trist and taking medicine as prescribed were significant when analyzed separately, these failed to reach significance when analyzed in combination (0.063); the writers concluded that with certain specific patients taking medicine is more important to their well-being, while to others the psychiatric session holds more importance; always adhering to both is not a double insurance for favorable outcome.

A comparison group of 24 discharged chronic schizophrenic patients, randomly selected retrospectively from the same time period as covered by the above experimental group, was studied through use of a similar questionnaire. The major difference in the two groups was that the experimental group had rigidly structured psychiatric and social work follow-up and the comparison group had no specifically planned follow-up. Rehospitalization records were substantially better for the experimental than the comparison group, thus adding weight to the earlier findings that carefully structured psychosocial treatment is a necessary part of successful community follow-up.

Dr. Klein is Assistant Professor of Psychiatry (Social Work) and Ms. Person is research specialist at the Missouri Institute of Psychiatry, School of Medicine, University of Missouri—Columbia, St. Louis, Missouri 63139. Dr. Itil was formerly Professor of Psychiatry, Associate Chairman (Academic Research), and Chief of the Psychopharmacology Section at the Missouri Institute of Psychiatry and is presently Research Professor and Director, Division of Biological Psychiatry, Flower and Fifth Avenue Hospitals, New York Medical College, New York, New York 10029. Mr. Marchbank is SFI Planning Specialist, Bureau of Supplemental Security Income, Social Security Administration—Kansas City, Missouri 64108, U.S. Department of Health, Education, and Welfare.

The Buzzer-Light Reminder System and Safety Belt Use

LEON S. ROBERTSON, PhD
WILLIAM HADDON, Jr., MD

Passenger automobiles manufactured from January 1, 1972, to August 14, 1973, for sale in the U.S. are equipped with a buzzer-light system to remind front outboard seat occupants to use safety belts. This system was required by federal standard[1] as an optional alternative to passive approaches, that is, approaches requiring no action by the person to be protected,[2,3] effective in frontal barrier crashes up to 30 miles per hour. Since the buzzer-light system can be circumvented in many ways, the study reported here was undertaken to compare belt use of drivers of vehicles with the buzzer-light system to that of drivers of similar vehicles lacking this device.

Safety belt use or nonuse by drivers in their vehicles was visually observed at 152 sites in and around 10 cities and towns in four states in May, June, and early July, 1972. Sites were chosen where belt use can be seen easily in daylight from the right side of the vehicle at some freeway entrances and exits, jam areas, and other sites where vehicles slow to less than about 15 miles per hour. As a given vehicle approached, the observer tape-recorded the sex, estimated age, and racial appearance of the driver. When the vehicle was alongside, the driver's use or nonuse of belts was recorded. The rear license plate number was recorded as the vehicle moved away. The process was then repeated for the next available vehicle.

The license plate numbers subsequently were matched to the vehicle identification numbers of the vehicles to which the license plates were assigned by the cooperating motor vehicle departments (those of Maryland, Pennsylvania, Virginia, and West Virginia). The vehicle identification numbers were then decoded and categorized according to presence or absence of the buzzer-light system, using the identification number codes supplied by American Motors Corporation, Chrysler Motor Corporation, Ford Motor Company, General Motors Corporation, and Volkswagen of America.

Of the 58,121 vehicle identification numbers obtained in this way, 5,745 were of 1972 vehicles for which we had information as to the presence or absence of the buzzer-light system. In the 2,864 vehicles equipped with the buzzer-light system, 18 per cent (501) of the drivers were using belts, and in the 2,795 vehicles without the buzzer-light system, the belts were used by 16 per cent (441). The slight difference between 18 per cent and 16 per cent falls short of usually accepted standards for statistical significance ($\chi^2 = 2.88$, df = 1, $p = 0.09$).

No statistically significant difference in belt use between buzzer-light equipped and nonequipped vehicles was found for vehicles manufactured by each of the four major U.S. manufacturers as well as by the one non-U.S. manufacturer from which vehicle identification information was received. Also, there was no statistically significant difference in use between equipped and nonequipped vehicles when the data were analyzed by age and sex of driver.

When drivers were categorized by racial appearance, 19 per cent of 2,644 white drivers in buzzer-light equipped vehicles were using belts compared to 16 per cent of the 2,584 in nonequipped vehicles, a slight though statistically significant difference by usual standards ($\chi^2 = 4.11$, df = 1, $p < 0.05$). Black drivers were using belts in 5 per cent of the 203 equipped vehicles and 8 per cent of the 195

nonequipped vehicles, a difference of no statistical significance ($\chi^2 = 0.87$, df = 1, $p = 0.35$).

