PMV Risk Behavior/Attitude Modification: A Best Practices Reference Guide

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Defense Safety Oversight Council

EXECUTIVE SUMMARY

The Defense Safety Oversight Council (DSOC) Private Motor Vehicle (PMV) Task Force sponsored a project to identify existing military and civilian behavior/attitude modification training programs designed to reduce PMV mishaps and fatalities, document the components of each program, and evaluate each program's scientific merit, with results included in a Best Practices Reference Guide.

Section 1 of this Best Practices Reference Guide summarizes the results, with a 2-page synopsis of each of the eight programs reviewed, its ranking, and its advantages and disadvantages. Section 2 of the guide summarizes the results of a review of the scientific literature and evidence-based interventions and strategies to reduce specific PMV risk behaviors. The literature indicates that various behavior/attitude modification strategies have been shown to be effective in improving PMV risk behavior.

Section 1: A Review of Nine PMV Risk Behavior/Attitude Modification Programs

Background and Methods

The PMV task force identified eight programs that have been in use, are currently in use, or are proposed to be used by the military to reduce private motor vehicle (PMV) accidents and deaths. Each program's website was reviewed and a semi-structured interview was conducted with representatives of each program. Using all available information, programs were ranked on eight criteria (behavior, methodology, evidence based, implementation, goals/objectives, feasibility, instructor and curriculum standardization) utilizing a 5 point Likert Scale (1 minimum, 5 maximum). A definition of each category is provided at the end of this section on page 20. The individual scores on each criterion were summed for a total score of 8 to 40. Programs were ranked based on total score from most effective (highest) to least effective (lowest) total scores. The table below shows the individual criterion scores of each program.

Behavioral Modification Programs, Evaluation Criteria and Scores*

Behavioral Modification Program	Behavior	Methodology	Evidence Based	Implementation	Goals/Objectives	Feasibility	Instructor Standardization	Curriculum Standardization	**Total**
Alive at 25	5	5	4	5	5	4	5	5	38
Attitudinal Dynamics of Driving (ADD)	4	5	5	5	3	4	5	5	36
AAA Driver Improvement Program (DIP)	1	1	1	5	3	5	5	5	26
Road Rageous	1	2	1	4	2	5	4	3	22
Safe Start	1	1	3	4	1	1	5	5	21
Save a Life Tour	1	1	3	4	1	4	3	3	20
Smith System	1	2	1	4	3	1	5	1	18
Stay Alive From Education (S.A.F.E.)	1	1	1	3	1	2	1	1	11
Street Smart	1	1	1	1	1	1	1	1	8

*Based on a 5-point Likert Scale

Section 1 of this guide provides a user-friendly, 2-page synopsis of each program, its ranking, and its advantages and disadvantages. As indicated by the total score, Alive at 25 and Attitudinal Dynamics of Driving (ADD) courses ranked the highest across the categories and overall. These programs, as compared to the others, were developed with the most robust methodology, are standardized, and target the population that is most affected by PMV accidents in the military population. Furthermore, these programs are based in behavior change theory, have a strong evidence base and demonstrated positive outcomes that have been proven in various settings replicated throughout the country.

Alive at 25

Behaviors addressed: PMV risk behavior in general

Target population: Ages 15-24

Total effectiveness score: 38

Ranking among six programs evaluated: 1

Ranking on each criterion:

Behavior	Methodology	Evidence Based	Implementation	Goals/Objectives	Feasibility	Instructor Standardization	Curriculum Standardization	**Total**
5	5	4	5	5	4	5	5	38

*Based on a 5-point Likert Scale.

Synopsis

The Alive at 25 program was initially developed based on a recommendation by the National Safety Council (NSC) Internal Board to develop a class that specifically targeted young driving adults that was separate from the Attitudinal Dynamics of Driving (ADD) class (evaluation of ADD follows). The NSC used Dr. William Glasser's Choice Theory and the Stages of Change theory. The goals of the program are to have students recognize that people from ages 15-24 (the age group for which the program is targeted) are more likely than anyone else to be injured or killed in a motor vehicle crash, describe the consequences of making poor judgments or taking unnecessary risks in a motor vehicle, recognize positive characteristics that can help them and their friends make wise driving choices and to make a personal commitment to making better driving choices and to help their friends to make better driving choices as well. These goals are assessed through a written evaluation of the students' experience in the program and from reports provided by schools and other training agencies indicating a drop in problematic driving by members of the class. When initially developed, the program curriculum was evaluated by the DDCIAC, state DMVs, law enforcement agencies, insurance companies, schools, and universities. Several pilot studies of the program were conducted across the US and evaluated by the hosting agency, participants of the program and invited professionals from various disciplines.

