

Improving Safety for Older Motorists by Means of Information and Market Forces

DAVID E. KANOUSE

The RAND Corporation, Santa Monica, California

Older people have an increased risk of being killed in traffic accidents, both as vehicle occupants and pedestrians. Although they drive less than younger people, they have more accidents per mile traveled than younger adults who are over the age of 25. Much of this increased risk is directly attributable to changes in physical and cognitive abilities that lead to certain characteristic errors of judgment or failures of perception.

The special needs of older people and the special risks they face have not yet received much attention in the design of motor vehicles, highway environments, or licensing systems. However, because older adults are projected to account for an increasing share of the population well into the next century, mitigating these risks becomes all the more important.

This paper reviews research bearing on one strategy for reducing these risks, namely, providing older consumers with better information about their special needs and in particular with information about vehicular features that should improve safety. Such information could be beneficial in several ways. First, it could lead older drivers to make more frequent use of safety features and equipment already on their vehicles or available for retrofitting. Second, by influencing older consumers' purchase decisions, it could upgrade the average safety of the vehicles they drive—especially those features that most

closely address the special risks they face. Third, by enhancing older consumers' preferences for safety features relative to other product attributes, it could influence manufacturers' marketing, planning, and vehicle design decisions. This in turn could lead to improved vehicle safety or safety information for all consumers.

Just how likely is such a scenario, and what sorts of programs aimed at consumers are most likely to bring it about? In this paper the potential of consumer information to alter older people's vehicle purchase behavior is examined. The discussion draws from literature on consumer information processing and decision making, mass communication, persuasion and attitude change, and the characteristics of older adults as learners and consumers. It also draws on the results of a focused survey of existing programs aimed at reaching older people as consumers or motor vehicle drivers.

The main conclusions that emerge from this review are that (a) very little of the information that is now directed at consumers about automobiles focuses specially on safety features; (b) almost none of the safety-related information that does appear is directed at the special needs of older drivers; (c) such information, if disseminated widely and if suitably packaged, would very likely increase older drivers' awareness of these safety issues and of the fact that sound vehicle design affords protection; and (d) if such information were incorporated in driver retraining programs or otherwise effectively disseminated, it might well change some consumers' behavior in purchasing new automobiles or safety equipment for retrofitting to a currently owned automobile. If purchasing behavior were to change on a wide scale, it is plausible that it might encourage manufacturers to make or market their products differently, but no formal evidence is adduced to estimate how much alteration in consumers' behavior would be required.

The review begins by briefly describing the specific types of accidents for which older drivers are at elevated risk and the sensory, cognitive, and behavioral factors that contribute to those accidents. (For a more comprehensive treatment of the safety literature, see Volume 1, Chapter 3, of this report.) Next, the review describes several vehicle features that could play a role in reducing some of these age-specific risks. In a discussion of whether and when providing people with information has an effect on safety-related or preventive behavior, it is argued that change sometimes occurs but is likely only when careful thought has been given to how the information should be designed and presented. The potential effect of consumer demand on product supply is also reviewed.

The next section discusses various sources of information now available to consumers and describes existing programs that are designed to inform, educate, or retrain older drivers. Possible mechanisms for integrating information about vehicle safety features into these programs are discussed. This is

followed by a section on specific questions that might fruitfully be addressed by future research. A final section presents conclusions and discusses their policy implications.

SAFETY RISKS OF OLDER DRIVERS

As a group, older drivers generally have had good driving records. When the amount of driving they do is taken into account, however, older drivers have more accidents per vehicle mile. The types of accidents for which they are disproportionately at risk include those caused by making improper turns, failing to yield the right-of-way, and disregarding traffic signals (1-3). In contrast, they are less likely than younger drivers to cause accidents by speeding, driving recklessly, or driving while intoxicated.

The tasks that seem to pose special difficulties for older drivers—and that undoubtedly account for many of these age-specific driving risks—include changing lanes, passing, turning, noticing signs, and reacting appropriately to traffic conditions (4, 5). These problems in turn reflect the greater prevalence among older adults of functional impairments in certain key physical and mental abilities, including the loss of static and dynamic visual acuity, contraction of visual field, deterioration in dark adaptation, increase in glare sensitivity, increase in auditory threshold, and slower perception and reaction times (6-8). In addition, older drivers often suffer from reduced mobility of the neck and trunk, which can make it more difficult for them to maneuver quickly and to monitor traffic conditions to the sides and rear of their vehicles.

Panek et al. (9) identified three basic abilities that are important predictors of the frequency of involvement in automobile accidents:

- *Perceptual style*, or the ability to extract relevant information from a complex visual scene;
- *Selective attention*, or the ability to attend to a single message in the presence of competing messages;
- *Perceptual motor reaction time*, or the speed with which the person processes incoming information and responds to it.

These variables do, in fact, correlate with drivers' accident records (10) and may help explain older drivers' occasional failure to respond to signs and signals and the greater difficulty they seem to have in reacting to complex or rapidly changing traffic situations.

IMPORTANT VEHICLE SAFETY FEATURES

No attempt is made here to list all the vehicle design features that may result in increased safety for consumers. A few examples, however, provide a

specific context for discussing how relevant information might be packaged and how existing programs might be improved. The following examples were among those that members of an expert panel recently named as especially relevant to the needs and problems of older drivers (11).

