DO ADOLESCENT SMOKERS KNOW THE RISKS?

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Professor Slovic challenges Professor Viscusi by suggesting that "risk" is a term with varying meanings and the potential for misinterpretation by study participants. He distinguishes between the probability and severity of a risk, and suggests that teens who know the probability of smoking causing cancer are not aware of the severity of the experience of cancer. He goes on to note that people often perceive themselves as being less at risk than others, and observes that Professor Viscusi's study posed questions about others, instead of asking teens to assess their own risks. Thirdly, he argues that teens perceive each individual cigarette as posing a small risk even if they seem to be aware of the larger risk of smoking. Finally, since many teen smokers intend to quit, he contends, they do not see smoking as hazardous to themselves. He argues that Professor Viscusi underrates the misperception of the risks of personal addiction. Professor Slovic augments his argument with original research demonstrating that smoking teens are more likely than nonsmoking teens to perceive the short term risks of smoking as trivial.

INTRODUCTION

After many years of intense publicity about the hazards of smoking cigarettes, it is generally believed that every teenager and adult in the United States knows that smoking is hazardous to one's health. Perhaps the clearest empirical demonstration of this "fact" comes from Professor Viscusi's research on perceptions of risks from

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smoking, as reported in two papers,[1] a book,[2] and his presentation at this conference.[3]

The data reported in Professor Viscusi's book are derived from a national telephone survey of more than 3,000 persons age sixteen or older.[4] Respondents were asked: "Among 100 cigarette smokers, how many of them do you think will get lung cancer because they smoke?"[5] Analyzing responses to this question, Professor Viscusi found that people greatly overestimated the probability of a smoker getting lung cancer.[6] They also overestimated overall mortality rates from smoking and loss of life expectancy from smoking.[7] Moreover, young people ages sixteen to twenty-one overestimated these risks to an even greater extent than did older people.[8] Perceptions of risk from smoking were also found to be predictive of whether and how much people smoked, for young and old alike.[9]

Professor Viscusi argues that these and other data support a rational learning model in which consumers respond appropriately to information, making tradeoffs between the costs and benefits of smoking.[10] With respect to young people, he concludes that his findings "strongly contradict the models of individuals being lured into smoking at an early age without any cognizance of the risks."[11] Professor Viscusi further concludes that young people are so well-informed that there is little sense in informational campaigns designed to boost their awareness.[12] Finally, he observes that social policies that allow smoking only after age eighteen "run little risk of exposing uninformed decision makers to the potential hazards of

1. W. Kip Viscusi, *Do Smokers Underestimate Risks?*, 98 J. POL. ECON. 1253 (1990) [hereinafter Viscusi, *Do Smokers Underestimate*]; W. Kip Viscusi, *Variations in Risk Perceptions and Smoking Decisions*, 73 REV. ECON. & STAT. 577 (1991) [hereinafter Viscusi, *Variations*].

2. W. KIP VISCUSI, SMOKING: MAKING THE RISKY DECISION (1992) [hereinafter VISCUSI, SMOKING].

3. W. Kip Viscusi, *Constructive Cigarette Regulation*, 47 DUKE L.J. 1095 (1998).

4. *See* Viscusi, *Do Smokers Underestimate*, *supra* note 1 at 1256; VISCUSI, SMOKING, *supra* note 2, at 62, 69.

5. *See* VISCUSI, SMOKING, *supra* note 2, at 64.

6. At one point, Viscusi states that consumer perception of the lung cancer risk from smoking "*dwarfs* scientists' estimates of the actual risk level." *Id.* at 142 (emphasis added).

7. *See id.* at 77.

8. *See id.* at 123.

9. *See id.* at 87-115.

10. *See id.* at 115.

11. *Id.* at 143.

12. *See id.* at 145-46.

smoking."[13] Professor Viscusi's data and conclusions thus appear to lend support to the defense used by cigarette companies to fend off lawsuits from diseased smokers: these people knew the risks and made an informed, rational choice to smoke.

In so concluding, Professor Viscusi assumes that people's knowledge of the risks of cigarette smoking is adequately represented by their judgments that cigarettes will cause cancer (or some other disease) in n out of 100 smokers. I disagree with this assumption.