The course is taught by NSC instructors who have completed an instructor development course, are monitored through two real classes, and have been certified by the NSC. Instructor certified courses are taught by an NSC certified Instructor Trainer using a standardized set of candidate instructor training materials. The Alive at 25 program can be considered standardized, as instructors are certified and agencies conducting the training have to agree to use only NSC

visuals, training materials, and format. Since initial implementation, the program has been reproduced in Colorado, Idaho, California, North Dakota and Wyoming.

Although no scientifically reviewed results have been published to date, several studies have been conducted in Colorado on course content (1996), CO state trooper perceptions of class participants (2000), and an evaluation of self-reported attitude change in court ordered and voluntary participants (2002). The studies showed a positive outcome in knowledge, a decrease in risky driving and drinking/drugging/driving behaviors, and an increase in Solutions for Safety and Social Solution scales. However, it is important to note that these results may not be directly attributable to the intervention. Since introduction of the program, the NSC touts that the program has reduced PMV accidents and deaths, yet the scientific evidence to support these claims could not be confirmed by the information provided.

Advantages

- Developed by NSC, a leader in driver safety
- Theory-based
- Peer-reviewed when initially developed and continues to be updated
- Instructors are certified by the NSC
- Standardized curricula
- Implemented in several states (i.e., CO, ID, CA, ND, WY)
- Target audience: 15-24 year olds

Disadvantages

- Behavior change may not be directly related to the course.
- Has not been evaluated in a military environment

Contact Information

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Attitudinal Dynamics of Driving (ADD)

Behaviors addressed: PMV risk behavior in general

Target population: At-risk drivers (e.g., with prior violations, especially alcohol-related)

Total effectiveness score: 36

Ranking among six programs evaluated: 2

Ranking on each criterion:

Behavior	Methodology	Evidence Based	Implementation	Goals/Objectives	Feasibility	Instructor Standardization	Curriculum Standardization	**Total**
4	5	5	5	3	4	5	5	36

*Based on a 5-point Likert Scale.

Synopsis

The purpose of the Attitudinal Dynamics of Driving (ADD) program is to inform participants of their connection between driving behaviors and attitudes that impact decision-making and to help participants recognize the motivation behind effective and ineffective decision making. The recommendation for such a course was made by the NSC's International Advisory Committee. From the recommendation, the NSC approached Dr. William Glaser who wrote the book on Choice Theory, to develop the course. Since the course's inception, it has been updated 3 times. The course incorporates Choice Theory/Reality Theory (CT/RT) in its curricula. The course includes 4 sessions and lasts between 6 or 8 hours depending on the time purchased by the client.

The program is purchased by a company or implemented by a state and certified NSC instructors train the individuals that company has identified to train their employees. The course is standardized and trainers must maintain certification through annual trainings.

The course has been implemented by several companies and states. The Commonwealth of Massachusetts has instituted the course as a requirements for drivers that are driving under the influence/driving while intoxicated as a way to reduce the pressures on the court system. The Registry of Motor Vehicles conducted a study for the Commonwealth of Massachusetts in April 2010 and found that more than 349,000 drivers have completed the DDC-ADD course. Findings from the report focus on those drivers who participated in the course between 1 July and 30 September 2007 and compared the 12 month pre-ADD and post-ADD motor-vehicle records. The results indicate that "all participant groups had significantly fewer violations in the 12

months after taking DDC-ADD. The percentage of surchargeable incidents after DDC-ADD ranged from 61% decrease in major traffic violations for males to a 75% decrease in surchargeable violations for females" (National Safety Council, April 2010).