Safety Belts and Passive Restraints

Although important for all drivers, safety belts are especially important for older drivers because of their greater susceptibility to injury. Improved design of shoulder belts should be possible. In addition, older drivers might especially benefit from the design of belts that are more easily reached, fastened, and released. Survey results suggest that older drivers are twice as likely as younger drivers to report that they have trouble reaching their safety belts (22 percent versus 10 percent) and are also more likely to report this as a reason for not using belts (11). Automatic safety belts may therefore be especially advantageous for older drivers who have difficulty buckling and unbuckling. Air bags are similar in offering automatic protection, though only to front-seat occupants in a frontal crash. Because older drivers are at greater risk of injury in a crash of given severity, the additional protection afforded by a combination of safety belts and air bags should be especially valuable for them.

Mirrors

Because older people experience greater difficulty turning to check on blind spots, they stand to gain especially from mirrors with improved design and placement (interior and exterior). These are available but not as widely marketed or purchased as they might be.

A-Pillar Design

For similar reasons, older drivers have greater difficulty compensating for blind spots caused by placement and size of supporting A pillars at the corners of the vehicle.

Windshield Wipers

Lateral visibility can be heightened by increasing the width of the sweep. Visibility in the lateral areas of the windshield is important to safety when making turns. Older drivers are especially likely to have accidents while turning.

Power Steering and Power Brakes

Power steering and power brakes provide assistance to drivers with less than average strength, helping them control the vehicle safely. In addition, power brakes permit left-foot braking, which enables the driver to achieve shorter stopping distances.

Antilock Brake System

Antilock brakes prevent the wheels from locking so that the driver loses the ability to steer during an emergency. (Such an emergency may be a more serious problem for older drivers, who often show less ability to react quickly in these situations than younger drivers.) Such a braking system is now available only on imported cars and is quite expensive. If it could be made available on higher-volume domestic models and if consumers were willing to pay for it, the cost would come down considerably.

Instrument Panel Design

Simplicity of design, accessibility of controls, and legibility are probably especially important for older drivers, who may have special difficulty in quickly locating the important part of a complex visual display.

Seat Design

Older drivers have weakened musculature and less flexibility in their spines and are therefore apt to become uncomfortable sitting in most automobile seats for even moderate periods of time. This problem could be reduced by designing seats with less padding and more support for the lumbar region. Improved lateral support would also be helpful. Seats that are designed to prevent too much forward and downward movement of the buttocks on collision would reduce the risk of injury. Bench seats are preferable to bucket seats.

Vehicle Size

Accidents involving small vehicles are much more likely to result in fatalities or serious injuries. This is true even in single-vehicle collisions and when two vehicles of equal weight collide (12). For that reason, all consumers are safer driving medium-sized or large vehicles than small ones. Because older drivers are the most vulnerable, they stand to gain most from the protection afforded by larger and heavier vehicles.

High-Mounted Brake Lights

Features that make a vehicle more conspicuous or that visibly signal its driver's intentions and encourage other drivers to keep a safe distance reduce the likelihood of rear-end collisions. High-mounted brake lights, sometimes referred to as collision-avoidance lights, do all of these things. They may therefore be an especially important safety feature for older drivers, who sometimes drive at slower speeds than the surrounding traffic and are thus at increased risk of being struck from the rear.

The safety features listed above vary widely on a number of dimensions. Some are expensive, others inexpensive. Some are now available on all vehicles (but in designs that vary widely in safety); others are unavailable on most or all vehicles. Some anticipate advances in safety engineering that should soon be made; others merely require the widespread adoption of designs that have already been implemented in passenger vehicles. Some require active consumer cooperation if they are to be used successfully; others are part of the structural characteristics of the vehicle and require nothing of the driver beyond purchase of a vehicle that is equipped with them. Variations along these and other dimensions can be quite important in determining how readily consumers will seek out or accept these features and what sort of information will make that more likely.

EFFECT OF INFORMATION ON CONSUMER DEMAND FOR SAFETY FEATURES

An important issue is whether information affects consumer demand for safety features, because some research studies suggest, on the face of it, that there is no effect. If research has established that efforts to improve consumer safety by informing them about safety features are unlikely to work, then a serious review of whether it makes sense to pour resources into this approach should be made. This issue is addressed in a later section of this paper.

As it happens, there are good reasons to be optimistic despite the existence of seemingly negative findings. Most of the negative findings have emerged from studies evaluating information campaigns designed to educate consumers into better health or safety habits. All too often, rigorous evaluation yields no apparent effect on behavior (13-15). For example, Robertson and colleagues conducted a controlled evaluation of the effects of a television campaign to increase seat belt use; they found no effects (16). Although this study is frequently cited to support the contention that it is difficult or impossible to change safety behavior through the use of mass media, that is probably far too strong a conclusion. In fact, the study provides little evidence on what effects the message had, or why. No process measures were obtained,

nor is there much evidence that would allow the determination of the quality of the messages used, which is important in determining whether they should have had an effect. (Poorly designed messages tell little about the capacity of well-designed messages to influence behavior.)

Similar points could be made about most other studies that have yielded negative findings. Most often, either the campaign itself or the measure of its outcome is too flawed to permit determination of where failure occurred or what the results might mean for well-designed campaigns.

