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Cover: Early scripts, such as the hieroglyphics that cover this graffiti-marred eighth century A.D. stone monument at the Maya site of Copan in Honduras, have often been characterized as having evolved gradually toward more sophisticated forms, eventually reaching the crowning achievement of the Greek alphabet. But some researchers now argue that the first writing systems sprouted quickly, boasted at least as much complexity as the alphabet, and may have been read to some extent by more people than has often been assumed. (Photo: Payson D. Sheets)



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Science Service, which publishes SCIENCE NEWS, is a nonprofit corporation founded in 1921. It gratefully accepts tax-deductible contributions and bequests to assist its efforts to increase the public understanding of science, with special emphasis on young people. More recently, it has included in its mission increasing scientific literacy among members of underrepresented groups. Through its Youth Programs it administers the International Science and Engineering Fair, the Science Talent Search for the Westinghouse Science Scholarships, and publishes and distributes the *Directory of Student Science Training Programs for Precollege Students*.

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Letters

Where there's smoking . . .

The article "Smoke Gets in Your Brain" (SN: 1/16/93, p.46) summarizing the findings of Spilich and colleagues is a classic example of coverage of weak research that produces "politically correct" results.

Grunberg's remarks that nicotine may exert its desirable mental effects within an "optimal dose range" of intake hint at the research's major flaw. Smokers typically exhibit a range of puffing-inhalation behaviors that results in a range of nicotine intake. However, smoking in the Spilich studies followed a rigid schedule of 12 puffs on a 1.2-milligram nicotine-yield cigarette, with the smoke being held in the lungs for five seconds. This could have resulted in most participants taking in more nicotine than desired. Even in experienced smokers, "over-smoking" can produce symptoms such as

lightheadedness and nausea (hardly conducive to the performance of complex mental tasks). Even in the absence of feeling bad, it is doubtful that most of Spilich's subjects took in an "optimal" amount of nicotine.

Three other points: (1) Spilich's short-term memory (STM) scanning results are at variance with numerous previous studies demonstrating that nicotine facilitates STM scanning. (2) The finding of some smoker-nonsmoker differences says *nothing* regarding effects of nicotine on thinking. On average, smokers have lower IQs than nonsmokers. Indeed, Spilich admitted as much: ". . . pre-experimental differences in . . . IQ [and] personality . . . might differentiate our smoking and nonsmoking subjects" (BRITISH JOURNAL OF ADDICTION, September 1992, p.1315). No such differentiation was attempted, however. (3) Only the "smoking smokers had more accidents" part of

the driving results was covered by SCIENCE NEWS. In fact, smoking smokers also stayed "in the game" longer, apparently by going faster. Since accidents in the game involved no "real" penalty, a stronger experiment would have penalized accidents (e.g., subtracting some amount of "bonus money"). The greater number of traffic accidents associated with smokers as a group can largely be accounted for by personality differences that predate the onset of smoking.

Walter S. Pritchard
Senior Staff Scientist
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R.J. Reynolds Tobacco Co.
Winston-Salem, N.C.

It seems that the article focused on the paper by Spilich and ignored the vast body of
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Tallying traffic's hidden costs

Motorists frequently complain that they pay more than their fair share for the use of roads, bridges, and highways. But a new study indicates that drivers "are actually beneficiaries of immense subsidies," says energy economist Charles Komanoff, a New York City-based consultant and confirmed bicyclist.

For instance, New York State roadway expenditures in 1990 exceeded revenues collected from motorists by \$1.9 billion, he reports. Prorating this and similar figures for New Jersey and Connecticut, he found that "direct fiscal subsidies to motorists amount to roughly \$750 million a year in New York City proper and \$850 million for the rest of the metropolitan region." Workers and area firms pay the subsidies through various taxes on income, sales, and property.

Together with Brooklyn-based consultant Brian Ketcham, Komanoff also calculated motoring's hidden costs. Their analyses, again focusing on the New York metro area, suggest that the public at large pays almost half — \$26 billion — of the estimated \$55 billion in indirect costs attributable annually to motoring. Among the subsidies, they calculate, lurks the about \$5.7 billion each that the public pays annually for accidents and for air pollution damage to health and property.