Advantages

- Uses theory to change behavior
- Partnered with theorist to develop course
- Peer-reviewed when developed and continues to be updated
- Continues to show effectiveness through reports published by NSC and those states that implement the training

Disadvantages

- Has not been evaluated in a military environment
- Not clear on how the goals are measured

Contact Information

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AAA Driver Improvement Program (DIP)

Behaviors addressed: PMV risk behavior in general

Target population: Violation offenders, fleet drivers and mature operators

Total effectiveness score: 26

Ranking among eight programs evaluated: 3

Ranking on each criterion:

Behavior	Methodology	Evidence Based	Implementation	Goals/Objectives	Feasibility	Instructor Standardization	Curriculum Standardization	**Total**
1	1	1	5	3	5	5	5	26

*Based on a 5-point Likert Scale.

Synopsis

The AAA Driver Improvement Program (DIP) was established for violation offenders, fleet drivers and mature operators and the goal of the program is to reduce crashes and save lives. DIP is not based on behavioral theory and no rigorous scientific evaluation has been conducted.

DIP has been implemented by AAA clubs and third party vendors in the U.S. and around the world. Several states utilize the course for offenders to reduce points accessed or dismiss traffic violations. The program has also been implemented by the Services (i.e., Coast Guard, Army, Navy and Marines).

DIP instructors must undergo 40 hours of training before certification and maintain certification by teaching two classes a year and returning every three years for an 8 hours re-certification course. The instructor training course includes 8 modules, DVDs and interactive classroom setting and is supplemented with "How to Drive" textbook. Instructors are tested on this information and must give a mock presentation to pass the course and be certified.

Advantages

- Has been implemented by the Services (excluding Air Force)
- Has been implemented in the U.S. and world-wide
- Standardization of Instructors

- Re-certification of Instructors

Disadvantages

- No basis in behavioral change theory
- Not scientifically evaluated to support goals/outcomes of the program

Contact Information

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Road Rageous

Behaviors addressed: PMV risk behavior in general

Target population: General population

Total effectiveness score: 22

Ranking among eight programs evaluated: 4

Ranking on each criterion:

Behavior	Methodology	Evidence Based	Implementation	Goals/Objectives	Feasibility	Instructor Standardization	Curriculum Standardization	**Total**
1	2	1	4	2	5	4	3	22

*Based on a 5-point Likert Scale.

Synopsis

The goals of the Road Rageous campaign are to reduce collisions and change driving behavior. These goals are measured independently by each company that purchases the campaign as there are no specific assessments conducted by the Road Rageous company itself. Despite being developed by 3 psychologists, the campaign was not published in a scientifically reviewed journal and it did not include any specific basis in behavior change theory.

The campaign is provided in a classroom setting with 20-30 students. Companies can implement the campaign in one of two ways. The first is to identify individuals from within the company purchasing the campaign to become certified Road Rageous instructors and then return to the company to implement the training. The second is for the company to hire a certified instructor to teach the program to their employees. Training is conducted through the use of workbooks and videos and the didactic course instruction is flexible to facilitate dialogue from the students to the instructor and back such that the instructor uses the student's messages to incorporate the concepts of the course utilizing three teaching techniques; acknowledge witness and modify to teach the course concepts.

The campaign has been purchased and implemented by several companies, including the military (specifically the Navy, Marine Corp, Army Corps of Engineers) and the Florida Department of Motor Vehicles. The companies report a reduction in collisions and change in driving behavior resulting from use, but these results have not been published in any peer-reviewed journals. No scientifically-based outcomes of the study were provided during the interview or on the website about the program.

Advantages

- Has been implemented by the military (i.e., Army, Navy, Marines)
- Naval Safety Center has approved the course for Command use
- Facilitator-led or led by trained employees that have completed training

Disadvantages

- Unable to evaluate curriculum for course instructors
- Unable to evaluate course instructor certification
- Unable to evaluate curriculum for students
- No information available to support programs claims of being effective in reducing collisions and changing driving behavior
- Does not utilize a specific behavior change theory to modify driving behavior
- Has not been evaluated in a military environment

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SafeStart

Behaviors addressed: Safety behavior in general, PMV risk behavior is one component

Target population: General population

Total effectiveness score: 21

Ranking among eight programs evaluated: 5

Ranking on each criterion:

Behavior	Methodology	Evidence Based	Implementation	Goals/Objectives	Feasibility	Instructor Standardization	Curriculum Standardization	**Total**
1	1	3	4	1	1	5	5	21

*Based on a 5-point Likert Scale.

