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Long-Term Effects of Employer-Based Programs to Motivate Safety Belt Use

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16. Abstract: This report reviews the procedures and results of 28 different programs that increased employees' use of vehicle safety belts at ten work settings (with 141 to 6,727 employees) ranging from a minimum long-term gain of 12% over baseline to a maximum gain of 285%. A total of 244,543 vehicle observations were made to assess shoulder belt use before, during, and after particular behavior change strategies. Several program evaluations included follow-up observations from six months to 18 months after the safety belt campaign ended. Four basic types of employer-based programs were compared with regard to both immediate and long-term impact, including: 1) direct and immediate rewards, 2) direct and delayed rewards, 3) indirect and delayed rewards, and 4) awareness/commitment strategies that involved no extrinsic rewards. Each program was practical for its particular location and substantially increased the wearing of safety belts by targeted employees. In fact, only the indirect programs failed to double safety belt use, at least over the short term (i.e., a month or so). Safety belt use declined markedly when the programs were terminated but post-program levels rarely got as low as pre-program baseline. In other words, long term residual effects were found for practically every program, and consistent with theories of intrinsic motivation and minimal justification, the amount of residual impact was greater for those programs that did not involve extrinsic rewards. Five conclusions are particularly important and provocative: 1) Safety belt use can be prominently increased at corporations and institutions with practical cost-effective procedures, 2) Significant residual effects of safety belt promotion remain long after program termination, 3) Gains in safety belt use can be increased with intermittent programs, 4) Further research is needed to determine optimal scheduling of various program strategies for response maintenance and generalization, and 5) Advantages and disadvantages of using extrinsic rewards vs. no rewards for safety belt promotion requires special programmatic attention.

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Preface

The advice, encouragement, and support of many individuals and organizations over the past several years made the research reviewed in this document possible. Invaluable, of course, was the initial research support of General Motors Research Laboratories, concomitant with helpful suggestions from Walter A. Albers, Jr., and Calvin R. von Buseck of the Societal Analysis Department at the GM Research Laboratories. Subsequent research funding from the U.S. Department of Transportation (DOT Contracts DTRS5681-C-0032 and DTRS57683-C-0050) allowed for comprehensive testing of the behavior change strategies reviewed in this document. Useful guidance and reinforcement were provided by four DOT contract monitors in the Office of Driver and Pedestrian Research, National Highway Traffic Safety Administration: Bruce Bigelow, David Sleet, Mike Smith, and Doug Gurin. Additional support for our safety belt research has come from the Virginia Division of Motor Vehicles (Grant DE84-5-58005).

The follow-up research of the programs reviewed in this document was supported by Contract DTNH-22-85-C-07301 from the National Highway Traffic Safety Administration. Dr. Doug Gurin was the COTR for this project and his continual advice and encouragement were invaluable.

From our early demonstration projects to current large-scale application, many individuals presented my students and me with constructive challenges that resulted in program refinements and innovative procedures (e.g., among those not already mentioned were Jim Nichols, Adele Spielberger, Diane Steed, Bill Tarrants, and Dean Van Gordon of the National Highway Traffic Safety Administration; Brian O'Neal and Adrian Lund of the Insurance Institute for Highway Safety, Chuck Hurley of the National Safety Council, Barry Sweedler of the National Transportation Safety Board, John Kello of Davidson College, and John Cope of East Carolina University).

Over the past eight years many friends, colleagues, and students have provided invaluable support, insight, and hard work with the research projects reviewed in this report. Indeed, without the thousands of daily observations of safety belt use by Virginia Tech students, the research reviewed in this document would not have been possible.

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Executive Summary

This report summarizes the procedures and results of 28 employer-based, safety belt programs conducted at a large university with 6,727 employees (i.e., Virginia Tech) and at nine different corporations (with 141 to 1,600 employees) located in Blacksburg, Christiansburg, and Radford, Virginia (N = 6) and in Cornelius and Greenville, North Carolina (N = 3). Each of the programs was evaluated with safety belt observational procedures before, during, and after a particular intervention strategy was implemented. A total of 244,543 vehicle observations were made to assess intervention impact. Four program evaluations included follow-up records obtained a year or more after the corporate buckle-up campaigns had ended.

