported by blacks in this sample (27 percent) was virtually identical (27.8 percent). A high percentage of those who report having attended but not graduated from college were some-days smokers. When added to every-day smokers, this total was substantially higher (36 percent) than that reported in the CDC surveys (24 percent) and was closer to the CDC estimate for high school graduates (31 percent). College graduates in this sample were also somewhat more likely to smoke (19 percent compared with 15.5 percent reported in CDC surveys). Age breakdowns were not entirely comparable among the surveys, but the author's sample reported a higher incidence of smoking among 18- to 24-year-olds (32 percent compared with 26.4 percent).

TAR LEVEL OF CIGARETTES Table 1 reports the tar levels of cigarettes last smoked, determined by asking the brand, size, and other characteristics of the cigarette. These answers were compared with actual Federal Trade Commission (FTC) tar ratings. In 15 percent of the cases, respondents could not provide sufficiently detailed product information to make this comparison ("Cannot Determine" respondents). These respondents were likely to come disproportionately from lower tar categories. A four-category designation of tar levels was selected. It allowed for somewhat greater differentiation among lower tar users, had an equal number of rating scale points in each of the low-tar categories, and was consistent with a recently proposed four-category nicotine and tar rating system. Unweighted cell sizes for the five tar categories (including "Cannot Determine") shown in Table 1 were small: 28, 75, 70, 116, and 48 for those smoking cigarettes in the past 2 to 3 years.

Table 1
Tar level (percent) of cigarette last smoked

Smoker Classification (weighted data) (N)	Tar Levels (mg)				
	Very Low 1-5	Low 6-10	Medium 11-15	High 16+	Cannot Determine
Current Smokers					
Some-days smokers (56)	9	34	9	23	25
Every-day smokers (232)	8	22	21	40	10
Recent (2 to 3 years) quitters (36)	11	11	25	28	25
Those Smoking in the Past 2 to 3 Years					
All smokers (325)	9	22	19	35	14
Male (152)	5	24	13	42	17
Female (174)	12	21	25	29	12
White (268)	10	23	21	31	15
Black (28)	0	14	18	64	4
Hispanic (26)	4	15	4	58	19
High school or less education (107)	6	15	21	41	18
At least some college education (146)	12	32	23	30	12
Smokers of regular size cigarettes (145)	5	28	11	40	16
Smokers of longer cigarettes (173)	12	19	27	32	11
Smokers of soft pack cigarettes (180)	13	17	22	33	16
Smokers of hard pack cigarettes (133)	3	29	17	41	9
Smokers of plain cigarettes (223)	9	24	18	35	15
Smokers of menthol cigarettes (101)	8	20	23	38	12

Fifty-eight percent of current smokers smoked a cigarette with 15 mg or less of tar, and 9 percent smoked a cigarette with 1 to 5 mg of tar. Recent quitters tended to come from relatively higher tar categories, consistent with evidence suggesting that switching to the lowest tar cigarettes was a substitute for, rather than a stepping stone to, quitting. High-tar cigarette use was more frequent among males, blacks, and Hispanics and decreased markedly with educational attainment.

**KNOWLEDGE OF
ADVERTISED
TAR NUMBERS**

Those smoking cigarettes in the past 2 to 3 years were asked to tell the interviewer the tar number of their most recently smoked cigarette. Seventy-nine percent indicated that they did not know.

This increased to about 90 percent for those having less than a high school education, smokers ages 55 and older, and black smokers. Respondents answering "do not know" then were asked to come as close as they could, and interviewers were to probe for their "best guess." Fifty-eight percent still reported not knowing.

Initial responses were slightly more likely to be underestimates (9 percent) than correct answers (defined as plus or minus 1 mg from the actual tar level)

or overestimates (6 percent in both of the latter two categories). When probed responses were included in the analysis, there was a substantial increase in responses that underestimated tar levels (from 9 to 20 percent); there were only small changes in correct answers or overestimates. When actual tar numbers were regressed against respondents' initial and probed answers, the relationships were weak ($r = .26$ and $.20$, respectively).

