



Tobacco: The Limits of Child Protection

Is Smoking Delayed Smoking Averted?

| Sherry Glied, PhD

Antismoking efforts often target teenagers in the hope of producing a new generation of never smokers. Teenagers are more responsive to tobacco taxes than are adults.

The author summarizes recent evidence suggesting that delaying smoking initiation among teenagers through higher taxes does not generate proportionate reductions in prevalence rates through adulthood. In consequence, the impact of taxes on smoking among youths overstates the potential long-term public health effects of this tobacco control strategy. (*Am J Public Health*. 2003;93:412–416)

CONTEMPORARY TOBACCO

control policy has concentrated its fire on reducing smoking initiation among teenagers. According to Donna Shalala, former secretary of health and human services, the rhetoric used to justify measures designed to control adolescent smoking emphasizes that, “among children living in America today, 5 million will die an early preventable death because of a decision made as a child.”¹ This focus is operationalized in the terms of the 1998 master settlement agreement between the state attorneys general and the tobacco industry; many

of the agreement’s clauses concern restrictions on tobacco advertising, promotion, and sales to young people. The focus is similarly reflected in the close attention tobacco use analysts pay to changes in annual data on patterns of cigarette smoking among youths.

Educating young people and helping them to make rational decisions in regard to smoking is sound and appropriate public policy. Yet, from a public health perspective, the harms of cigarette smoking are—with the important exception of the effects of smoking during pregnancy on fetal health²—only distantly connected to the smoking behavior of teens. Most of the health effects of smoking occur later in life, after years of exposure. Quitting can reverse many of the ill health consequences of earlier smoking.³ Thus, the main purpose of programs designed to reduce smoking among teens is instrumental: to reduce smoking among adults.

The public health logic of concern over youth smoking is primarily that reducing youth smoking is the best way to reduce smoking overall. The principal conclusion of the 1994 surgeon general’s report on smoking was

that “[n]early all first use of tobacco occurs before high school graduation; this finding suggests that if adolescents can be kept tobacco free, most will never start using tobacco.”⁴(p543)

While quitting smoking is very difficult, focusing on teens may, as Elders et al.⁴ have suggested, produce a new generation of never smokers. Anti-smoking efforts focused on teenagers may be not only more politically saleable, but also more effective, than broader efforts. Teenagers are more susceptible than are adults to a range of inducements toward curbing smoking. For example, they respond more strongly to tobacco taxes. The price elasticity of demand for smoking—the standard measure of responsiveness to taxation—is 2 to 3 times as high among teenagers as it is among adults.^{5,6}

Similarly, marketing analysts believe that teens are more responsive to advertising because their tastes have not yet been fully formed. As David Verklein, CEO of Cara International (a media buyer), stated recently in a National Public Radio report, younger buyers “haven’t made all their brand choices . . . and if you could reach them and get

them to be users of your brand at an early age, you’ll have them for a lifetime.” For this reason, a 30-second commercial on *The Late Show with David Letterman* produces 38% more revenue than a similar commercial on *Nightline*, although the *Nightline* audience is only 4 years older, and about 10% larger, than Letterman’s audience. The literature on responsiveness thus suggests that targeting teen smokers will generate a larger reduction in smoking for a given cost than targeting adults.

Reducing smoking among teens is a necessary condition for a program aimed at young people to have an effect on adult smoking rates. But it may not be a sufficient condition. The smoking rate among adults in the United States is lower than the corresponding rate among youths.^{7,8} Many factors intervene between youth and adulthood in terms of the decision to smoke. A complete evaluation of the effects of antismoking efforts cannot assume that delaying smoking initiation among teenagers will generate persistent reductions in prevalence through adulthood.

The effects of programs designed to reduce smoking among



youths may remain constant, intensify, or diminish over time. Programs that discourage smoking may educate even those who do begin smoking. As these smokers grow older, such programs may increase later quit rates. Or it may be that tobacco control programs are most effective among those who are most susceptible to long-term addiction.

If late initiators find quitting easier (as some evidence suggests), programs that delay smoking may also increase quitting behavior.⁹ In these cases, the program's effects intensify over time. Alternatively, adults who were discouraged from smoking by a program may change their minds as their incomes increase or they join new peer communities. In such cases, the program's effects diminish over time.