My disagreement is based on four failings I perceive in Professor Viscusi's analyses. The first is the faulty assumption that one knows the "risk" of an activity if one knows the *probability* of an adverse outcome of that activity, even if one does not fully comprehend the *severity* of such an outcome. The second is the failure to consider the optimism bias that leads people to see themselves as less at risk than others. The third is the failure to consider the repetitive nature of cigarette smoking and the cumulative nature of its risks. The fourth is the failure to consider young people's misperceptions of the probability of becoming addicted to smoking.

I. RISK AS PROBABILITY

Both lay people and experts use the word "risk" inconsistently, sometimes using it to mean a hazardous activity ("Bungee jumping is a serious risk."), sometimes to mean an adverse consequence ("The risk of letting your parking meter expire is getting a ticket."), and sometimes to mean probability ("What is the annual risk of death at age eighty?"). It is this last concept, risk as probability, that Professor Viscusi embraces when he equates risk perception with answers to the question: "Among 100 cigarette smokers, how many of them do you think will get lung cancer because they smoke?"[14]

There is a fourth definition of "risk" that, to my mind, is more appropriate than any of the preceding three. According to this definition, "risk" is a blend of the probability and the severity of consequences.

The inadequacy of equating risk with the probability of an adverse consequence is shown by data from Sjöberg, who asked people to judge the relative risk of forty-three adverse consequences.[15] This

13. *Id.* at 149.

14. Viscusi, *Do Smokers Underestimate*, *supra* note 1, at 1256. Professor Viscusi uses data gathered in a 'risk perception' survey which asked this question, among others.

15. *See* LENNART SJÖBERG, PERCEIVED RISK V. DEMAND FOR RISK REDUCTION 4

form of questioning leads people to judge risk in terms of probability. As a result, "trivial risks" such as the risk of catching a cold or being bothered by a drunk person in the subway emerged as the highest "risks" of all, far higher than risks from smoking, alcohol, motor vehicles, or AIDS.[16] This is because the perceived probabilities of the trivial consequences were higher. When questions were phrased to induce people to think also of the magnitude of a danger or threat and thus to attend to both probability and severity of consequences ("What is the risk of an activity that might lead to AIDS" or "What is the risk of an activity that might cause a cold?"), then hazards imposing trivial consequences were judged less risky than those associated with more serious consequences.[17]

My point is a simple one. Appreciating the risks of smoking means appreciating the nature of the consequences as well as the probabilities of those consequences. I have seen no evidence to show that young people have realistic knowledge of what it is like to experience lung cancer, chronic obstructive pulmonary disease, or any of the other fates awaiting smokers that many would consider "worse than death."

The difficulty of appreciating the unfamiliar consequences of one's decisions has long been recognized by doctors attempting to inform patients about treatment risks. For example, one can convey to a patient deciding whether to undergo laryngectomy for throat cancer that it is almost certain that normal speech will be lost, but it is quite difficult to convey what it feels like to experience that loss. Do most patients adapt well to it? Are they satisfied or regretful after having that surgery? Personal contact or videotaped interviews with patients who are experiencing such outcomes appear to help convey the meaning of such outcomes.[18]

II. THE OPTIMISM BIAS

Professor Viscusi relies upon questions that ask individuals to judge the risks to "100 smokers," not the risks to themselves. Numer-

(Rhizikon Risk Research Report No. 18, 1994).

16. *See id.* at 22-26.

17. *See* Paul Slovic, *Are Trivial Risks the Greatest Risks of All?* 6-7 (Working Paper No. 98-6) (1998) (on file with author).

18. *See* Michael J. Barry et al., *Patient Reactions to a Program Designed to Facilitate Patient Participation in Treatment Decisions for Benign Prostrate Hyperplasia*, 33 MED. CARE 771, 777 (1995).

ous studies have found that people consistently believe that their personal risk is less than the risk faced by others in the same situation.[19] Research has not only demonstrated the existence of such "optimistic biases" for a wide range of health and safety hazards, but has identified types of hazards for which biases are likely to be especially great.[20] Optimistic biases are greatest for hazards judged to be controllable by personal action, such as lifestyle risks. Biases are also likely to be large when people think that signs of vulnerability will appear early, because people then think that an absence of present signs means they are exempt from future risks.[21] Because smoking fits in both of these categories, it is not surprising that strong optimistic biases have been found in cigarette smokers.[22] Young smokers are highly likely to see themselves as less at risk from cigarettes than the 100 hypothetical smokers asked about in the survey questionnaire.