Four basic approaches to increasing employee safety belt use were compared with regard to both immediate and long-term benefits, including: 1) direct and immediate rewards ("Direct"), 2) direct and delayed rewards ("Delayed"), 3) indirect and delayed rewards ("Indirect"), and 4) awareness/commitment strategies that involved no extrinsic rewards ("No Reward"). For the Direct approach, vehicles were stopped upon entering or exiting the site, and drivers who were buckled up were offered small prizes or lottery coupons for reward games or prize drawings. A Delayed reward strategy was used when it was inconvenient or unsafe to stop vehicles, and involved recording license plate numbers of vehicles with buckled occupants and a subsequent selection of prize winners. The Indirect reward approach was most feasible at large corporations when vehicles could not be conveniently stopped nor selected randomly for reward opportunities. For this approach, vehicle occupants were not rewarded directly for being buckled up, rather employees were offered an incentive for signing a "buckle-up" pledge card that committed the signer to use vehicle safety belts for a particular period of time.

In contrast to the incentive/reward strategies, the No Reward intervention did not provide extrinsic rewards for using a safety belt nor for making a buckle-up commitment. For five of the six No Reward programs evaluated, the value of using safety belts during all vehicle travel was discussed in small interactive group meetings. After the group discussion, buckle-up pledge cards were distributed and employees were urged to sign them, thereby making a commitment to use safety belts for a specified period of time. Another No Reward approach involved a student displaying a sign that read "PLEASE BUCKLE UP -- I CARE" to unbuckled drivers of vehicles exiting a parking lot. If the driver buckled up, the "flasher" flipped the card over to display the message, "THANK YOU FOR BUCKLING UP". Drivers who were already using a safety belt were only shown the "thank you" side of the flash card.

Each safety belt program was practical for its particular location, and could have been implemented by indigenous personnel. Every program increased the use of safety belts by the targeted employees, at least doubling baseline belt use levels over the short term (i.e., a month or so). After the reward programs terminated, employees did reduce their use of safety belts immediately, but post-program safety belt use rarely decreased to the pre-program baseline. In other words, some long-term residual effects were found for each safety belt program.

Comparisons between the four basic types of employer programs (i.e., Direct, Delayed, Indirect, and No Reward) showed equivalent impact during the intervention period (with each approach increasing baseline belt use by a mean of 12 to 15 percentage points). However, the No Reward approach was the most effective after the intervention ended and the one No Reward program that was evaluated over the long term showed a marked residual effect. This finding is consistent with theories of intrinsic motivation and minimal justification, which are discussed in the report.

Five conclusions set the stage for further research, intervention, and dissemination.

- Safety belt use can be increased substantially at corporations and institutions with practical, cost-effective procedures.
- Notable residual effects of safety belt promotion remain long after program termination.
- Gains in safety belt use can be increased with intermittent programs.
- Further research is needed to determine optimal scheduling of various program strategies for response maintenance and generalization.
- Advantages and disadvantages of using extrinsic rewards versus no reward for safety belt promotion requires special programmatic attention.

Introduction

Programs to increase employee attendance, work output and on-the-job safety are common and relate to a prime goal of American industry -- the maintenance of profits. Recently many employers have become aware of the excessive financial liabilities associated with vehicle crashes. It has been estimated, for example, that each employee fatality costs industry $120,000 in direct payments, including fringe benefits, property damage, and medical care; and it would take $2,400,000 in sales at a five percent margin to offset this loss (Pabon, Sims, Smith & Associates, 1983). Moreover, this estimate of direct cost does not include the financial liabilities due to plant disruption and productivity losses concomitant with hiring and training a replacement.

There is conclusive evidence that the use of a safety belt (i.e., the shoulder and lap-belt combination) reduces the probability of death or serious injury following a crash by 55% or more (Federal Register, 1984). Thus, corporations and government institutions are finding that it is good business to promote safety belt use among their employees (Bigelow, 1982; Geller, 1982). A survey at Ford Motor Company, for example, showed that during a five-year period (1979-1984), a total of 367 Ford employees were killed in vehicle accidents, compared to the death of 22 Ford employees from on-the-job accidents (Gray, 1986). Consequently, in the Spring of 1984, Ford Motor Company launched a companywide, long-term program to promote safety belt use; and in one year it was estimated that the increased use of safety belts among Ford employees (i.e., up to 50% belt wearing) saved the lives of at least eight individuals, spared about 400 others from serious injury, and reduced corporate costs by about 10 million dollars (Gray, Bohan, & Geller, 1985). The continued promotion of safety belt use at Ford has saved the lives of at least 25 Company employees and reduced serious injuries to more than 900 employees. Ford Motor Company's promotion of safety belt use has resulted in a 22 million dollar savings (Gray, 1986).