LONG-TERM EFFECTS OF CIGARETTE TAXES

Evaluations of programs designed to reduce smoking among teens generally examine effects on teenage smoking rates. To examine the long-term consequences of teen smoking reduction programs, however, analysts need to follow people over time. Two recent studies involved this type of design, assessing the long-term effects of cigarette taxes experienced during youth on adult smoking rates. Both focused on tobacco taxation, because taxes appear to be the best method of reducing smoking among teens.⁵

One study, that of Gruber and Zinman,¹⁰ related the smoking behavior of pregnant women to

the cigarette taxes in force in their youth. Gruber and Zinman matched Vital Statistics Natality File data on smoking during pregnancy among women 24 years or older to information on cigarette taxes in the women's state of birth when they were aged 14 to 17 years. They found that the price elasticity of smoking consumption (including both whether women smoked and how much they smoked) with respect to cigarette taxes when the women were 14 years of age was about 30% as high as the estimated effect of these taxes on adolescents. The corresponding effect on adult smoking participation (i.e., whether women smoked or did not smoke) was only 25% as great.

In a recent paper, I used data from the National Longitudinal Survey of Youth (NLSY), involving a panel of young people followed from 1979 (when they were aged 14–24 years) through 1994 (when they were 29–39 years old), to examine the same question.¹¹ The NLSY asked about current smoking and smoking initiation in its 1984 and 1992 surveys and about current smoking in its 1994 survey. Also, in addition to retrospective information on respondents' residence at the age of 14 years, information was collected on state of residency in each of the study years. These data can be matched to tax information, and thus a full cigarette tax history can be constructed for each member of the panel. The fact that the NLSY followed a single cohort eliminated problems involving changes in the informa-

tion available to smokers over time.

My estimates of the effects of contemporaneous cigarette taxes on smoking are in line with the existing literature: they suggest that a 10% increase in cigarette taxes leads to about a 1% decline in adult smoking participation. However, my estimates of the effects of taxes at the age of 14 years on later smoking suggest that these effects attenuate considerably over time. I repeated the analyses for different subsamples of the population (men, women, and those who were members of low-income families when they were 14 years of age) and found attenuation effects in all of these subsamples, with the greatest effects exhibited among low-income people and women.

The overall results of my study and that of Gruber and Zinman are summarized in Figure 1, which shows the effect of a 10% increase in tobacco taxes faced at the age of 14 years on smoking participation at subsequent ages. It can be seen that, among pregnant women, the effect on smoking participation of a 10% increase in tobacco taxes at the age of 14 years is below 1%. Among women in the NLSY, the estimated effect of taxes had disappeared entirely by the time they were 39 years old. Among men, the effects persisted but were much smaller when the respondents were 39 years of age than when they were 14 years of age.

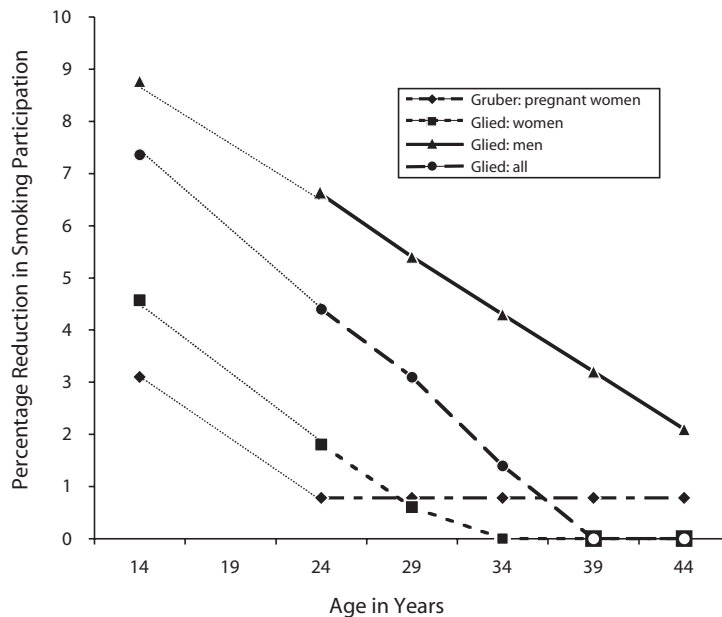
In themselves, the implications of these studies are limited and should be viewed as provisional. They are based on special popu-

lations (Gruber and Zinman) or small samples (Glied). Yet, they do raise the possibility that controlling smoking among teens may not, in itself, yield substantial reductions in adult smoking rates. These studies imply that measuring the impact of tax policies on smoking among youths is likely to overstate potential public health effects. Similarly, short-term changes in youth smoking rates may matter less than media attention might suggest. Fine-tuning policy to address fluctuations in youth smoking rates may be unwarranted.