The researchers valued public land used by private cars at \$4.9 billion annually and traffic noise in New York's metro area at \$2.8 billion. The remaining \$6.3 billion in public costs is paid for in congestion (time lost by bus passengers, pedestrians, and cyclists), vibration damage to various structures, increased military costs to keep foreign oil flowing, and climate change costs from burning fossil fuels.

This analysis indicates that indirect public subsidies to drivers total more than 30 times the direct government subsidies —

or an amount "equivalent to \$3,000 taken forcibly and unawares every year out of the pockets of each man, woman, and child in the New York metropolitan area," Komanoff says.

National figures, he maintains, "are very similar to those for the New York area on a per capita basis" — although the public's share is greater in New York, where 56 percent of the city's households don't even possess a car. Komanoff and Ketcham recommend that policymakers shift more of driving's costs to motorists by phasing in new annual levies on vehicles — perhaps \$750 per car and \$14,000 for each large truck. Such taxes would offer better equity, they argue, and provide an economic carrot for reducing both vehicles and travel.

Incremental auto insurance

Mohamed M. El-Gasseir of Rumla, Inc., in San Francisco offers another tack for discouraging unnecessary motoring: pay-as-you-drive insurance. For each gallon of gas purchased during the year, drivers would pay an additional, state-regulated, at-the-pump fee. Such payments — not a tax — would supplement fixed annual fees that drivers pay the insurer of their choice. Together, fixed and supplemental fees would be structured to average only what drivers now pay for coverage.

Under such a system, "practically everyone benefits," El-Gasseir says. Drivers pay only for the miles they travel. And because the gas-pump fees will reduce the number of uninsured drivers, he notes, insurance companies should be able to lower their fixed costs. Finally, by discouraging travel, the plan should cut traffic congestion and accidents. El-Gasseir cites a study by the state of California indicating that in the long run, this plan might cut gasoline use by 16 to 41 percent.

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contrary evidence that appeared in *PSYCHOPHARMACOLOGY*.

In fact, Spilich's data fly in the face of common sense. It is clear that smokers are not impaired in their complex thinking in everyday life. For example, Agatha Christie, Pablo Picasso, Molière, Richard Feynman, Johannes Brahms, Henry Ford, Orson Welles, Sigmund Freud, Jean Paul Sartre, Winston Churchill, Federico Fellini, Charlie Chaplin, Rudolph Nureyev, Helen Keller, Albert Einstein, Coco Chanel, and almost every sculptor and poet I can think of smoked.

All of these people have demonstrated complex thinking in their work. If Spilich is right, then it would have to be argued that they would have been even better thinkers as nonsmokers. That I find hard to accept.

David M. Warburton
Professor of Psychopharmacology
University of Reading
Reading, England

... there's debate

Warburton and Pritchard miss the points stressed in the original *BRITISH JOURNAL OF ADDICTION* article and in *SCIENCE NEWS*: (1) research that purports to investigate effects of smoking upon cognitive performance by comparing active with deprived smokers only measures deprivation effects; (2) research limited to simple, rapid, sensory motor tasks cannot generalize to overall cognitive performance; (3) tobacco lowers the available ceiling of performance — if task demands never reach this lowered ceiling, no appreciable deficit will appear.

Warburton responds that a "vast body of contrary evidence" exists. As I point out in the original article, studies that use nonsmoking controls or complex tasks provide a picture that disagrees with the view Warburton so hopefully espouses. The list of distinguished smokers proves nothing; their output without tobacco might have been quantitatively or qualitatively better.

Pritchard's first criticism is that my controlled smoking procedure is not like real smoking. I agree. Replication of the research using ad lib smoking procedures shows that as demands become heavier and the task less perceptual, cognitive performance of smokers still declines relative to deprived smokers and nonsmokers.

I was surprised by Dr. Pritchard's expert opinion (which directly contradicts Warburton's claims of intellectual enhancement) that "on average, smokers have lower IQs than nonsmokers," and I wonder how tobacco companies might work that into their advertisements. He claims correctly that the active smokers stayed at the driving simulator longer than deprived or nonsmokers, but since the analysis of vehicular collisions was expressed in terms of collisions per minute, his criticism is invalid.

If Pritchard's claim is correct — that preexisting personality differences (as opposed to tobacco use) account for smoking's effects — then why have he, Warburton, and their colleagues been so intent on studying the effects of tobacco?

George J. Spilich
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Chestertown, Md.

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