On the positive side, there have been successful information campaigns that have produced long-term changes in consumer health or safety-related consumption patterns. A prominent example is the Stanford Heart Disease Prevention Program's Three Community Study, sponsored by the National Heart, Lung, and Blood Institute (17, 18). This program relied on community education through the mass media to change knowledge and behavior related to cardiovascular risk (smoking, exercise, and diet). In one community, a mass media campaign was the only intervention. In a second community, the intervention was supplemented with intensive face-to-face instruction of high-risk individuals. A third community served as a control group.

Results showed significant improvements in physiological measures of risk (e.g., blood pressure) in each of the communities where the intervention was conducted. Risk in the control community increased during the same time period.

This study, along with other all-too-rare examples (19–21), suggests that it is possible to make worthwhile changes in people's health and safety habits through the use of well-designed information interventions. On the other hand, the existence of numerous failures should make the phrase "well-designed" a necessary qualification. Efforts to simply put information "out there" and hope people will attend to it, grasp its potential relevance, and change their lives as a result are doomed in the main to fail.

EFFECT OF CONSUMER DEMAND ON PRODUCT SUPPLY

A second important issue is whether a change in consumer demand in response to information is likely to be of sufficient magnitude to induce a supply response. Consider the following positive scenario for change mediated by market forces. Safety feature X, not currently supplied by most manufacturers because of insufficient demand and high unit production costs, is prominently featured in a safety information campaign. Consumers become interested and begin inquiring in dealer showrooms about this feature's availability, even on midpriced and lower-priced models. Meanwhile, a small retrofit market begins to grow quite rapidly. Manufacturers respond by

increasing production, and decreases in unit production costs are passed on to consumers in lower prices, stimulating further demand. Eventually, supply and demand reach a new equilibrium, but at a much higher level than before the boost in demand provided by the information campaign.

How likely is such a scenario, and what are the conditions that facilitate or impede its occurrence? Not surprisingly, the answers to these questions depend on many factors, including the structure of the market and "location" of the segment providing increased demand; the price elasticity of demand, both by the older driver and other potential purchasers; the initial cost to the manufacturer of making the safety feature; the marginal cost of making and installing additional units (the supply curve); and the time required to respond. An economic perspective suggests that increased consumer demand will produce a supply response only when the demand can be met at a price that the consumer is actually willing to pay and when supplying the demand is on balance profitable or otherwise beneficial to the manufacturer.

Thus, increased demand will not always produce a supply response. One of the most common reasons is that a substantial initial investment may be required to supply the demand. There are other reasons as well, however. If a manufacturer makes an undifferentiated product line, for example, it is possible that supplying a demand on the part of some consumers can increase prices sufficiently to suppress demand by other consumers. In such a case, manufacturers can actually lose market share by responding to the demand. A similar problem can occur in marketing a product. Unless the feature to be marketed offers a good fit with the overall image of the product line, the manufacturer's marketing department may be reluctant to call the consumer's attention to it. Thus, much could depend on the extent to which consumer preferences vary in a way that creates conflicting demand. This is in turn related to the issue of product differentiation. If manufacturers can respond to demand by creating a special product line aimed at that particular market, they may be more likely to respond than if they must take the substantially greater risk of altering their entire product line.

In analyzing the process by which a supply response may occur, it is also useful to distinguish a marketing response from a design or engineering response. The former may occur much more quickly than the latter, given the length of the product design cycle. Changes in marketing may be substantive (reallocating available products to different markets) or nonsubstantive (putting more emphasis on safety features in advertising campaigns). Even nonsubstantive changes, however, may have important long-term effects. If a manufacturer changes its advertising in response to a perceived shift in consumer concerns, this change can contribute further to the shift to which it is responding, in a positive feedback loop. Moreover, any *sustained* change in basic consumer concerns, such as an increased concern for safety features

vis-à-vis other attributes such as performance or fuel economy, is almost certain to influence design decisions in the long term.

One important factor influencing the likelihood of a supply response is the extent to which the safety feature can be economically offered for retrofit or as an optional feature on a new car purchase, or whether it can only be offered as a standard design feature on a new vehicle. Products that can be offered to the retrofit market have a greater potential supply response because of the greater potential demand. Similarly, features that can be offered selectively only to those who want them will tend to have much stronger supply-demand elasticities than those that must be bundled with a complex set of other features.

The safety features that could benefit older drivers vary considerably in several of the aspects previously described, including the initial costs to the manufacturer of providing them, their likely retail cost, the extent to which they are apt to appeal to a wide range of consumers in addition to the older driver, and whether they can be provided at reasonable cost for retrofitting. Some devices, such as well-designed rearview mirrors and high-mounted brake lights, would appear to be good candidates for supply response to increased demand by consumers but are (possibly for that reason) generally available already. Others, such as improved seat and A-pillar design, are less likely candidates for some of the reasons mentioned previously.

To the extent that other conditions make a supply response possible, older drivers constitute a particularly favorable source of demand. As a group, they are more affluent than younger consumers and more likely to make repeat purchases if they are satisfied with a product. Moreover, the fact that they form an increasingly large share of the population makes them an attractive market for future growth, even beyond the attractiveness dictated by their current numbers. For these reasons, a shift in consumer preferences among older consumers could have a disproportionate influence on producers' design and marketing decisions.