These 2 studies also raise some doubt regarding the conventional wisdom that taxes are the best way to control youth smoking.⁵ The studies examined only the effects of tobacco taxation; they did not assess the effects of other forms of tobacco control. It may well be that approaches aimed at changing adolescents' attitudes toward smoking, which are less effective than taxes in the short run, yield larger long-term benefits than approaches that target teen wallets. All in all, researchers need to take a longer term look at the effects of tobacco control policies.

TARGETING YOUTHS

The statistical fact that most people begin smoking when they are teens is simply not enough to draw the inference that reducing smoking among teenagers will, in itself, generate substantial reductions in this behavior among adults. This is confirmed by studies of other behaviors that typically begin in youth. For exam-



Sources: Gruber and Zinman,¹¹ Glied¹²

FIGURE 1—Long-term reductions in smoking participation produced by a 10% cigarette tax increase.

ple, Cook and Moore¹² found that raising the drinking age had no discernible effect on the probability that a youth would drink as an adult, although it might slightly lower his or her propensity toward later binge drinking (they found no persistent effects of beer taxes on either drinking or bingeing). Moreover, it has been shown that delaying initiation of childbearing beyond the teenage years has little, if any, effect on cumulative achieved parity among women who go on to have children.^{13–15} Teen mothers have their babies earlier, but White and Black teen mothers appear to have correspondingly fewer children in young adulthood than do those who postpone childbearing. (Ribar¹³ found that Hispanic teen mothers had

higher parities than those who postponed childbearing.)

The evidence on average age of smoking initiation similarly suggests that there is no particular susceptibility to smoking associated with being a teenager that might imply that delaying smoking beyond the adolescent years would lead to overall reductions in smoking rates. Figure 2 shows the median and 75th percentile ages of smoking initiation among different cohorts of men and women 25 years or older; data were derived from the 1997 National Health Interview Survey. If teenage irrationality leads to increased susceptibility, average age of initiation should have fallen after publication of the surgeon general's 1965 report, which led to large declines in ini-

tiation rates and increases in cessation rates. Yet, as can be seen in Figure 2, among cohorts born both before and after 1948, approximately 25% of men who had ever smoked initiated smoking after the age of 18 years.

Declines in age of initiation have occurred steadily among women. Women's smoking behavior has become more and more similar to that of men over time. The median age of smoking initiation among women who were born after 1968 and had ever smoked was 16 years (assuming that the women in this cohort are no longer initiating smoking). Among earlier generations of women, however, smoking initiation generally occurred in young adulthood. Among women born between 1948 and

1957, the median age of smoking initiation was 18 years, and among women born before 1928 who had ever smoked, the median age of initiation was 20 years. More than one fourth of the women older than 40 years who had ever smoked began smoking after 22 years of age. These data suggest that being a teenager is not a necessary prerequisite to initiating smoking.

CONCLUSIONS

Targeting young smokers is a politically appealing way to address the public health problem of tobacco use. In a recent poll, 77% of respondents agreed that "[t]he government should take steps to reduce teen-aged smoking. However, adults who want to smoke should be free to make their own decision."¹⁶ Some economists have found evidence suggesting that adult smokers may behave rationally, weighing the costs and benefits of their decisions.¹⁷ Such evidence lends weight to arguments that policies designed to discourage adult smoking are paternalistic and encroach on individual freedom.¹⁸ By contrast, teenagers may not have the capacity to make rational decisions about substances that cause damage in the distant future.^{19,20} Our concerns about teenage knowledge and rationality are implicit in rules that limit to adults the right to vote and to serve on a jury. In this light, preventing young people—or, as former secretary Shalala put it, children—from making decisions with long-term negative consequences is politically acceptable.