Synopsis

The goals of the SafeStart are to teach the 4 states that lead to critical errors and how/when to recognize them when at work, at home, or on the road. SafeStart is not specific to privately-owned vehicles and reducing driving injuries and deaths. However, the concepts are applicable to PMV operation and include a home kit that includes an episode entitled “SafeStart on the Road”. This component applies the program concepts to driving. Driving is also addressed in one of the extended application units which are part of the continued training. The program was not developed based on any specific behavioral change theories.

The course itself is facilitator-led and includes 5 core units, 90 minutes each, and is to be taught over a 5-week to 5-month period. SafeStart facilitators at a company are trained in a 2-3 day “train the trainer” course by SafeStart consultants. The trainers are taken through the 5 core units and provided an interactive training process that includes story telling from each trainee’s perspective and encounters with safety mishaps. Upon conclusion of the course, the trainees are certified and then train other employees on the program. The trainers should receive refresher training from SafeStart facilitators every 3-5 years in order to provide refresher training to the company’s employees.

Companies that have had trainers trained and implemented the course have released vignettes and other information indicating the reductions they have measured/observed in their company. However, specific and measurable outcomes are not available from the SafeStart company directly. Each company measures their own success using its own standards. Due to the confidentiality of each company that has implemented the program, their results have not been published in peer-reviewed journals.

Advantages

- Instruction materials (i.e., workbooks, videos) are standardized
- Facilitators are trained and certified to teach the program

Disadvantages

- Very limited relevance to PMV driving, thus unable to evaluate PMV portion of the program
- Program evaluation/measures of success are ad hoc (defined by each company that uses the program)
- No standard evaluation/measures of success by the SafeStart company itself
- Timeframe for implementation ranges from 5 weeks to 5 months

Contact Information

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Save-a-Life Tour

Behaviors addressed: Alcohol-related PMV risk behavior

Target population: General population

Total effectiveness score: 20

Ranking among eight programs evaluated: 6

Ranking on each criterion:

Behavior	Methodology	Evidence Based	Implementation	Goals/Objectives	Feasibility	Instructor Standardization	Curriculum Standardization	**Total**
1	1	3	4	1	4	3	3	20

*Based on a 5-point Likert Scale.

Synopsis

The goals of the Save-A-Life Tour are to inform audience participants of the mistakes made when under the influence of alcohol at different levels of inebriation and to demonstrate to the participants the results of those mistakes. These goals/objectives are accomplished through hands-on experiences and vignettes/personal stories from the speaker that has been directly affected by driving while under the influence. The program uses video, personal stories, impact banners, and an intoxicated vehicle simulator with commentary. The program was not developed based on any specific behavioral change theories.

The program includes 8,000 pounds of equipment that provides 50 feet of awareness (e.g., coffin with a mirror saying reserved for next drunk driver) and approximately 6 hours of small group hands-on training. In a large group, there is didactic instruction, followed by a 15-20 minute video of poor choices and how it can affect someone's life. Next, a speaker that matches the demographics of the audience provides his/her personal story and how they and others were affected by the poor choice(s) they made. Participants then rotate through sessions that include a video and hands-on instruction on an hourly basis that include numerous stations with videos on driving while intoxicated, seatbelt use, distracted driving, and a motorcycle video. At least one participant enters a simulated car for 80 miles of road driving. During the virtual driving session, blood alcohol content (BAC) is increased while the moderator narrates the errors/mistakes that are being made as the driver becomes intoxicated while the audience watches.

The program has been used across all Services of the military and at non-military installations such as college campuses. According to the information provided, it is the only government-approved training program for the U.S. Armed Forces. Participants take a 10-15 question pre-program survey and respond to a similar post-program survey asking about what the participant learned. The information from the survey is sent to the contracting company within 2-3 days following conclusion of the program. There is no specific assessment for evaluation of program objectives other than what was learned. There are no effectiveness publications in peer-reviewed journals.

