

*PROMOTING SAFETY BELT USE AMONG STATE EMPLOYEES:  
THE EFFECTS OF PROMPTING AND A  
STIMULUS-CONTROL INTERVENTION*

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This study assessed the effects of dashboard stickers and signature sheets on safety belt use among occupants of state-owned vehicles in three Florida agencies. The stickers and signature sheets contained information regarding a regulation requiring safety belt use and a consequence of a 25% reduction in benefits for noncompliance if the driver were to become involved in an accident. Safety belt use significantly increased during the intervention phase in all three agencies and maintained variable but high levels for 5 months. In Agency 1 and Agency 2 (stickers plus signature sheets) safety belt use increased from averages of 10.8% and 9.4% during baseline to 57.4% and 47.0%, respectively, during intervention. In Agency 3 (stickers only) the rates of safety belt use averaged 9.7% during baseline and 38.0% during intervention. Some increases in private vehicle use were observed. A substantial reduction in workers' compensation claim costs was shown for the target agencies with some reductions also shown in the nontarget agencies.

DESCRIPTORS: safety belt, prompting, stimulus control, response cost, driving behavior

Efforts to encourage safety belt use have included engineering, education, and mandatory safety belt laws (Geller, Casali, & Johnson, 1980). Some engineering efforts, such as "automatic" safety belts, buzzers, and lights have been circumvented ("The Body Count on the Highway," 1984; Geller et al., 1980). Air bags, which are not readily circumvented, offer good protection to front seat occupants in head-on collisions; however, they are not designed to protect occupants in rear, side, or rollover accidents. Educational programs, such as T.V. and

radio advertisements, billboards, films, pamphlets, and large-scale programs such as Florida's "Arrive Alive," may help to establish an environment that will promote the effectiveness of more direct and individualized programs. By themselves, however, such campaigns have typically met with insignificant results (Thomas & Howard, 1980).

A number of countries now have laws mandating safety belt use (e.g., Australia, Belgium, Canada). Since the introduction of these laws, many countries have experienced dramatic increases in safety belt use (e.g., 20% to 90% in Australia) and concomitant decreases in deaths and injuries in motor vehicle accidents (e.g., 53% reduction in Belgium) (U.S. Department of Transportation, 1976). Many states now have legislation requiring the use of safety belts and child restraints (e.g., New York, Florida).

The natural contingencies for safety belt use may not be strong (i.e., few people will experience escape from injury because few experience serious accidents). Therefore, researchers attempting to promote safety belt use may contrive supplemental contingencies involving incentives (e.g., Elman & Killebrew, 1978; Geller, 1983a, 1983b; Geller,

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Davis, & Spicer, 1983; Geller, Johnson, & Pelton, 1982; Geller, Patterson, & Talbolt, 1982). This approach, however, is often limited by poor maintenance, high implementation costs, and in some cases, high manpower demands in implementation.

Another approach may involve a combination of contracting (or commitment), prompting, and fines for noncompliance. After making a commitment, people are more likely to behave in a manner consistent with their prior agreement, especially when it is active, public, effortful, and uncoerced (Cialdini, 1985; Festinger, 1957; Heider, 1946; Newcomb, 1953). Investigators have used commitment to increase compliance in a variety of educational settings such as college Programmed System of Instruction courses (e.g., Brooke & Ruthven, 1984). Public commitment has also been shown to increase compliance with therapeutic objectives in areas such as addictive disorders (e.g., Donovan, 1984) and family therapy (e.g., Rueger & Liberman, 1984). Such a commitment strategy may be enhanced with the use of prompts. That is, it may be possible to promote safety belt use through written reminders visible to the driver. Even greater compliance might occur if the driver, in the event of an accident, could expect to incur a penalty or fine for failure to use the safety belt.

Based on these considerations, the present study evaluated the use of commitment, prompting, stimulus control, and the establishment of potential negative contingencies for safety belt nonuse. The key components included dashboard sticker prompts and signature sheets outlining the contingencies for nonuse.

## METHOD

### *Subjects*

Subjects were government employees of the state of Florida. Florida currently employs over 110,000 individuals, approximately 26,458 of these drive state-owned vehicles or their private vehicles on state-related business. Injuries sustained by employees as a result of motor vehicle accidents during the period from July 1, 1980 to September 30,

1983 cost the state over \$3 million for medical compensation and indemnity payments, or 13.2% of the total workers' compensation payments during this period (Moore, 1983). Over the last 3 fiscal years, the average workers' compensation claim per employee involved in automobile accidents was \$3,836 compared to the average cost of \$323 for all other types of workers' compensation claims during the same period (Moore, 1983). In addition, two to three deaths among state employees occur each year as a result of motor vehicle accidents.