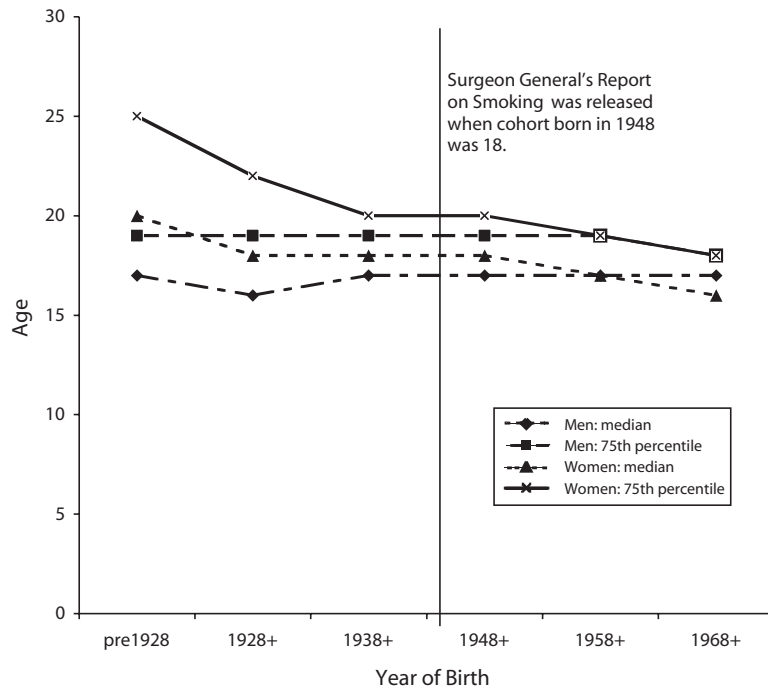


FIGURE 2—Age at smoking initiation, by sex and year of birth, median and 75th percentile: National Health Interview Survey, 1997.

If they are to have long-term effects, however, efforts to reduce smoking among teens need to be sustained into adulthood and should encompass changes in adult behavior rather than simply focusing on adolescent initiation. Indeed, the greatest long-term health benefit of raising taxes to prevent youth smoking is that it inevitably raises taxes for adults at the same time. In the study described earlier, Gruber and Zinman¹⁰ found that the tobacco taxes pregnant women face as adults are 6 times as effective in reducing their current smoking participation as the taxes they faced in youth.

Focusing attention on adults is also consistent with the fact that more than 80% of current smok-

ers want to quit²¹ and about two thirds have made at least one serious attempt to do so.²² Although quitting smoking is very difficult, the number of adult Americans who are former smokers is nearly as high as the number who are current smokers (44.8 million vs 47.2 million in 1998). Among those older than 45 years, among all Whites, and among all men, former smokers outnumber current smokers.²³ (Former smokers also considerably outnumber current smokers in the population older than 65 years, but this difference may be substantially attributable to differential mortality rates.) The continuing high rates of quitting suggest that encouraging adult cessation, while difficult, may be

at least as effective a long-term policy strategy as reducing teenage initiation.

There is ample reason for public policy to help smokers engage in actions that promote public health and that smokers themselves wish to undertake. A growing literature in the area of behavioral economics highlights the efforts people make to develop self-control.^{24,25} This literature has recently been applied to considering the time inconsistency of preferences surrounding smoking.²⁶ Recent empirical estimates based on these models suggest that, by promoting self-control, the raising of tobacco taxes might even result in adult smokers being subjectively better off in that

their smoking rates may be reduced.²⁷ Consistent with these estimates, a surprisingly large minority of adult smokers (more than 25%) favor at least some smoking bans.²¹

Public opinion and public policy have long favored control of youth smoking. If delaying smoking among young people does not, in itself, lead to persistent reductions in smoking over the long term, as the 2 recent studies described here suggest it may not, we need to rethink this approach. Those responsible for public policy need to consider approaches that sustain delayed initiation into adulthood. In the long run, helping adults achieve their own goals may be as effective a tobacco control strategy as changing teenage minds. ■

About the Author

The author is with the Department of Health Policy and Management, Mailman School of Public Health, Columbia University, New York, NY.

Requests for reprints should be sent to Sherry Glied, PhD, Department of Health Policy and Management, Mailman School of Public Health, Columbia University, 600 West 168th, 6th Floor, New York, NY 10032 (e-mail: sag1@columbia.edu).

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References

1. *Hearings Before the Senate Labor and Human Resources Committee*, 105th Cong, 1st Sess (1997) (testimony of Donna Shalala).
2. Cliver SP, Goldenberg RL, Cutter GR, Hoffman HD, Davis RO, Nelson KG. The effect of cigarette smoking on neonatal anthropometric measurements. *Obstet Gynecol*. 1995; 85:625–630.
3. *Smoking Among U.S. Adults: Fact Sheet*. Atlanta, Ga: Centers for Disease Control and Prevention, Office of Smoking and Health; 1997.