It should be recognized that manufacturers have other incentives besides profit and market share for developing and marketing features that improve vehicle safety. One such incentive is product liability. Any device that reduces the number or seriousness, or both, of injury accidents, especially those that can be attributed to design limitations or manufacturing faults in the vehicle, thereby has some attraction for manufacturers as well as consumers. Publicity campaigns that disseminate information to consumers about the state of the art in vehicle safety capabilities do not, of course, raise that standard; they may, however, hasten the process whereby improvements in design are adopted as the current standard used for judging whether a design is adequate.

SUCCESSFUL INFORMATION CAMPAIGNS

A thorough review of behavioral science principles that are applicable to the design of successful information campaigns is beyond the scope of this paper.

Suffice it to say that a vast body of theoretical and empirical knowledge has accumulated, much of it quite usefully addressing this question (22, 23). A few important examples that seem especially applicable to the issues addressed in this paper follow.

1. *Information will have the greatest influence when it specifically addresses the audience's needs.* This may seem obvious, but all too frequently communicators present the target audience with information that the communicator finds relevant (or simply has available) rather than putting it in a form that is useful for the audience (24, 25). This has been an especially frequent problem in information disclosures mandated by consumer protection legislation.

2. *Audiences seldom change their behavior in response to information they already have.* Again, it is surprising how often communicators' campaigns are designed to change a target audience's behavior by telling the audience what it already knows. That is one reason why antismoking campaigns that try to change smokers' behavior by telling them that smoking is dangerous have seldom worked. Smokers already know that smoking is dangerous; ignorance is not the barrier to change.

3. *Information campaigns work best if they take advantage of the audience's existing motivation (that is, give people information that helps them do what they already want to do).* Nearly always, this requires preliminary work to explore the target audience's existing beliefs, values, and goals. Many older drivers, for example, may be aware that they experience difficulties that affect their driving safety and may also be quite concerned about it. If so, they may be quite responsive to messages that give them some constructive way of handling this situation.

4. *People are likely to respond more favorably to information that empowers them than to information that makes them feel powerless.* A persistent problem for those who design programs aimed at encouraging consumer safety or prevention practice is that information that emphasizes a danger may produce avoidance rather than coping responses. Although the social and psychological studies of this problem suggest that people's responses in these situations are complex, one way to increase the probability that a coping response will occur is to emphasize what can be done to control or eliminate the danger (26, 27).

5. *Communications will have more influence on behavior if they contain information that is relevant to decisions.* Often, the information presented in a communication seems designed to maximize the recipient's understanding of the topic rather than to be most useful to the decisions the recipient must make (24). If a communication is to improve people's decisions, it must emphasize those facts or other aspects of the problem to which people's decisions are most sensitive.

6. *People are more likely to use information if it is provided to them in a way that takes into account how and when they will use it.* For example, consumers seldom use the nutrition information on food labels (28) even though they overwhelmingly endorse the regulation requiring it (29). One reason may be that the information is displayed on each individual product rather than by product class, so that comparison is difficult (30). Timing can be important. Information is most likely to have an effect on people's decisions if it is made available to them while they are in the process of making a decision, rather than before they contemplate one or just after they have made it. Again, this may seem obvious, but a good deal of consumer product information reaches consumers only after they have made a purchase decision. For automobile safety features, information made available at the point of purchase is likely to reach many consumers in time to affect their choice of model or features.

7. *Information can have an especially strong effect on behavior when it induces a change in mind set or leads people to reframe the way they think about alternatives (31).* For example, many consumers consider themselves to be in the market for purchasing an automobile only during certain limited times, when they think they need one or for some other reason the time seems right. The rest of the time, such consumers consider themselves to be out of the market and are apt to pay much less attention to new information that would be relevant if they were planning a purchase. In such a circumstance, information that leads consumers to reconsider whether they should replace their current vehicle may be especially effective. Similarly, many consumers, when purchasing a replacement automobile, exhibit what Howard (32) has called "routinized response behavior"—automatic repurchase of a previously chosen alternative, in this case, a vehicle of the same size, type, equipment, and make as the one they previously owned. The routinized nature of the response is apparent not so much from the repetition of a previous choice as from the absence of any consideration of alternatives. An informational intervention that induces consumers who would normally make a routinized choice to make an active and considered one instead could have important effects on behavior.

8. *Large-scale educational efforts are most likely to reach people when they are presented on a sustained basis through multiple channels and are reinforced at the community level.* Research on the diffusion process (33) offers important insights into the processes of social change. Perhaps most important, it suggests that the longer-term effects of an informational intervention can be far greater than the measurable short-term effects. Although initially a media campaign promoting safety may change the behavior of only a few people, social modeling can greatly multiply this effect. Moreover, a sustained campaign of educational messages can eventually change many of those who were resistant during the early stages (34).

If there is a common theme to the foregoing principles, it is that designing an effective strategy for informing consumers—one that stands a good chance of facilitating appropriate changes in their behavior—requires careful thought and planning and often formal or informal research. It requires careful analysis of why consumers now behave the way they do, what they know, and what they want. It requires analysis of the context surrounding the behavior one is trying to affect. Finally, it requires considering these issues separately for different behaviors (e.g., purchase versus use of a safety item) and for different types of consumers, because the answers will often be quite different from one type of product to another and one type of consumer to another.