Perhaps some persons were more inclined, and others less, to use belts when confronted by the buzzer-light system. However, given the large sample size considered here and the lack of statistically significant difference in the overall belt use rate of drivers in equipped and nonequipped vehicles, the buzzer-light system can only be described as a public health failure. It is unlikely that it will contribute to a reduction in overall frequency or severity of injuries associated with motor vehicle crashes, which was its purpose under the statute providing for motor vehicle safety standards.

The two studies that were done of the buzzer-light system before the standard went into effect were scientifically inadequate. In 1970 the then National Highway Safety Bureau installed five different combinations of belts, lights, and buzzers in General Services Administration cars used by federal employees.[4] On the basis of responses to questionnaires distributed to these drivers, the buzzer-light system was said to be effective in increasing belt use. However, the researchers ignored the documented discrepancy between claimed and actual belt use.[5]

Also ignored was the fact that people often change their behavior or claimed behavior as a result of being studied rather than as a result of experimental conditions, as has been repeatedly documented by behavioral scientists since the studies of workers in the Hawthorne plant of Western Electric Company in the 1920s.[6] And the researchers ignored the fact that a General Services Administration Order requiring that "each GSA employee operating or riding in an interagency motor pool vehicle shall wear his seat belt at all times while the vehicle is in motion"[7] had been in effect since 1967. A number of other agencies using GSA cars had similar policies.

A second study, conducted for Ford Motor Company, involved drivers in new cars which they had accepted for test driving for 30 days.[8] None of these drivers had claimed in a telephone survey to use belts more than half the time. After 30 days an interviewer took a drive with each driver and observed that a majority were using belts. However, the "intensive introduction to the vehicle, complete with test drive and a thorough explanation of the operation of all features which it contained," coupled with the prestudy telephone interview about safety belt use, could easily have created a perception of the expectation that safety belts should be used.

If the intent of the statute providing for motor vehicle safety standards to reduce death and injury on the highways[9] is to be further realized, much better science and much better standard setting based on that science must be forthcoming. The principle that properly designed field studies should demonstrate efficacy of a public health policy before it is applied to the general population is as applicable to injury amelioration as it is to vaccine or drug testing.

References

1. Federal Register. Standard Number 208. Occupant Crash Protection. 36:22947, 1971.
2. Haddon, W., Jr., and Goddard, J. L. An Analysis of Highway Safety Strategies. In Passenger Car Design and Highway Safety. Association for the Aid of Crippled Children and Consumers Union of the U.S., New York, 1962.
3. Haddon, W., Jr. Strategies in Preventive Medicine: Passive vs. Active Approaches to Reducing Human Wastage (Editorial). J. Trauma 14:4, 1974.
4. Perel, M., and Ziegler, P. M. An Evaluation of a Safety Belt Interlock System. National Highway Traffic Safety Administration, Washington, D.C., 1971.
5. Waller, P. F., and Barry, P. Z. Seat Belts: A Comparison of Observed and Reported Use. University of North Carolina Highway Safety Research Center, Chapel Hill, 1969.
6. Roethlisberger, F. J., and Dickson, W. I. Management and the Worker. Harvard University Press, Cambridge, 1934.
7. General Services Administration Order ADM 5910.1, December 1, 1967.
8. Shaw, D. J. Interim Results from Test Drive I Advanced Features Study. Transmitted to Docket 69-7, National Highway Traffic Safety Administration, July 27, 1971.
9. Public Law 89-563, 89th Congress, 2nd Session, September 9, 1966.

Drs. Robertson and Haddon are with the Insurance Institute for Highway Safety, Watergate 600, Washington, DC 20037.

Editor's Note: The articles which appear in PUBLIC HEALTH BRIEFS have been condensed by the authors for publication in the *American Journal of Public Health.* An extended version of each report published in this Journal Department is on file at APHA headquarters. Single copies of the extended version are available for a limited period of time from the American Journal of Public Health, APHA, 1015 Eighteenth Street, NW, Washington, DC 20036. When requesting the extended report, please cite the title of the published article, name of principal author, and the AJPH issue in which the condensed report appeared in PUBLIC HEALTH BRIEFS.