Berg Electronics, an E. I. Du Pont subsidiary, has maintained a safety belt campaign since 1980 at a cost of $10,000 per year for 800 employees. In the first year of the program, employee safety belt use increased from 46% to 90%. Consequently, one virtually certain fatality was avoided and six employees in other vehicle accidents escaped injuries because they were buckled up (Spoonhour, 1981). The total lost work days for the year was reduced by 74% from the prior year, thus

saving approximately 337 workdays and $27,000 in disability pay.

Documents and manuals describing the necessary steps to develop a successful safety belt program are currently available (Campbell, Hunter, Stewart, & Stutts, 1982; Campbell, Marchetti, Gemming, & Hunter, 1984; Geller, 1982, 1985; Geller & Bigelow, 1984; National Highway Traffic Safety Administration, 1985; Richardson & Race, 1984). These manuals stress the same basic components for a successful employer-based safety belt program, including:

- active and visible commitment on the part of management to a long-term safety belt program
- a clearly defined and well enforced policy of mandatory, on-the-job safety belt use
- incentive strategies to initiate safety belt use and maintain the "buckle-up" habit
- a comprehensive safety belt education program
- systematic record keeping of vehicle accidents that includes the use vs. non-use of safety belts
- ongoing safety belt promotion within the company
- periodic assessment of employee safety belt wearing to demonstrate progress toward belt use goals
- an outreach effort to extend safety belt promotion beyond the workplace --especially to the family

Usually a long-term safety belt program or corporate belt-use policy is contingent upon an initial safety-belt campaign that attracts companywide attention (including that of top management) and significantly increases safety belt use on the plant premises. A prominent component of the particularly successful programs (at least over the short term) was an incentive strategy (see review by Geller, 1984). Such incentive approaches have usually followed one of three basic formats:

1. Direct and Immediate Rewards --Vehicles are stopped when entering or exiting the plant and prizes or lottery coupons are offered immediately (i.e., on-the-spot) to drivers using a safety belt (e.g., Campbell, Hunter, Stewart, & Stutts, 1982; Geller, 1983; Geller, Davis, & Spicer, 1983; Spoonhour, 1981).

2. Direct and Delayed Rewards --Shoulder belt use is observed while vehicles are entering or exiting the plant and, without

stopping vehicles, license plate numbers of vehicles with buckled occupants are recorded. Later, prizes are awarded to winners selected at random from the pool of license numbers (e.g., Geller, 1984; Geller & Hahn, 1984).

3. Indirect Rewards --Prizes or lottery coupons are offered when employees make a formal commitment to buckle up, for example, by signing a "buckle-up" pledge card (e.g., Cope, Grossnickle, & Geller, 1986; Geller, Kalsher, Rudd, & Lehman, 1986; Horne & Terry, 1983).

A fourth strategy for promoting safety belt use, termed No-Reward, combines both educational awareness and pledge-card commitment. The value of employee safety belt use is discussed in small group interactive "awareness sessions." Buckle-up pledge cards are distributed at the end of the session and employees are urged to sign the cards, thereby making a commitment to use their safety belt consistently for a specified period of time. Recent research has found this technique to increase safety belt use as successfully as the three incentive strategies outlined above (Cope, Grossnickle, & Geller, 1986; Kello & Geller, 1986).

Another strategy to increase employee safety belt use is for the policy makers in a given work setting to announce a "requirement" or policy that safety belts be worn whenever employees drive on the premises in either public or personal vehicles. Such a policy may be in effect during any driving that is related to employment.

It is noteworthy that all of the research that demonstrated the efficacy of "immediate reward", "delayed reward", "indirect reward", and "no reward" programs for safety belt promotion were essentially short-term demonstration projects. Although all evaluations included direct observations of employee safety belt use before, during, and after the behavior change intervention, the durations of the intervention phases were relatively short; and except for Geller (1984), follow-up observations were either nonexistent or minimal. Thus, while it is clear that these techniques were effective in at least doubling the baseline level of employee safety belt use, there is little published information regarding the long-term impact of these interventions.

The present summary of 28 employer-based safety belt programs includes comparisons among direct, delayed, indirect, and no reward programs with regard to both immediate and long-term impact on employee safety belt use. The programs were conducted at nine different corporations located in Blacksburg, Virginia (N = 3), Christiansburg, Virginia (N = 1), Radford, Virginia (N = 2), Cornelius, North Carolina (N = 2), and Greenville, North Carolina (N = 1). All of these programs were evaluated with observational procedures that included appropriate checks for inter-rater reliability, and measures of program impact occurring immediately af-

ter the intervention was withdrawn and sometime later during "follow-up" observations. Four programs included follow-up records obtained a year or more after the corporate buckle-up campaign had ended. These follow-up observations were conducted especially for this summary evaluation study.