4. Elders MJ, Perry CL, Eriksen MP, Giovino GA. The report of the surgeon general: preventing tobacco use among young people. *Am J Public Health*. 1994;84:543–547.
5. Chaloupka FJ, Warner K. The economics of smoking. In: Culyer A, Newhouse J, eds. *Handbook of Health Economics*. Vol. 1. Amsterdam, the Netherlands: Elsevier; 2000: 1539–1627.
6. Evans WN, Ringel JS, Stech D. Tobacco taxes and public policy to discourage smoking. In: Poterba J, ed. *Tax Policy and the Economy*. Vol. 13. Cambridge, Mass: National Bureau of Economic Research; 1999:1–55.
7. Centers for Disease Control and Prevention. Cigarette smoking among adults—United States, 1999. *MMWR Morb Mortal Wkly Rep*. 2001;50: 869–873.
8. Centers for Disease Control and Prevention. Trends in cigarette smoking among high school students—United States, 1991–2001. *MMWR Morb Mortal Wkly Rep*. 2002;51:409–412.
9. Breslau N, Peterson EL. Smoking cessation in young adults: age at initiation of cigarette smoking and other suspected influences. *Am J Public Health*. 1996;86:214–220.
10. Gruber J, Zinman J. Youth smoking in the U.S.: evidence and implications.” In: Gruber J, ed. *Risky Behaviors Among Youths*. Chicago, Ill: University of Chicago Press; 2001:69–120.
11. Glied S. Youth tobacco control: reconciling theory and empirical evidence. *J Health Economics*. 2002;21:117–135.
12. Cook PJ, Moore MJ. Environment and persistence in youthful drinking patterns. In: Gruber J, ed. *Risky Behaviors Among Youths*. Chicago, Ill: University of Chicago Press; 2001:375–437.
13. Ribar DC. The effect of teenage fertility on young adult childbearing. *J Popul Economics*. 1996;9:197–218.
14. Heckman JJ, Walker JR. Economic models of fertility dynamics: a study of Swedish fertility. In: *Research in Population Economics*. Vol. 7. Greenwich, Conn: JAI Press; 1991:3–91.
15. Heckman JJ, Hotz VJ, Walker JR. The influence of early fertility on subsequent births and the importance of controlling for unobserved heterogeneity. *Bull Int Stat Inst*. 1985;51:1–15.
16. Portrait of America. *The Government Should Take Steps to Reduce Teen-Aged Smoking*. Mathews, NC: Rasmussen Research; 2000.
17. Becker GS, Grossman M, Murphy KM. An empirical analysis of cigarette addiction. *Am Econ Rev*. 1994;84:396–418.
18. Schaler JA, Schaler ME. The smoking controversy: a right to protect versus a right to smoke. In Schaler JA, Schaler ME, eds. *Smoking: Who Has the Right?* New York, NY: Prometheus Books; 1998:9–20.
19. Orphanides A, Zervos D. Rational addiction with learning and regret. *J Political Economy*. 1995;103:739–758.
20. Suranovic SM, Goldfarb RS, Leonard TC. An economic theory of cigarette addiction. *J Health Economics*. 1998;18:1–29.
21. *The Gallup Poll: Public Opinion 2000*. Wilmington, Del: Scholarly Resources Inc; 2000.
22. *The Gallup Poll: Public Opinion 1999*. Wilmington, Del: Scholarly Resources Inc; 1999.
23. Centers for Disease Control and Prevention. Number (in millions) of adults 18 years and older who were current, former, or never smokers, overall and by sex, race, Hispanic origin, age, and education, National Health Interview Surveys, selected years—United States, 1965–1995. Available at: http://www.cdc.gov/tobacco/research_data/adults_prev/tab_3.htm. Accessed June 21, 2002.
24. Schelling TC. Self-command in practice, in policy, and in a theory of rational choice. *Am Econ Rev*. 1984;74: 1–11.
25. Thaler R, Shefrin HM. An economic theory of self-control. *J Political Economy*. 1981;89:392–406.
26. Gruber J, Koszegi. 2001. Is addiction ‘rational’? Theory and evidence. *QJ Economics*. 2001;116:1261–1303.
27. Gruber J, Mullainathan S. *Do Cigarette Taxes Make Smokers Happier?* Cambridge, Mass: National Bureau of Economic Research; 2002.