Advantages

- Standardized videos and car simulator.
- Has been implemented in the military environment across the Services
- Scalable to accommodate various sized of military units

Disadvantages

- Unable to evaluate the didactic instruction, videos, or other materials
- Unable to evaluate instructor training
- Does not incorporate behavioral change theory to change behavior
- Unable to evaluate the programs claims of being effective in reducing collisions and changing driving behavior
- No standard evaluation/measures of success by the Save a Life company itself

Contact Information

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Smith Systems

Behaviors addressed: Fleet driving risk behavior

Target population: General population

Total effectiveness score: 18

Ranking among eight programs evaluated: 7

Ranking on each criterion:

Behavior	Methodology	Evidence Based	Implementation	Goals/Objectives	Feasibility	Instructor Standardization	Curriculum Standardization	**Total**
1	2	1	4	3	1	5	1	18

*Based on a 5-point Likert Scale.

Synopsis

The Smith System was developed in the 1940's by Howard Smith. The goals of the Smith System are to reduce mistakes and collisions and is accomplished by utilizing the 5 Keys to Safe Driving: 1) Aim high in steering; 2) Get the big picture; 3) Keep your eyes moving; 4) Leave yourself an out; and 5) Make sure they see you. The course, designed for a maximum of five students at a time, is primarily set-up for fleet driving but the concepts, skills and recommendations from the course can be applied to PMV driving. There is no known basis in behavioral theory.

Companies that purchase the Smith System identify individuals from their company they would like to be trained. These individuals attend a 5-day "Train-the-trainer" course. These trainers are then certified to return to the company as an instructor to implement the course. The Smith System course provides short didactic instruction followed by on-the-road driving that is initially led by the instructor demonstrating the 5 Keys to Safe Driving while the students watch. Each student gets to drive approximately 3 times throughout the one-day course and drive in the traffic he/she is accustomed to. After the initial driving session and coaching received by the instructor, the students conduct the coaching throughout the remaining driving sessions. Upon conclusion of the training, the instructor highlights each student's strengths and provides feedback on his/her areas for improvement.

There is no available published effectiveness data available, as this information is held individually by each company that has purchased the program.

Advantages

- Trainers receive a 5-day course and are certified by Smith Systems upon completion
- 1-day training with hands-on driving provided to participants

Disadvantages

- Designed for fleet drivers
- Maximum of 5 participants per instructor class
- Is not based in behavior change theory
- Unable to evaluate didactic instruction and methodology for behavior change
- Unable to evaluate reported effectiveness and outcomes

Contact Information

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Stay Alive From Education (S.A.F.E.)

Behaviors addressed: Drinking and driving, texting and driving, seatbelt use

Target population: Adolescents and college students

Total effectiveness score: 11

Ranking among eight programs evaluated: 8

Ranking on each criterion:

Behavior	Methodology	Evidence Based	Implementation	Goals/Objectives	Feasibility	Instructor Standardization	Curriculum Standardization	**Total**
1	1	1	3	1	2	1	1	11

*Based on a 5-point Likert Scale.

Synopsis

The Stay Alive From Education (S.A.F.E.) was developed in 1989 in Miami-Dade County, Florida to offer high school and college students information regarding the consequences of driving under the influence of alcohol and other drugs, not wearing seat belts, and texting while driving to help them make better choices. The S.A.F.E. educational program is taught by a paramedic or firefighter with over 10 years of experience. The instructor provides stories and examples according to a script that includes: (a) an introduction to include disclaimer about graphic images, (b) information on types of calls received, especially the trauma calls, (c) examples of trauma calls from alcohol/drug use and driving, not wearing seat belt, and (d) demonstration. There is no known base in behavior change theory and the instructor certification process was not clear.

A study on the effectiveness of the S.A.F.E. program was conducted by a professor at the University of Miami in 2001. The results indicate an increase in knowledge, attitudes, and self-reported behaviors from one week prior to the program to one month after. However, the particular knowledge, attitudes, and behaviors measured were not clearly defined, the sample consisted of 10^{th} through 12^{th} graders at a magnet school, and lacked a control group who did not receive the intervention.

Advantages

- Study from University of Miami showed one-month effectiveness in increasing knowledge, attitudes, and behaviors of high school students.