Method

Subjects and Setting

The subjects were approximately 11,800 employees who were observed wearing or not wearing a shoulder belt at any one of nine different corporations from 1981 to 1986. The corporations, locations and sizes (with regard to numbers of employees) were as follows: (1) Corning Glass Works, Blacksburg, VA (220 employees); (2) Radford Community Hospital, Radford, VA (520 employees); (3) Federal Mogul, Blacksburg, VA (525 employees); (4) Harvey Hubbell Lighting, Christiansburg, VA (539 employees); Virginia Polytechnic Institute and State University, Blacksburg, VA (6,727 employees); (5) Radford Army Ammunition Plant, Radford, VA (1,600 employees); (7) Burroughs Wellcome, Greenville, NC (1,400 employees); (8) Reeves Brothers/Curon Plant, Cornelius, NC (141 employees); and (9) Reeves Brothers/Carolina Plant, Cornelius, NC (160 employees). Neither Virginia nor North Carolina had mandatory safety belt use laws during any of the data collection periods.

Each corporation employs both blue and white-collar workers. At two plants (Federal Mogul and Hubbell Lighting) it was possible to obtain separate safety belt use data for the two types of employees, because the plants had different parking lots for blue and white-collar workers. At the university setting, observations of faculty/staff were separated from observations of students by either recording vehicle parking stickers which were different colors for faculty/staff vs. students, or by recording vehicle license plate numbers and using a computer listing of all registered campus vehicles to partial out the faculty/staff vehicles. Therefore, the university data (as well as most of the corporate data) were a combination of blue-collar (i.e., hourly) and white-collar (i.e., salary) employees.

Observation Schedules and Procedures

Each safety belt program reviewed in this report can be divided into phases called baseline, intervention, withdrawal, and follow-up, respectively. During the baseline period, safety belt use was observed as unobtrusively as possible. The purpose of baseline was to establish the level of safety belt use prior to the introduction of an intervention. After sufficient baseline data had been collected, the intervention phase began. The duration of this period depended on the type of intervention used. Data collected during the intervention period showed the impact (if any) of the treatment. The withdrawal phase began when the intervention was terminated. Observation of safety belt use during withdrawal revealed whether the treatment effect lasted beyond the time of active program promotion and participation. Follow-up data provided information regarding the permanence of an observed change in safety belt use. Long term follow-up was assessed, on

average, nine and a half months after termination of an intervention (range: 1 to 30 months).

As vehicles entered or exited the parking lots of the corporations or traveled across the large campus of Virginia Tech, one or two observers independently recorded whether a shoulder safety belt was available in the driver's seat and whether the driver was using the safety belt. At Burroughs Wellcome and Virginia Tech the gender of the driver was also recorded. No attempt was made to observe every vehicle. After completing the data recording of a particular vehicle, the observer targeted the next available vehicle for observation. Sometimes communication occurred between observers to clarify which vehicle they were observing. This was especially necessary when a continuous flow of traffic made discrimination difficult. On rainy days, researchers observed from a car parked near an entrance/exit or from inside the "gate house" (i.e., at Radford Army Ammunition Plant).

The present review identified 28 employer-based safety belt programs conducted by the principal investigator and his research team at nine sites in Virginia and North Carolina. The size of the Radford Army Ammunition Plant made it possible to conduct entirely independent programs at two of the plant's gates. Thus, this report summarizes the results of programs at ten independent locations at nine different worksites. In all, 258,315 total vehicle observations were made by primary observers. Another 187,650 observations were made by secondary observers to assess inter-observer reliability. Thus, more than 445,000 vehicle observations were made to evaluate the effectiveness of the programs described herein.

For more than 75% of the 258,315 vehicle observations summarized in this report, two researchers made independent observations and data recordings. Indices of inter-observer agreement were calculated by dividing the number of times the two observers agreed on a particular category (i.e., shoulder belt available, shoulder belt not available, belt worn, belt not worn) by the total number of paired observations made on that category, and then multiplying the quotient by 100% in order to convert to agreement percentages. For all of the data summarized in this report, inter-observer reliability exceeded 95% agreement.