The three agencies participating in this experiment were located in Tallahassee, Florida, and contained 503, 240, and 150 employees, respectively. The selection of these groups was based on (a) the number of vehicles in each motor pool, (b) the number of drivers, (c) the frequency of motor vehicle accidents resulting in worker's compensation claims, and (d) the average cost per claim resulting from motor vehicle accidents. Compared to the other 29 agencies reviewed, these target agencies had comparable and relatively high levels of these variables, increasing the frequency of target observations.

### *Setting*

The local offices of Agency 1, Agency 2, and Agency 3 were located at least 5 miles apart in different areas of the city. Each was surrounded by a large parking lot. Agency-owned vehicles were parked in designated areas, had yellow "Agency" license plates, and were all equipped with shoulder harness safety belts. Observers positioned themselves in inconspicuous locations near access lanes and intersections leading to each lot.

### *Observation System and Behavioral Definitions*

Observations were conducted during the high-traffic times of the morning (determined from pilot data) for 1-hr periods, approximately 2 or 3 days per week. Data were collected on the type of vehicle and whether the driver was wearing a safety belt. Private vehicle data were not collected at Agency 2 because of the high volume of vehicles passing the observation point during a given session (i.e.,

it was unlikely that any particular private vehicle would necessarily be driven by an Agency 2 employee).

*Safety belt use.* An individual was considered to be wearing a safety belt only if the strap was clearly visible over the shoulder. No attempt was made to observe or score lap restraints because of visual constraints and the fact that all of the target vehicles were equipped with shoulder harnesses.

*Type of vehicle.* The determination of the vehicle type was based entirely on the license plate. The target vehicles were agency-owned and equipped with yellow license plates which clearly displayed the agency initials. All other motor vehicles were considered private unless they were business vehicles (i.e., business name on vehicle), city, county, or federally owned vehicles, three-wheelers, motorcycles, buses, or large trucks, in which cases they were not scored. Vehicles with tinted glass were excluded because safety belt use could not reliably be observed.

### *Reliability*

Interobserver agreement was determined in 48% of the sessions during baseline and 34% of the sessions during intervention. All observers were trained at the site for a minimum of 2 weeks. Training was continued until a criterion of 80% agreement or better was achieved for one full observation session. Of the six observers in this study (other than the experimenter), five remained naive to the experimental conditions and to the nature of the interventions. Reliability was computed using an observation-by-observation agreement method. An agreement required the observers to score identically the vehicle type (target vs. private) and whether or not the driver was wearing a safety belt (occurrence). The number of agreements was divided by the number of agreements plus disagreements and multiplied by 100 to yield a percentage. Occurrence and nonoccurrence reliability in all three agencies averaged 70% and 91% for target vehicles and 80% and 98% for private vehicles during baseline, 98% and 98% for target vehicles and 80% and 96% for private vehicles during intervention,

and 84% and 95% for target vehicles and 80% and 97% for private vehicles, respectively, during the entire study. Occurrence and nonoccurrence reliability measures for individual agencies during the entire study averaged 71% and 91% for target vehicles and 84% and 98% for private vehicles in Agency 1, 84% and 95% for target vehicles in Agency 2 (private vehicle data were not collected), and 98% and 98% for target vehicles and 76% and 96% for private vehicles in Agency 3.

### *Experimental Procedures*

Florida's Workers' Compensation Law (1982) provides that "where injury is caused by the willful refusal of the employee to use a safety appliance or observe a safety rule required by statute or lawfully promulgated by the division . . . the compensation provided in this chapter shall be reduced by 25 percent." The legal counsel to the Department of Insurance, Division of Risk Management agreed with the experimenters that automobile safety restraints constitute "safety appliances" and that in the event of an accident in which the driver was on state-related business, failure to use these restraints may be in violation of the Workers' Compensation Law. To enforce the law, the governor established a mandatory safety belt regulation for state employees; the agencies officially adopted this as departmental policy. The policy was disseminated to employees by executive director memo (i.e., signature sheet).

*Baseline.* Only the contact person (safety coordinator), the director, and the supervisor of the motor pools in each agency were informed of the actual nature of the study. They were carefully instructed concerning the importance of maintaining experimental control (i.e., not informing other agency personnel of the study) and were asked to respond to any inquiries with the statement, "The researchers are interested in studying carpooling." No other information was solicited or given out during any phase of the study. Contact between observers and agency personnel was never reported.