Disadvantages

- No basis in behavior change theory
- Unable to evaluate curriculum/certification for course instructors
- Unable to ascertain details of story-based curriculum
- No standard evaluation/measures of success by S.A.F.E.
- Numerous methodological limitations of effectiveness study conducted
- Has not been evaluated in a military environment

Contact Information

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Definitions of each Criterion

Behavior - Program is based in behavioral change theory.

Methodology - Program has a clear methodological scientific design/approach that can be replicated.

Evidence-Based - The program has scientifically measurable, evidence based outcomes that have resulted in reduced PMV injuries and deaths.

Implementation - The program has been reproduced/implemented by other companies/military facilities.

Goals/Objectives - The program contains clear and measurable goals/objectives.

Feasibility - The program can be reproduced on the scale to implement within a military service.

Instructor Standardization - Instructors are taught through a standard process and standard curriculum

Curriculum Standardization - Curriculum (e.g., text, handouts, book(lets), and other information) is standardized

Section 2: Evidence-based PMV Risk Behavior/Attitude Interventions and Strategies – A Review of the Scientific Literature

Background and Methods

A systematic review of PMV risk reduction strategies and interventions was undertaken. Section 2 of this guide provides examples of strategies and programs directed at reducing specific PMV risk behaviors that have been documented to be effective according to the scientific literature. Articles were identified by searching academic databases such as PubMed, PsychINFO, and ERIC, as well as internet search engines like GoogleScholar. Resulting abstracts of interventions were reviewed for relevance and effectiveness. Full-text articles were obtained for any strategy reported to be effective at reducing a PMV risk behavior or increasing a positive PMV behavior. The interventions and prevention strategies were categorized based on the major PMV risk behavior addressed according to the following list:

- Seatbelt use
- Driving after drinking
- Fatigued driving
- Speeding
- Distracted driving
- Other driving risk behaviors
- Motorcycle risk behaviors

Programs are briefly described in this Best Practices Guide, along details regarding their demonstrated impact or effectiveness evaluated. The articles are referenced in the bibliography. Safety officials and leadership are encouraged to adapt the evidence-based strategies that target specific risk behaviors as needs on particular bases are identified.

Seatbelt Use

Demerit points system:

Penalty points legislation introduced in Italy in which prior fines and points doubled for not wearing a seatbelt as part of larger intervention to toughen traffic laws. There was an increase in observed seat belt use of 51.8% (95% CI 48.7% to 54.9%) among drivers, 42.3% (95% CI 39.2% to 45.5%) among front passengers, and of 120.7% (95% CI 99.4% to 144.3%) among rear passengers. (Zambon, Fedeli, Visentin, Marchesan, Avossa, Brocco and Spolaore, 2007)

Visual prompt:

Sign posted at intersection that said ‘‘Buckle up, Stay safe’’. Safety belt usage was stable across 4 years at approximately 80% for both male and female drivers and front seat passengers for the six communities with signs and was approximately 55% for control sites. (Cox, Cox, and Cox, 2005)

A press release, signs, and posters were posted warning of day and night seatbelt enforcement throughout the city and at the exits of all drinking establishments as well as several shopping malls. In general, seatbelt use rose an average of 5% during enforcement and 3% post-enforcement. (Malenfant and Houten, 1988)

Person-held visual prompt:

Individual displays poster reading ‘‘Please Buckle Up—I Care’’ to drivers exiting a parking lot. Drivers who complied were then shown the ‘‘Thank You’’ side of the poster for approximately 10 s. Seatbelt use rose from 44% to 78%. Post-intervention seatbelt use dropped to 64%. No one who buckled their seatbelt unbuckled it a block away. (Clayton, Helms, and Simpson, 2006)

In Phase I, an individual displays poster reading ‘‘Please Buckle Up—I Care’’ to drivers facing traffic. Drivers who complied were then shown the ‘‘Thank You’’ side of the poster. In Phase II, an individual displays poster reading ‘Click It or Ticket’’ with no obvious police presence. Drivers exposed to the “Click It or Ticket” prompt were significantly more likely to wear seat belts and/or buckle up than were drivers exposed to “Please Buckle Up—I Care”. **(**Clayton and Helms, 2009)