Smokers of very-low-tar cigarettes had a much greater awareness of their cigarettes' tar numbers. Thirty-nine percent of those who smoked 1- to 5-mg tar cigarettes were correct initially, increasing to 50 percent with probing. These figures stand in marked contrast to responses of smokers of cigarettes with 6 to 10 mg tar, whose comparable percentages of correct responses were 4 and 9 percent, respectively.

To assess "knowledge in practice" (in addition to recall-based knowledge), half the members of the sample were asked whether a 16-mg (or, for the other half, a 5-mg) tar cigarette is lower in tar than most other cigarettes on the market. The correct answers are "no" for the 16-mg tar cigarette and "yes" for the 5-mg tar cigarette. Table 2 shows respondents' answers cross-tabulated by the tar level of their most recently smoked cigarette. Whereas 35 percent of the smokers of 1- to 5-mg tar cigarettes did not know that a 16-mg tar cigarette was *not* lower in tar, between 55 and 66 percent of all other smokers either did not know or gave incorrect responses to this question. For those

Table 2
Interpretation of Federal Trade Commission tar numbers corresponding to lower tar levels

Interpretations	Tar Levels (mg)				
	Very Low 1-5	Low 6-10	Medium 11-15	High 16+	Cannot Determine
Believe That a 16-mg Tar Cigarette Is Lower in Tar Than Most Other Cigarettes (N = 179)	(14)	(36)	(40)	(64)	(25)
% Correct	65	45	44	34	32
% Incorrect	0	10	10	16	12
% Do not know	35	45	46	50	56
Believe That a 5-mg Tar Cigarette Is Lower in Tar Than Most Other Cigarettes (N = 158)	(14)	(39)	(30)	(52)	(23)
% Correct	15	34	44	27	25
% Incorrect	13	10	14	19	16
% Do not know	73	56	42	55	59

smoking cigarettes having more than 5 mg of tar, between 56 and 74 percent either did not know that a 5-mg tar cigarette was lower in tar than most other cigarettes or said that it was not lower (with 10 to 20 percent incorrect).

**SMOKERS'
INTERPRETATIONS
OF TAR NUMBERS**

Two approaches were used to better understand how smokers interpreted the advertised tar numbers. In the first, half the sample members were asked whether a pack-a-day smoker could significantly lower his or her health risks due to smoking by switching from a 20-mg tar cigarette to a 5-mg tar cigarette; for the other half, the switch was to a 16-mg tar cigarette. In total, 56 percent of smokers thought that a switch to a 5-mg tar cigarette would significantly lower health risks, whereas 28 percent thought that a switch to a 16-mg tar cigarette would significantly lower health risks.

Table 3 cross-tabulates answers to these questions against the actual tar levels of smokers' cigarettes. For the substantive shift to a 5-mg cigarette, light-to-heavy tar cigarette smokers are evenly divided between believing there would be a significant reduction in health risks and either believing this would *not* be the case or being unsure about this. Whereas more than 60 percent of smokers did *not* think switching to a 16-mg tar cigarette would lead to a significant reduction in health risks due to smoking, a sizable proportion of light-to-heavy tar cigarette smokers either thought it would or did not know.

Table 3
Inferences (percent) about health risks as a result of switching to lower tar cigarettes

Inference	Tar Levels (mg)				
	Very Low 1-5	Low 6-10	Medium 11-15	High 16+	Cannot Determine
Switching From a 20-mg to a 5-mg Tar Cigarette Would Significantly Reduce Health Risks	83	49	49	55	60
Switching From a 20-mg to a 5-mg Tar Cigarette Would Not Significantly Reduce Health Risks	13	32	35	25	29
Do Not Know	4	19	15	20	12
Switching From a 20-mg to a 16-mg Tar Cigarette Would Significantly Reduce Health Risks	18	35	28	25	33
Switching From a 20-mg to a 16-mg Tar Cigarette Would Not Significantly Reduce Health Risks	68	61	61	61	37
Do Not Know	14	4	10	14	31
Relative Difference in Health Risks Between Those Asked About Switching to a 5-mg and Those Asked About Switching to a 16-mg Tar Cigarette	65	14	21	30	27