III. THE CUMULATIVE NATURE OF RISKS FROM SMOKING

Cigarette smoking takes place one cigarette at a time. A person smoking one pack of cigarettes every day for forty years smokes about 300,000 cigarettes. I question whether most smokers appreciate how health risks from smoking accumulate across these many single acts. Little is known about this aspect of "knowing a risk." However, an experimental study found that subjects were more willing to expose themselves to a fictional risk from a chemical carcinogen described as cumulative ("the poison builds up in your body") than to take a statistically equivalent risk described as a series of independent exposures ("the poison does not build up—if a dose does not make you sick it will pass right through you without doing any harm").[23] It appeared that people making decisions about a cumula-

19. *See, e.g.*, Neil D. Weinstein, *Optimistic Biases About Personal Risks*, 246 SCIENCE 1232 (1989).

20. *See, e.g.*, Neil D. Weinstein, *Unrealistic Optimism About Susceptibility to Health Problems: Conclusions From a Community-Wide Sample*, 10 J. BEHAV. MED. 481 (1987) (discussing types of hazards and associated optimistic biases).

21. *See id.* at 488.

22. *See generally, e.g.*, Suzanne C. Segerstrom et al., *Optimistic Bias Among Cigarette Smokers*, 23 J. APPLIED SOC. PSYCH. 1606 (1993) (finding that smokers unrealistically deny risks to themselves despite admitting risks to others); F.P. McKenna, *Exploring the Limits of Optimism: The Case of Smokers' Decision Making*, 84 BRIT. J. PSYCH. 389 (1993) (same); Christina Lee, *Perceptions of Immunity to Disease in Adult Smokers*, 12 J. BEHAV. MED. 267 (1989) (same).

23. *See* William P. Diamond, *Effects of Describing Long-Term Risks as Cumulative or Noncumulative*, 11 BASIC & APPLIED SOC. PSYCHOL. 405, 412 (1990).

tive hazard tended to believe that the first few exposures would be safe. This tendency was less apparent among subjects making decisions about independent exposures, despite the fact that both groups were told that the first five exposures would make the risk of succumbing to the toxin equal to 50%.[24]

One might hypothesize that young people, like the experimental subjects described above, believe they can get away with some amount of smoking before the risk takes hold. Adolescent smokers may tend to believe that smoking the "very next cigarette" poses little or no risk to their health or that smoking for only a few years poses negligible risk. And there is some evidence that young smokers are more prone to believe in the safety of short-term smoking than are young nonsmokers. In the 1989 Teenage Attitudes and Practices Survey, 21% of smokers in the twelve to eighteen age range said they believed it was safe to smoke for only a year or two (compared to 3% of those who had never smoked).[25]

I tested this hypothesis in a survey of high school students (grades nine through twelve) located in a small coastal town in Oregon. The survey asked whether the respondent smoked, and if so, how many cigarettes he or she smoked every day, on average. Next, respondents were asked to evaluate the following statements:

> Consider the following statements about the effects of a person's smoking one package of cigarettes each day starting at age 16 and indicate whether you agree or disagree with each statement.
>
> 1. There is really no risk at all for the first few years.
>
> 2. Every single cigarette smoked causes a little bit of harm.
>
> 3. Although smoking may eventually harm this person's health, the *very next single cigarette* he or she smokes will probably not cause any harm.
>
> 4. Harmful effects of smoking rarely occur until a person has smoked steadily for many years.

24. *See id.* at 417-18.

25. *See* Karen F. Allen et al., *Teenage Tobacco Use: Data Estimates from the Teenage Attitudes and Practices Survey*, 224 ADVANCE DATA 1, 21 (1993).

> 5. Smoking at the daily rate of one package of cigarettes each day will eventually harm this person's health. [26]

Respondents evaluated these statements on a scale labeled: strongly agree, agree, disagree, strongly disagree, and don't know/no opinion.

Figure 1 contrasts the survey responses of fifty smokers (defined as those who said they smoked six or more cigarettes per day), forty-eight light smokers (one to five cigarettes per day), and 223 non-smokers (zero cigarettes per day).