*Dashboard stickers.* A dashboard sticker (10 cm by 7.5 cm) was placed in a vertical position on

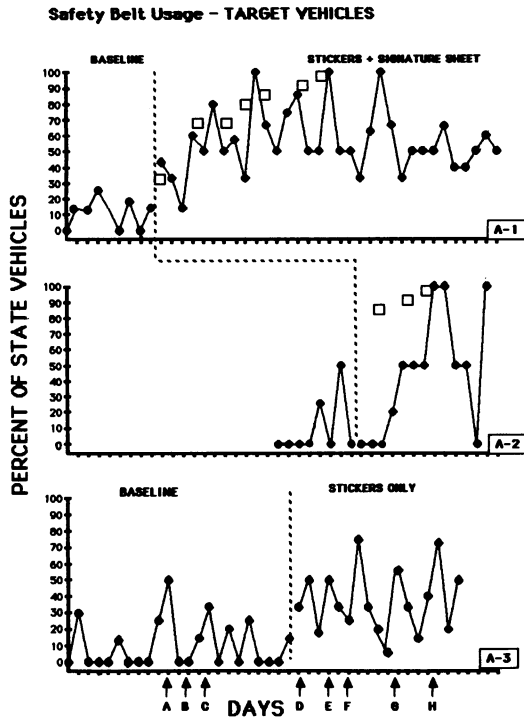


Figure 1. The percentage of drivers of state-owned vehicles observed to be wearing safety belts during each 1-hr observation session. Days in all three agencies represent observation sessions. Agency 1 and Agency 2 received the stickers plus signature sheet intervention; Agency 3 received the stickers only intervention. Open squares represent the cumulative percentage of signature sheets returned each week. Extraneous media events are presented as arrows: (A) Florida Supreme Court ruling that jury damages may be reduced if the victim was not wearing a safety belt, (B) a local editorial outlining the need to use safety belts, (C) General Motors program of free life insurance to victims killed wearing a safety belt, (D) local article outlining cabinet resolution requiring safety belts, (E) local article on New York's safety belt law, (F) local editorial encouraging a Florida safety belt law, (G) article on program to reduce traffic fine if offender was wearing a safety belt, and (H) local editorial on mandatory safety belt law.

the dashboard of all state-owned vehicles of the target agencies to inform occupants of the regulation requiring safety belt use while driving on state-related business and the consequence of a possible 25% reduction in workers' compensation for non-compliance if the driver was involved in an accident. The supervisor of the motor pools, under the direction of the contact person, installed the dashboard stickers in 1 day.

*Dashboard stickers plus signature sheets.* Employees were required to sign a memo containing the regulation and the consequences for non-compliance. No specific contingencies were stated for failing to sign and return the form. The memo carried the signature of the agency's executive director. Each agency had one person who was designated as the safety coordinator for the agency; this individual served as the researchers' contact person. The safety coordinator disseminated the forms to all agency employees over a period of 1 week and also collected the returned forms. Agency 1 required 5 weeks to achieve their maximum return rate and Agency 2 required 3 weeks.

### *Experimental Design and Conditions*

A modified multiple baseline design across two agencies was used to assess the effects of the dashboard stickers and signature sheets. In addition, a third agency implemented a "stickers only" condition. This permitted an assessment of this single component of the intervention. Agencies were assigned to one of the three groups based on their willingness to implement one or both components of the intervention.

## RESULTS

### *Drivers of State-Owned Vehicles*

Figure 1 shows the percentage of drivers of state-owned target vehicles observed to be wearing safety belts during the 1-hr observation sessions. Prior to the implementation of the stickers plus signature sheets procedure, 10.8% and 9.4% of the drivers used safety belts in Agency 1 and Agency 2, respectively. After both components were implemented, safety belt use increased to an average of 57.4% in Agency 1 and 47.0% in Agency 2. Also included in Figure 1 is the cumulative percentage of signature sheets signed and returned each week (represented by open squares); Agency 1 and Agency 2 achieved return rates of approximately 99% and 90%, respectively. A stickers-only intervention was implemented with Agency 3. The rates of safety belt use averaged 9.7% during baseline and in-

creased to 38.0% when the sticker prompts were placed in the target state-owned vehicles.

### *Drivers of Private Vehicles*

In Agency 1 and Agency 3, data were collected on the percentage of drivers of privately owned vehicles observed to be wearing safety belts during the 1-hr observation sessions (see Figure 2). The rates of safety belt use in Agency 1 averaged 11.6% during baseline and 15.8% during the intervention phase of the study. In Agency 3 safety belt use averaged 9.4% during baseline and 18.3% during the intervention phase.

## DISCUSSION

Results of this study indicate that employees driving on state-related business can be encouraged to increase their use of safety belts. The program was implemented at a very low cost, with relatively little manpower, and the increase in safety belt use, although variable, endured over a 5-month period. Use of both the stickers and signature sheets resulted in substantial increases in safety belt use. Dashboard stickers alone also resulted in modest increases in safety belt use.

As reported earlier, the Workers' Compensation Law of Florida provides for a 25% reduction in benefits to employees contingent upon refusal to use a safety appliance. It should be noted that there were no opportunities for enforcement during this study.