The interpretation of data in Table 3 is complicated by almost certainly differing beliefs of smokers in the four tar categories regarding the risks of smoking a 20-mg tar cigarette and hence about the decrease in risk from any reduction in tar level. Because the belief factor is likely to be a constant in the two versions of this question, it is useful to examine the relative reduction in health risk (i.e., the difference in benefits between switching to the 5-mg tar alternative compared with the 16-mg alternative), shown in the last row of Table 3. Once again, the evidence points to a clear difference between smokers of cigarettes with 1 to 5 mg of tar and all other smokers. These very-low-tar smokers believe that it takes a substantial reduction in tar yields to significantly reduce health risk, whereas this belief does not appear to be held by a substantial number of smokers in other categories. Unfortunately, this belief also may support a judgment that a substantial reduction in tar levels may be a reasonable substitute for quitting.

In the second approach, we examined smokers' understanding of the distinction between tar yield and delivery, together with their willingness to treat the numerical information as if it had ratio-scale properties rather than merely ordinal properties. Many of those supporting the dissemination of tar numbers have assumed that consumers would use these numbers in an ordinal fashion, essentially as if they were simply rank-ordered data. Ordinal scales do not possess the property that each numerical interval is of the same magnitude (i.e., the difference between 1 and 2 being precisely equal to the difference between 10 and 11). The FTC method may produce tar ratings that have this interval scale property for tar yields, but it cannot be said to do so for actual deliveries of tar because smokers' inhalation patterns seem to vary as they move lower on the scale. A ratio scale has the further property of having a genuine zero point so that it is proper to regard a scale score of 10 as being twice as high as a scale score of 5.

Respondents were asked to assume that a person switched from a 10-mg tar cigarette to a 1-mg tar cigarette. Then the three statements shown in Table 4 were read twice, and respondents were asked to decide which of these came closest to their opinion. Primacy and recency effects were controlled by rotating the order of the first and third statements. The first answer is the correct choice, whereas the second answer suggests some reluctance to rely on the absolute numerical values when thinking about such tradeoffs.

The general conclusion to be drawn from these data is that at least one-quarter of smokers (i.e., those selecting the third interpretation) clearly have been misled about the meaning of the tar yield numbers. Interestingly, this increases to 44 percent for smokers of very-low-tar cigarettes, in line with other evidence presented here; it also increases concern about the safety reassurances that such very-low-tar cigarettes appear to provide.

Table 4

Inferences (percent) about tradeoffs between tar deliveries and number of cigarettes smoked

Inference (relative to a 10-mg tar cigarette)	Tar Levels (mg)				
	Very Low 1-5	Low 6-10	Medium 11-15	High 16+	Cannot Determine
Person Probably Could Smoke More Than One, but These Numbers Cannot Tell You How Much Less Tar the Person Would Take in From the 1-mg Tar Cigarette	28	33	31	40	39
Person Could Smoke More Than 1 or 2 but Less Than 9 or 10 of the 1-mg Tar Cigarettes Without Taking in More Tar	18	33	22	25	22
Person Could Smoke About 10 of the 1-mg Tar Cigarettes Without Taking in More Tar	44	25	31	21	21
None of These/Do Not Know	10	10	16	14	18

SMOKERS' USE OF ADVERTISED TAR NUMBERS

The final issue under study in this survey was whether smokers reported having used these tar numbers to make judgments about the relative safety of different brands of cigarettes. In answering this question, only 14 percent of the sample indicated doing so. Once again, the smokers of 1- to 5-mg tar cigarettes were different: 56 percent of them reported using advertised tar numbers to make judgments about the relative safety of various cigarettes.

CONCLUSIONS This study demonstrates inherent difficulties in using advertised tar yield numbers to communicate meaningful information to consumers. Most smokers do not seem to pay careful attention to the numerical values per se, even to the extent of having a strong sense of the range of numerical values. Smokers of cigarettes with low- to high-tar content had considerable uncertainty about the health implications of switching to lower tar cigarettes. However, very-low-tar numbers seem to have a strong appeal to a particular group of smokers and may convey a message of absolute safety.