Behavioral change counseling:

Twenty-minute behavioral change counseling on seatbelt use as part of a six-topic general risk behavior intervention. Those assigned to the intervention group underwent a 20-minute session of BCC with a trained therapist. The experimental group was 34% more likely to wear seatbelts compared to a control group at 3 months [OR = 1.34 (1.00-1.79)] and 47% more likely at 6 months [OR = 1.47 (1.09-1.96)]. (Johnston, Rivara, Droesch, Dunn, and Copass, 2002)

Sweepstakes:

Individuals were “caught” wearing their seatbelts and entered into a raffle to win gift certificates donated by community merchants. Faculty and staff increased their belt usage markedly, whereas students increased their belt use only slightly. A cost-effectiveness analysis indicated that the sweepstakes cost an average of $0.98 per each newly buckled driver. Seatbelt usage diminished to initial baseline levels after the final withdrawal of the program. (Rudd and Geller, 1985)

Driving after Drinking

Employer-based program with immediate consequences:

Mandatory alcohol testing programs for motor carrier drivers (pre-employment testing, random testing, reasonable suspicion testing, and post-accident testing). Those with Blood Alcohol Concentrations (BACs) above 0.04 g/dL (i.e., the legal limit) suspended immediately. Those who register a BAC of 0.02–0.03 g/dL are removed from duty for 24 hours. The prevalence of alcohol involvement in fatal crashes decreased by 80% among motor carrier drivers and 41% among non– motor-carrier drivers. With adjustment for driver age, sex, history of driving while intoxicated, and survival status, implementation of the mandatory alcohol testing programs was found to be associated with a 23% reduced risk of alcohol involvement in fatal crashes by motor carrier drivers [OR = 0.77, (0.62-0.94)]. (Brady, Baker, DiMaggio, McCarthy, Rebok, and Li, 2009)

Secret witness reporting program:

Information leading to the arrest of a drunk driver resulted in a $100 reward to the anonymous tipster. In its first decade, the citizen reward program appears to have averted some 275 alcohol-related accidents for social cost savings of between $21,000 and $5.6 million. Further, possibly 4495 arrests were precluded, saving some $1-3 million in arrest-related costs. (Van Vleck and Brinkley, 2009)

Educational programs:

Four weekly sessions for a total of 10 hours with information on the effects of alcohol and other drug use on driving ability and health, feedback on the severity of alcohol-related problems and focus on developing a written Driving Under the Influence (DUI) avoidance plan with personalized information on future risk for DUI, group activities, and homework assignments. The hazard of recidivism was lower for individuals who completed the program than for individuals who did not complete or did not enroll in the program. Recidivism rates were further reduced following the introduction of curriculum revisions. Attendance of court-mandated remedial intervention programs lower subsequent DUI arrests and program content is associated with lower rates. (Robertson, Gardner, Xu, and Costello, 2009)

Twelve-hour educational program focusing on participants controlling their driving, teaching students to make a decision before leaving home not to drive to a drinking event, thus greatly limiting the possibility of drinking and driving. Offenders receiving the experimental curriculum exhibited significantly lower 1-year and 2-year recidivism rates than those receiving the traditional curriculum focusing on participants attempting to find a ride home after participants have failed to control consumption and realize that they have had too much to drink. (Rider, Voas, and Kelley-Baker, 2007)

Incentive-based program:

Free entrance to Milan nightclub for one month if BAC below legal limit upon leaving club. Experimental group's mean BAC was significantly lower than control group's BAC. (Aresi, Fornari, Repetto, and Scolari, 2009)

Family-based program:

Family-based session to improve driver's decision-making skills and develop clear standards regarding driving-related behavior, including a written contract stating expectations, a plan for monitoring compliance with these expectations, and consequences for compliance or non-compliance. Experimental groups was significantly less likely to drive under the influence of alcohol and to ride in a car with someone under the age of 21 who had been drinking. Intervention participants were less likely to drive without a license and use drugs and drive. No differences were found with respect to receiving traffic tickets or getting into accidents. (Haggerty, Fleming, Catalano, Harachi, and Abbott, 2006)

Fatigued Driving

Napping or coffee intervention:

All participants were asked to drive in a daytime baseline (intervention-free), and nighttime coffee, prior nap, and placebo conditions. Compared to daytime, after placebo the number of inappropriate line crossings was significantly increased. Both coffee and napping reduced the risk of inappropriate line crossings, compared with placebo, in young and middle-aged participants with enhanced effect for napping in the young participants. (Sagaspe, Taillard, Chaumet, Moore, Bioulac, and Philip, 2007)

Speeding

Belief modifying intervention:

Eight-page booklet containing information about the risks of speeding in 30 miles per hours (mph) areas and persuasive messages to target specific behavioral, normative, and control beliefs associated with complying with 30 mph speed limits. Behavioral: 5 positive outcomes associated with complying with the speed limit and 1 negative non-compliance outcome. Normative: participants asked to consider if friends, spouses/partners, parents/children would want them to be involved in a traffic accident due to speeding. Control: strategies to avoid speeding when in a rush, when surrounding traffic is speeding, when speed limit is unknown, or when driving on long straight roads. Compared with controls, experimental participants were significantly more likely to perceive that driving on long straight roads would facilitate their compliance with speed limits, perceive greater control over their behavior, and report complying with speed limits more often following intervention. (Elliott and Armitage, 2009)

Visual prompt:

Attitude questionnaires given to drivers of target road, then in Week 2, four police warning signs on road. In Week 3, police presence with signs, then in Week 4, no police presence with signs. In Week 5, the signs are removed. Intervention reduced percentage of speeding drivers and the effect lasted into the week following the removal of police warning signs and two weeks after police presence. Six weeks later, there still seemed to be some persisting effect. (Holland and Conner, 1996)

Distracted Driving

Person-held visual prompt:

Individual displays poster reading ‘‘Please Hang Up—I Care’’ to drivers exiting the parking lot. Drivers who complied were then shown the ‘‘Thank You’’ side of the poster for approximately 10 s. Cell phone use remained at 6%, but the proportion of drivers hanging up their cell phones when prompted to do so increased. The percentage of drivers using cell phones one block after hanging up averaged 36%. (Clayton, Helms, and Simpson, 2006)

Other Driving Behaviors

“Look Both Ways” prompt:

A ‘‘LOOK BOTH WAYS’’ sign and a light-emitting diode (LED) sign that featured animated eyes scanning left and right in front of a stop sign. The proportion of motorists coming to a full stop at three sites increased from baseline by an average of 26%. (Van Houten and Retting, 2001)

Administration of self-report surveys about driving behavior and attitudes:

Simple administration of a survey about self-reported driving behavior, attitudes towards risk taking, or attitudes towards accidents two times. There was a significant decrease in self-reported risky driving behavior from the initial questionnaire to the follow-up questionnaire in all types of self-report surveys. (Falk, 2010)

Motorcycle

Simulated driving program:

Simulated driving, which exposes the novice drivers to several hazardous scenarios in a short period of time, provides an opportunity for the participants to experience the scenarios and consider how hazardous situations arise and how to respond to them. Direct feedback allows the participants to view their actual performance and compare it with their expected performance and accordingly recalibrate their way of driving in similar kinds of hazardous scenarios. Road hazard handling performance scores were significantly higher for the trained group and the training effect was greater for equivalent scenarios than for analogical ones. The trained drivers anticipated potential hazards in advance to a larger extent than the untrained, as indicated by both earlier speed reduction and subjective self-report data when approaching hazards. Subjective mental workload of the trained drivers was significantly lower in completing the simulated driving task. (Wang, Zhang, and Salvendy, 2010)

Health education program:

Health education on the epidemiology of motorcycle crash injury in the area, motorcycle-related risk, and the effective protection on helmet use; motorcycle rider education, including traffic laws, vehicle regulations, traffic signs, and written and skill tests for a driving license. Two years after the program, motorcyclists in the intervention villages in Thailand were significantly more likely to have valid licenses than those in the control villages (69.7% vs. 46.5%). Furthermore, the proportion of motorcyclists who always or often wore helmets was significantly greater and the injury rates were significantly lower in the intervention vs. control villages. (Swaddiwudhipong, Boonmak, Nguntra, and Mahasakpan, 1998)

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