SOURCES OF CONSUMER INFORMATION FOR OLDER ADULTS

With this general perspective, an examination of the channels and specific sources through which older consumers now get information is made, focusing especially on agencies, organizations, and programs that devote at least some attention to automotive safety, or that could be led to do so.

Mass Media

Like most Americans, older adults spend a considerable amount of their time watching television—more, indeed, than younger adults, at least until age 70 (35–37). Some researchers believe that television has substantial effects on older people's values (38), although there is by no means universal agreement on this.

Only in the last 15 to 20 years have marketers begun to target elderly consumers as an attractive market segment (39). Still, the automobile industry does not yet seem to have targeted older consumers for special mass advertising, although they are to some extent taken into account indirectly in the demographic profiling of markets for different lines of automotive products.

The mass media and especially television are widely believed to serve an “agenda-setting” function (40), determining not so much what viewers think as what they think about. If so, television advertising and public service announcements could enhance consumer awareness of vehicle safety issues generally, quite apart from the role they might play in conveying more specific information.

In considering the potential for a television or radio-based campaign to reach older consumers, however, it is well to keep two things in mind.

First, there is as yet little evidence that public service announcements are an effective way to produce behavioral change for anyone (22); and second, the frequent practice of broadcasting public service announcements very late at

night means that many older viewers, who tend to watch earlier in the day, never see them.

Consumer-Oriented Magazines

Both of the two most popular consumer-oriented magazines, *Consumer Reports* and *Consumers' Research*, cover issues of safe vehicle design. *Consumer Reports* usually addresses safety features in the context of an overall assessment of a vehicle (or, more often, group of vehicles). That is, information on safety features is mentioned along with information on performance, fuel economy, comfort, and styling. In recent years, the magazine has published few articles specifically focused on vehicle safety, neither has it separately addressed the needs of older drivers.

Consumers' Research, in contrast, has published several articles and shorter items on vehicle safety issues. In particular, it has provided continuing coverage of developments in air bags. This is in keeping with the magazine's general emphasis on health and safety issues. It has not, however, focused on older drivers.

The Car Book, by Jack Gillis (41), an annual guide to automobile purchase that covers over 600 cars, places a strong emphasis on safety information. It devotes an entire chapter to safety, including a summary of the U.S. Department of Transportation crash test performance results that includes not only overall index numbers but also separate ratings for driver and passenger protection, windshield retention, windshield passenger protection, and fuel leakage. The book also contains a discussion of various aspects of automotive safety, including doors, windshields, safety belts, and child safety seats. Buying tips are offered, though not on every feature. There is an extended discussion of how to buy a child safety seat. The special problems of older drivers do not receive separate attention.

Government Programs

Federal

The National Highway Traffic Safety Administration (NHTSA) has brochures and other materials on automobile safety features, although none are specifically directed at older drivers. These materials include leaflets on air bags and other automatic protection devices, a booklet on collision and the role of safety belts in reducing the risk of injury, a booklet summarizing crash test results for recent models under NHTSA's New Car Assessment Program, a handbook of instructions for complying with regulations that pertain to imported motor vehicles, and a leaflet on child safety.

It may be worth noting that NHTSA apparently has no capability of filling topically oriented requests from consumers; specific titles must be requested.

This obviously limits the usefulness of NHTSA's information services in situations in which the person handling the request is not completely familiar with the materials that are available.

State

Nineteen states and the District of Columbia have proposed or passed legislation requiring insurance companies to provide discounts to drivers 55 and over who complete a driver retraining program. Most states approve retraining courses developed by national organizations like American Automobile Association (AAA), American Association of Retired Persons (AARP), and the National Safety Council, but some (e.g., Washington) have also developed their own curriculum and training programs. These state-level programs might be willing to adopt (or adapt) model materials developed for multistate use.

Institute and Foundation-Supported Efforts

The Insurance Institute for Highway Safety (IIHS) and the Highway Loss Data Institute (HLDI) maintain bibliographic information on a wide range of topics concerned with automobile safety. In 1984 IIHS published *The Injury Fact Book* (42), a comprehensive analysis of statistical patterns of injuries that draws on data from a wide variety of sources.

In September 1986 IIHS published a one-page fact sheet on crash deaths and injuries among elderly drivers. The fact sheet summarizes statistics on excess risks for older people. An earlier status report, published in April 1984, also covered age-related patterns in injuries and fatalities extracted from *The Injury Fact Book*.

IIHS provides vehicle crash safety information free of charge and frequently announces the availability of this information. Dissemination is limited to those who request it, however.

Organizations for Older People

Neither the National Council on Senior Citizens nor the National Council on the Aging conducts any programs concerned with the older driver.

AARP developed and runs the 55 Alive/Mature Driving course, which is offered nationwide and is open to anyone 50 or older. AARP provides the program, materials, and instruction through a network of trained volunteers, who work in community centers, churches, and senior citizens centers. The course consists of 8 hr of classroom instruction divided into two half-day sessions that together cover six segments: overview, physical changes, interacting with traffic (two segments), accident prevention and adverse driving

conditions, and perception and course wrap up. Automobile maintenance receives extensive treatment in the segment on accident prevention, but safety features and factors to consider in purchasing an automobile do not. A list of vision safety tips includes three suggestions that implicate purchase behavior: "Replace windshields that are badly scratched or deteriorated. Avoid heavily tinted windshields as they reduce the amount of light you need to see. . . . You may wish to use a curved or 'convex' mirror." Otherwise, the emphasis is primarily on reducing risk through one's actions as a driver.