QUESTION-AND-ANSWER SESSION

DR. TOWNSEND: Dr. Cohen, can you tell me if you also asked the subjects the category of cigarettes that they smoked; for example, was it regular or lights or ultralights?

DR. COHEN: We did not ask them their perception of their cigarette. We asked them exactly what they smoked in terms of the size and whether their cigarettes were menthol or plain and hard pack or soft pack—but we did not ask them their perception.

DR. TOWNSEND: I am not speaking about their perception. I am speaking about the advertising associated with the cigarettes that smokers purchase. For example, if you go into a store to buy cigarettes, you can buy Winston regulars, Winston Lights, or Winston Ultra Lights. And of course, those relative categories are based on FTC tar numbers. So, you did not ask them a question like that?

DR. COHEN: No, we didn't ask that specific question.

DR. TOWNSEND: My experience, in talking with a lot of consumers, is that they do know, very clearly, the category of cigarettes that they are smoking, even though some of them do not know the accurate numbers of the cigarettes that they are smoking.

DR. COHEN: I would not disagree with you.

DR. TOWNSEND: And that ranking of categories is based on the FTC numbers. So, I think that your conclusion that the numbers are useless, I certainly do not agree with.

I think another example of that is in my recent purchase of a hot water heater. I certainly used the energy efficiency ratings in making that choice. I cannot tell you today what the energy efficiency rating actually is.

DR. COHEN: If we are here looking at the utility of the FTC tar numbers in advertising, then I think it is fair to ask if people are taking away this information. The assertion is made that this information has value to people. I am examining that assertion.

Now, if you are saying, well, it is not the numbers they care about; it is the categories, then you can present information that says they are done in four categories.

DR. TOWNSEND: In addition to that, you also said that there is at least one category where a high percentage of those smokers do look at those numbers very carefully. So, I think your conclusion that the FTC numbers are useless is certainly not true.

DR. COHEN: I do not know that I went that far; I stopped a little short of that.

DR. TOWNSEND: And I think another very practical example of the utility of the FTC relative numbers is, in fact, what has happened to the industry over the past 40 years. We have reduced the level of tar delivery, by the FTC method, from about 38 mg down to about 12 mg. I think Dr. Hoffmann spoke to that very clearly.

What has happened to cause that dramatic a change is that people trade off taste. The lower tar cigarettes generally have—or always have—fewer taste characteristics. And people find that more acceptable. So, they are making this tradeoff in the marketplace of taste and something else.

DR. COHEN: I appreciate your position, though I think we are talking about different issues here. I am talking about the utility of this information presented in this form as numbers. I am not talking about the utility of providing information about tar.

MS. WILKENFELD: I do want to add one thing to the mix to make it more complicated. You said they had to tell you the name of the cigarette they were smoking. And in order to get the actual tar number, they would have had to report specifically about the category, for example, Marlboro and Marlboro Lights. So, they may have reported correctly.

DR. KOZLOWSKI: I have found out that a lot of people in the United States who do not smoke somehow have the impression that tar and nicotine ratings are printed on the packs of cigarettes. They are in some places, for example, in Canada, but not in the United States. I think the one notable exception is the ultralow-tar cigarettes. You know, when you test Carlton as low as 1 mg tar, they are right on the pack.

If it is not on packs, if a brand is not advertised, or a person does not see an ad, how in the world would they know what the tar and nicotine yields were?

DR. COHEN: I think there is a fundamental problem. I do not think the scale has integrity. We had a scale that goes from 1 to 27. People don't care about tar; they don't know what it is. They care about harmfulness; they care about smoking risk.

If you don't present information to people along a dimension that they care about, they are not going to pay as much attention to it. And if you don't present information to people in a way so that they know how to use it, where the numbers have some meaningful quality, they will not pay attention to it. Then people are not going to be able to do as much with it.

I think there is a fundamental problem with providing information. It may be the wrong information presented the wrong way. Other than that, it is OK.

REFERENCE

Centers for Disease Control and Prevention. Cigarette smoking among adults—United States, 1992, and changes in the definition of current cigarette smoking. *MMWR. Morbidity and Mortality Weekly Report* 43(19): 342-346, 1994.