Agency 3 was unwilling to implement the signature-sheet component at the time of the intervention. As a result, a dashboard sticker-only group was created, and Agency 2 was included in the study. This may have improved the study by allowing for a partial assessment of the individual components. These results and the scope of this study do not permit a definitive conclusion to be made regarding the importance of signature sheets, but they do suggest that the signature-sheet component may be valuable under some circumstances.

One point of interest to the researchers was whether any increase in safety belt use among employees in state-owned vehicles would generalize to

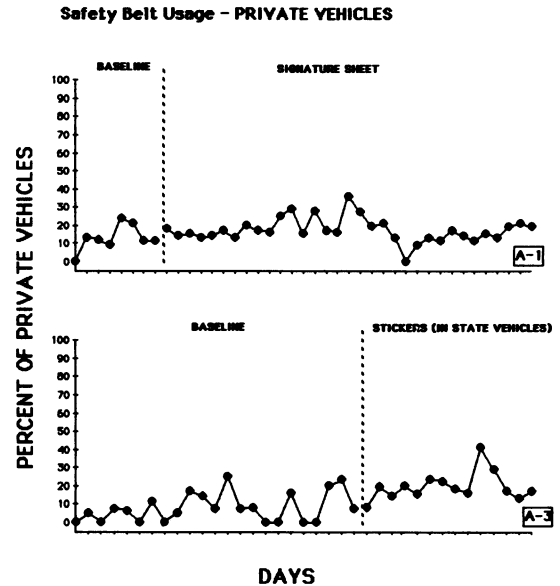


Figure 2. The percentage of drivers of privately owned vehicles observed to be wearing safety belts during each 1-hr observation session. Days in all three agencies represent observation sessions. Agency 1 received the stickers plus signature sheet intervention; Agency 3 received the stickers only intervention. Private vehicle data were not collected for Agency 2.

their privately owned vehicles. The settings for Agency 1 and Agency 3 allowed observation of private vehicles entering and exiting parking lots. The rates of safety belt use for private and state vehicles were comparable during baseline. After intervention, the changes in the safety belt use in private vehicles were negligible.

One of the pitfalls of applied research is the difficulty involved in controlling extraneous variables. Throughout the duration of this study, several events occurred that received media attention (see Figure 1), including (a) the Supreme Court of Florida ruled juries may reduce damages awarded if traffic accident victims were not wearing safety belts, (b) the General Motors Corporation began giving new car owners insurance certificates that pay the estate of a driver who dies in an automobile crash while wearing a safety belt, (c) several articles were published in the local paper regarding the possibility of a mandatory safety belt law in Florida, and (d) the state of New York passed a mandatory

safety belt law. A direct effect attributed to these events seems unlikely because the events were spread throughout baseline and intervention phases and no noticeable changes in safety belt use were noted (see Figure 1), only minimal changes in private safety belt use were observed during the entire study, and increases in safety belt use corresponded with the implementation of the interventions in all three agencies.

Some researchers (e.g., Winkler & Winett, 1982) have stressed the importance of contextual factors in behavioral interventions. Contextual factors certainly could have played some role in the present study. First, the general public interest in safety belts and government budget reduction may have produced an attitude of greater acceptance. Second, the existence of potential negative contingencies (i.e., 25% reduction in benefits) and easily identifiable accident victims are likely to add to the effectiveness of the prompts and stimulus-control intervention. Finally, the general authority structure of government agencies increases the probability of implementation and compliance; one may not expect these results to be replicated in settings where this structure is not present.

The goal of any safety belt program is not only to encourage use but also to reduce injuries and deaths. It is of interest to note that during the last week of the study, two employees from the local offices of Agency 1 were involved in accidents. In both cases, the employees were driving state-owned vehicles with dashboard stickers and were on state-related business. In addition, both vehicles were damaged beyond repair, but both employees were wearing safety belts and were virtually uninjured. In fact, each returned to work the next day.

Follow-up data on the average cost per claim for automobile accidents in target and nontarget agencies were collected for a 2.5-year period following the program and compared to the cost data for the 6-year period preceding the program. The average reduction in costs per accident for all target agencies was more than twice that in the nontarget agencies (\$2,100 vs. \$975). These data should be interpreted with caution. The large cost reduction may reflect the prevention of catastrophic claims

(i.e., outliers) in the target agencies (B. Moore, personal communication, August 21, 1987). Such claims may appear sporadically and, as a result, disproportionately affect the claims for a particular period; however, programs such as this may serve to prevent such catastrophic injuries. Another point to consider is that all state agencies were encouraged by the Division of Risk Management to implement this program upon termination of the study. Although some agencies reportedly complied, no reliable check was made and full compliance is questionable (B. Moore, personal communication, August 21, 1987). Some of the cost reductions in nontarget agencies could be attributed to a partial implementation of this program.

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