The instructional approach emphasizes active participation in the learning process and discussion with peers. In keeping with those concepts, the course is conducted by volunteers 50 and older who are recruited and trained by AARP from among its members. Volunteers receive preinstruction training in how to conduct discussion groups, followed by supervised practice teaching. Once trained, they receive ongoing supervision supplemented by participation in annual in-service training workshops. Instructors are responsible for recruiting their own students and finding rent-free facilities in which to hold the course.

The entire program is administered by 10 field coordinators and 50 state coordinators plus a District of Columbia coordinator, who are assisted by 320 assistant state coordinators, each of whom is responsible for a particular geographical area. Coordinators at all levels volunteer their time but are reimbursed for out-of-pocket expenses.

In 1986 AARP's 55 Alive program graduated 126,000 students. Discussions with assistant state-level coordinators suggest that the potential market for the course may be much larger than that. Relatively little advertising is done, yet there can be long waiting lists at the state level. A more intensive marketing and coordination system along with an increase in the size of the volunteer force of instructors might produce a much larger crop of graduates.

AARP also publishes *Modern Maturity*, a bimonthly magazine containing articles of interest to older citizens. With a circulation of 23 million (AARP's current membership), this magazine offers an extremely attractive channel for reaching older drivers with vehicle safety information.

American Automobile Association

AAA offers one of three driver retraining courses in the national market—Safe Driving for Mature Operators—available in 20 states and the District of Columbia. Like AARP's course, AAA's comprises 8 hr of instruction, in keeping with the requirements of most states that mandate insurance discounts.

AAA has 167 clubs in the United States and Canada; 45 to 50 of them are active in the mature driver program. Nothing firm is available on the number

of drivers whom the program has reached or the number to whom it is available. AAA has 26 million members, however, so the number of older drivers to whom the program is available is obviously quite large.

States differ in their approaches to licensing. Some maintain state control of retraining programs; others license commercial operators who are trained or certified, or both, by the state. In the latter case, AAA decides at the state level whether to market its course directly to the public, hire trained instructors to teach it, or market it through commercial agencies.

Each club operates autonomously but may seek assistance from national headquarters. Fees are set by the clubs for the courses they offer. Advertising approaches also vary depending on state regulations and local club policy. In general, the programs are advertised by word of mouth. *Clubways* magazine usually contains a brief notice concerning the availability of the course and the laws pertaining to insurance discounts.

The club offers its own course directly to the public in 13 states. All of these states report that the course is fully subscribed, with waiting lists. Given the relatively low level of advertising, this suggests that there may be a substantial untapped demand for this sort of training.

The course is organized around eight topics: Introduction (how age affects driving), Seeing, Communicating, Adjusting Speed, Margin of Safety, Driving Emergencies, Your Car, and You the Driver. The Your Car section is written from a preventive maintenance standpoint rather than from that of a prospective purchaser. The back of the course manual, however, contains advertisements for driver aids, some of which are safety oriented (e.g., mirrors and collision avoidance lights) and all of which are available for purchase from AAA. These aids are described in language that suggests a marketing rather than an educational perspective.

In addition to the mature driver course, AAA distributes two other sets of materials oriented toward the older driver. The first is a Public Affairs Committee pamphlet entitled "The Older Person's Guide to Safe Driving," prepared by a freelance writer partly on the basis of the report *Needs and Problems of Older Drivers* (11). The 25-page pamphlet is unusual in that it contains more than a page of information on safety considerations in buying a new car. Topics covered include size of vehicle, power brakes and power steering, cruise control, clear (untinted) windows, seats, and mirrors. In a separate section the pamphlet covers safety belts and air bags, suggesting that "as air bags become perfected and available, drivers may want to purchase them as optional safety equipment."

Through its Foundation for Traffic Safety, AAA has also recently sponsored the development of a "Test Your Own Performance" booklet aimed at older drivers. This attractively designed booklet contains a 15-item self-rating form that older drivers can use to score their own performance on safe driving

practices. This is followed by a discussion of answers and what they mean. Discussion includes presentation of the pertinent facts (for example, that older drivers often fail to look to the rear) followed by a set of suggestions (for example, drivers with arthritis pain or stiffness that make it difficult for them to look to the rear are encouraged to install a wide-angle rearview mirror inside the vehicle and a right-side mirror on the outside).

The discussion section of this form contains many specific suggestions on ways to improve safety through the purchase of equipment. These suggestions are woven throughout the discussion rather than drawn together in a single place. The document is organized by problem area (driving habits, physical condition, etc.), so that it is appropriate for each suggestion to accompany the problem it is intended to address.

This booklet has many strong design characteristics, including its clear organization and presentation, attractive format, and large type. One of its greatest strengths, however, is the self-rating form, which serves to get older drivers personally involved in the material at the outset.

This booklet has only recently become available, so it is too soon to tell how widely it is being distributed and how favorably it is being received. Nevertheless, it seems to have the potential for widespread and effective use.