Figure 1 indicates that almost every nonsmoker and every smoker agreed that smoking a package of cigarettes each day will eventually harm a person's health (statement 5). Similarly, high percentages of agreement were found for the statement that every single cigarette smoked causes a little bit of harm (statement 2). However, the picture changes for each of the other questions pertaining to the

26. These survey questions are on file with the author.

near-term risks of smoking. The smokers in this study were considerably more likely than nonsmokers to agree with statements denying short-term risks. Responses from light smokers fell between the responses of nonsmokers and smokers for statements 1 and 3 and were equal to those of smokers for statement 4. Looking at statement 1 in figure 1, we see that about one-third of those who smoked more than six cigarettes per day believed that there is "really no risk at all" from smoking a pack of cigarettes daily for the first few years after starting to smoke, and about 40% saw no harm associated with the very next cigarette smoked (statement 3). Fifty percent of the smokers believed that harmful effects of smoking rarely occur until a person has smoked steadily for many years (statement 4).

The results of this study verify the contention of cigarette manufacturers and the results of previous investigations by Professor Viscusi and others indicating that most young people acknowledge that extensive smoking is likely to harm one's health.[27] Young smokers appear to acknowledge this to the same extent as nonsmokers. However, the present study also demonstrates a degree of denial about the short-term risks from smoking—and this denial is considerably more prevalent among smokers.

IV. THE RISK OF ADDICTION

Belief in the short-term safety of smoking may combine insidiously with a tendency of young smokers to underestimate or be uninformed about the difficulty of stopping smoking. Many young people regret their decisions to start smoking and unsuccessfully attempt to stop. The 1989 Teenage Attitudes and Practices Survey found that 74% of adolescent smokers reported that they had seriously thought about quitting, and that 76% had tried to quit in the previous six months.[28] A longitudinal survey conducted as part of the University of Michigan's Monitoring the Future Study found that 85% of high school seniors predicted that they probably or definitely would not be smoking in five years, as did 32% of those who smoked one or more packs of cigarettes per day.[29] However, in a follow-up study five to six

27. *See, e.g.*, Viscusi, *Variations*, *supra* note 1, at 587 (concluding that young people overestimate risks of smoking); Howard Leventhal et al., *Is the Smoking Decision an 'Informed Choice'?*, 257 JAMA 3373, 3374 (1987) (finding almost universal acknowledgement of the health harms of smoking).

28. *See* Allen et al., *supra* note 25, at 2.

29. U.S. DEP'T OF HEALTH AND HUMAN SERVICES, PREVENTING TOBACCO USE AMONG

years later, of those who had smoked at least one pack per day as seniors, only 13% had quit and 72% still smoked one pack or more per day.[30] Of those who smoked one to five cigarettes per day as seniors, only 32% had quit and 48% had actually increased their cigarette consumption.[31] Other researchers found that adolescent smokers were less knowledgeable than their nonsmoking peers about the problems of addiction.[32]

The high percentage of young smokers who say that they have seriously thought about quitting suggests that they regret their decision to begin smoking. Evidence for this change in perspective comes from a recent survey in which fifty-eight University of Oregon students who smoked cigarettes daily were asked: "If you could go back to the time when you first began to smoke, would you decide to smoke again?"[33] The answer was no for 55.2% of the smokers and yes for only 36.2%. Among those who had smoked for five years or more, 65% said they would not decide to smoke again compared to 27% who said they would. The fact that so many long-term smokers regret beginning to smoke attests to the difficulty of stopping smoking.

CONCLUSION

Many young smokers perceive themselves to be at little or no risk from smoking because they expect to stop smoking before any damage to their health occurs. In reality, a high percentage of young smokers continue to smoke over a long period of time and are placed at risk by their habits.

Being knowledgeable about the risks from cigarettes means more than just knowing the probabilities of contracting disease after decades of heavy smoking. It means appreciating the severity of the disease consequences, appreciating the cumulative nature of smoking risks, and appreciating the difficulty of stopping the behavior once it has been initiated. By failing to appreciate the severe and cumulative consequences of an addictive behavior, young people can be said to underestimate the risks of smoking.

YOUNG PEOPLE: A REPORT OF THE SURGEON GENERAL 84 (1994).

30. *Id.* at 86.

31. *Id.*

32. *See* Leventhal et al., *supra* note 27, at 3375.

33. This data is from an unpublished study by the author conducted in May, 1998.