National Safety Council

The National Safety Council markets a driver retraining course nationwide. Called *Coaching the Mature Driver*, the course consists of an 8-hr curriculum that includes two 16-mm films, six narrated slide shows, an additional slide program designed for group participation, and a booklet used to test driver recall. Topics covered include how to compensate for changes in vision, hearing, flexibility, and reaction time; road sign recognition; and safety belts. The curriculum does not cover the purchase of vehicle safety features to help mitigate risks for mature drivers.

The course materials are sold outright by the National Safety Council to agencies that it trains; agencies in turn train instructors to use the materials. The curriculum may also be offered by public training agencies throughout the world that have been certified by the National Safety Council.

Because of the agency arrangement through which the course is offered, statistics on the number of older drivers who take the course annually are unavailable on a national basis.

IMPROVING DISSEMINATION OF INFORMATION ABOUT SAFETY FEATURES

The review of various sources of information currently available to older drivers and consumers makes it clear that few of these sources provide any

coverage of vehicle safety features from the standpoint of possible purchase as opposed to use or maintenance. To a large extent, this reflects the somewhat arbitrary distinction between the older driver-vehicle owner and the older consumer-vehicle purchaser. Driving requires one set of skills, purchasing another. The interrelationship between the two in affecting vehicle and driver safety is easily overlooked.

Fortunately, because the driver-consumer distinction arises from semantic disassociation of these categories, it can be overcome. The recently developed AAA self-rating form is an example of how the problems of the older driver can be discussed in a way that considers both improved driving skills and improved vehicle safety features as solutions to these problems.

Driver Retraining Courses

It should be possible to include more information on vehicle safety features and the older driver in driver retraining courses without making major changes in the course structure or content. One reason for this is that the courses have been designed in modular fashion to accommodate differing state content requirements. Another is that the relevance of this material has already been established by the common emphasis on the special problems of older drivers; thus, no special motivating explanation is needed.

Driver retraining courses offer an attractive means for disseminating this type of information for a number of reasons. First, these courses appear to reach large numbers of older drivers and promise to reach more in the future. There appears to be untapped demand even in the states where they are offered, and the demand will grow as other states adopt similar legislation mandating insurance discounts for older driver retraining and as marketing efforts improve. Second, many or most of the drivers reached may be motivated by genuine concern for improving their own safety and that of others as much as or more than by the insurance discount they receive. (There appear to be no survey data on this as yet, but local coordinators for AARP and AAA programs report high levels of motivation.) Third, the course offers an intensive setting in which to introduce the materials under conditions of high involvement and high attention.

Assuming that it is a good idea to encourage adoption of additional vehicle safety information in driver retraining courses, how might that best be accomplished? One approach might be to develop prototypical materials (e.g., a booklet) on the purchase of vehicle safety equipment from the standpoint of the older driver, prepared in a way that would ensure their compatibility with one or more existing older driver retraining courses. Such a strategy would make it easy for a course to adopt these materials for supplemental use. Integration of the materials into the body of the course would require further steps.

A booklet on the purchase of vehicle safety equipment aimed at older drivers would have the further advantage of being usable as a "stand-alone" document to be disseminated in other ways—through senior citizens' groups, for example.

A second approach might be to encourage states that are contemplating new or revised legislation mandating insurance discounts for retrained older drivers to consider requiring coverage of vehicle safety equipment for state approval. Many states are reluctant, however, to specify too rigidly what must be covered, and some may see the purchase (as opposed to the use or maintenance) of safety equipment as somewhat peripheral to the content of a *driver* retraining course.

Mass Media

The broadcast media offer an attractive channel for increasing public awareness of issues; they offer less promise as ways of conveying specific content. Depending on what older drivers already know or believe, broadcast media campaigns might be considered for the purpose of increasing the salience of vehicle safety design as a factor to consider in purchasing a vehicle. The broadcast media may also be useful in directing older people to specific sources of information (e.g., crash safety test results) or alerting them to the existence of the retraining courses.

The print media on the whole appear to be better suited than the broadcast media for conveying detailed information (23). This suggests a natural division of function in an information campaign: use of the broadcast media to heighten awareness of an issue and to let people know that specific programs or sources of information exist; use of the print media (magazines, books, booklets) to convey detailed information in a form that facilitates greater depth of understanding and also makes it easier to retrieve information.

SPECIFIC QUESTIONS FOR RESEARCH

The design of effective information dissemination campaigns stands to gain a good deal from focused research on older drivers' knowledge, attitudes, and behavior. It would be extremely interesting to know, for example, how many older drivers already consider themselves to be at increased risk for traffic accidents and, if so, how accurately they perceive their strengths and weaknesses as older drivers. Some information on this question can be gleaned from the results of a recent survey of older drivers (11), but much more needs to be learned. It is possible that many of the older persons who give up driving do so out of safety concerns. Some of these drivers may experience significant impairment; others may mistakenly believe that their physical competency no

longer permits them to drive safely. Learning about how older drivers make these judgments and how accurate they are could help the design of useful information interventions. It may also help in efforts to motivate older drivers who could use additional instruction or training to seek it out.

Although much has been learned in recent years about cognitive, perceptual, and physical changes that accompany aging, and although we are beginning to have a good idea of how these changes affect older people's driving skills, there is still much to be learned about how specific training programs can best help to overcome these deficits. The techniques used in most of these programs have for the most part been chosen because they make sense; studies that seek to determine how effective they actually are have been rare.

More research is also needed on older people as consumers of automotive products. What considerations govern their purchase decisions? How do they evaluate automobile safety and how is that evaluation factored into their overall evaluation of a vehicle? How many older people automatically repurchase a previously owned make without giving much consideration to alternatives? How many scale down their minimum requirements for a vehicle (including safety requirements) as a result of their reduced mileage? Answers to these questions and others like them would help to better pinpoint older persons' information needs.

CONCLUSIONS AND RECOMMENDATIONS

The social science literature shows that it is rather easy to design informational campaigns that have no discernible influence on people's health- or safety-related behavior. The existence of successful (and usually carefully planned) campaigns, however, suggests that a properly designed campaign, aimed in an appropriate way at the right target audience, and providing them with new and useful information that is relevant to their concerns (and not just those of the people who designed the campaign), can succeed in changing behavior. There is also ample evidence that media campaigns can succeed quite readily at enhancing people's awareness of an issue. This last point may be quite important when it comes to the special needs of older drivers, because unlike many problems involving public safety, the facts have not been widely aired and debated in public forums. Thus, there is ample room for awareness to grow.

If information can be used successfully to induce a change in consumer demand, is this likely to lead to a supply response? Empirical evidence is mostly lacking, but analysis suggests that several factors will determine the answer—which may therefore depend on the particular technology involved. In the most unfavorable cases, making a safety feature available may require a major capital or other initial investment by the manufacturer, the feature may

have to be integrated into the design of the overall product line, the marginal cost to the consumer may exceed the utility for most consumers, or product differentiation may not be an option. In the most favorable cases, of course, the reverse of these conditions would hold. It is worth noting, however, that producers may have other incentives to upgrade the safety of their products, including a desire to avoid product liability and to avoid future regulatory requirements. If these incentives are present, a marginal increase in consumer demand that would not in terms of short-run profitability justify a decision to supply the market may instead be viewed as an attractive opportunity to pursue longer-term goals. It was noted earlier that demographic trends make the pursuit of the future older-driver market more attractive than it might be if considered only on the basis of its current size. These considerations all lead to the conclusion that changes in patterns of consumer demand among older drivers could affect manufacturers' decisions.

With this in mind, we return to the question of how likely it is that any reasonably scaled information campaign would induce more than a minor shift in consumer demand. Or, to put it another way, what would be required to induce a more than minor shift that is capable of being sustained? Such a change would most likely require a sustained campaign aimed at increasing awareness of particular safety issues for older drivers, and this would have to occur *in the presence of* receptivity to that sort of increased awareness. What this means is that no campaign, no matter how cleverly constructed, could succeed for very long in getting older drivers to think more about their safety needs unless that is what they think they ought or want to be doing. Nonetheless, a well-designed campaign can speed up a process of change that is culturally consistent with other trends in that population. Do these conditions exist? Perhaps—one would need to gather data (or review the data currently available) to make an educated guess. If such data showed that older drivers are receptive to this kind of information, this would offer a basis for judging that a well-designed campaign might in time produce a major increase in awareness that could in turn affect purchase behavior. In the absence of such receptivity, a communication campaign undertaken to induce changes in demand sufficient to alter market forces would probably be a waste of time.

Most of the existing informational programs aimed at older drivers do not reach enough of them to have a noticeable effect on aggregate demand. These programs can be justified on other grounds, however. The purchase of safer automotive equipment is only one of several ways that older drivers can improve their safety and mobility and is not necessarily the most important. Improvement in relevant skills and better knowledge for prevention (e.g., knowing what driving situations to avoid) are obvious alternatives.

Several specific recommendations follow from these conclusions and the earlier discussion:

- Older drivers would benefit from good consumer-oriented printed materials on how to make automobile purchase decisions that take their special needs into account. The search period preceding purchase is when consumers are likely to be especially receptive to printed information, and few existing materials fill this need.

- NHTSA and automobile manufacturers should be encouraged to develop and disseminate safety information aimed specifically at older drivers.

- Manufacturers may find the dissemination of safety information to be a useful and effective marketing strategy in reaching the older-driver market. They should be encouraged to explore this approach. Effective dissemination is likely to require the cooperation of the National Automobile Dealers Association; this should also be strongly encouraged.

- States that have developed curricula for driver retraining programs and states that might wish to use them should consider pooling their resources to develop and evaluate materials for multistate use.

- Driver retraining programs probably have a larger potential market than they have so far reached. By marketing such programs more extensively and training more instructors to teach them, it may be possible to expand their influence.

- There is a need to assess the potential of a sustained media campaign for promoting awareness among older drivers (and their families) of their particular safety needs. The goal would be not to characterize the present state of awareness (that has been done) but to assess how older drivers' awareness and behavior might be changed. Such a study might not have to be on a large scale; the use of focus groups could be considered.

- Instructional and training programs should be evaluated more carefully to learn which aspects work and which do not. Experimental studies that compare two or more variations on a given approach may prove more informative in this respect than comparison between a single-treatment group and an uninstructed control group. Better measures are needed of how instruction affects actual driving performance.

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