Interventions

Each intervention was designed to be practical for the particular setting in which it was used. Although in every case except the campuswide programs at Virginia Tech, the interventions were implemented and evaluated by researchers from the nearby university, the interventions could have been readily implemented by indigenous plant personnel. The financial costs (e.g., for the incentives) of every program were covered by the organization it-

self or by donations from local merchants. All interventions can be categorized according to the general scheme described earlier (i.e., direct rewards, delayed rewards, indirect rewards, and no rewards), however, the specific implementation strategies varied. Since these techniques may have particular aspects applicable to other corporate or community settings, the different implementation tactics are summarized below.

Direct and Immediate Rewards

1. Incentive Flyers (Corning Glass Works, Federal Mogul, Hubbell Lighting, Radford Army Ammunition Plant and faculty/staff parking lots on the Virginia Tech Campus) -- Drivers entering or exiting parking lots were signalled to stop and handed an incentive flyer. As shown in Figure 1 on page 8, these flyers prompted seat belt use and described a "combination game" in which certain combinations of symbols printed on each flyer could be exchanged for specific prizes. Drivers wearing a lap and/or shoulder belt received a flyer with a valid game symbol, whereas unbuckled drivers were given a flyer without a valid symbol and with the added message, "NEXT TIME WEAR YOUR SEAT BELT AND RECEIVE A CHANCE TO WIN A VALUABLE PRIZE." The back of the incentive flyers displayed the logos of local merchants who contributed prizes.

2. $5 for Pledge Display and Belt Use (Radford Community Hospital) -- Workers received buckle-up pledge cards and instructions at 20-min. "awareness sessions" and in pay envelopes. To be eligible for the weekly direct reward of $5 or the monthly $25, drivers entering or exiting the staff parking lot had to be buckled up and have a signed buckle-up pledge card displayed on the dashboard of their vehicles. Winners were determined by randomly choosing a day and time within the arrival or departure times for most employees, and then flagging the first driver after the selected time who met the contingencies for reward eligibility.

3. Meal Coupons (Federal Mogul) -- Coupons redeemable for a hamburger at a nearby fast food restaurant were handed to drivers who were buckled up while exiting the parking lot for blue-collar employees. The coupons were donated by a restaurant which sold lunch to many plant employees.

Direct and Delayed Rewards

1. License Plate Lottery (Burroughs Wellcome, Federal Mogul, Hubbell Lighting, Radford Army Ammunition Plant) -- Winning license plate numbers were randomly selected from those vehicles entering or exiting the plant with drivers wearing a shoulder safety belt. Then, winning numbers and locations for claiming rewards were posted on employee bulletin boards or in the plant

FIGURE 1. EXAMPLE OF AN INCENTIVE FLYER TO PROMOTE SAFETY BELT USE.

CONTEST RULES

1. As you collect these fliers, you may become eligible to win a valuable prize.
2. See the possible combinations of winning symbols on this page.
3. There is no limit to the number of times you can win.
4. You may present your winning combination at 5100 Derring Hall and claim your prize.

Sample List of "Hands" with Corresponding Prizes

1) Three of one symbol . . .
   Surprize package worth at least $1.00
2) Four of one symbol . . .
   Prize valued between $2.00 and $4.00
   (e.g.,a free sub, a plant, a tee shirt)
3) Three of one symbol, two of another . . .
   Prize valued between $5.00 and $10.00
   (e.g.,a gift certificate from Harvey's Warehouse, Mish-Mish, Blue Ridge Mountain Company, Woolco)
4) One of each symbol . . .
   Dinner for two at a local restaurant.
5) Five of one kind
   Prize valued over $15.00
   (e.g., an oil change and lube job, a $25.00 gift certificate from the Possibility)

newspaper. The most convenient way to determine winners was to select a random time within certain observation periods, and then after that time record the license plate number of the first vehicle whose driver was buckled up.

A more involved procedure for selecting winners, with the advantage of including group pressure to buckle up, was implemented at Federal Mogul and Hubbell Lighting. Specifically, a license plate number was entered into the weekly raffle for each buckled occupant seen in that vehicle during daily morning arrival and afternoon departure. The amount of cash awarded to the single winner each Monday was determined by the average safety belt use of the winner's work group (i.e., blue-collar vs. white-collar employees) during the week preceding the raffle. Specifically, $1 was awarded for every percentage point of average safety belt use. If, for example, the mean safety belt use for blue-collar workers was 47% and the winner was a blue-collar worker, the cash award was $47.

2. License Plate Lottery (Virginia Tech) -- At the middle of each academic quarter for one year, posters, radio announcements, newspaper articles and flyers placed under vehicle windshield wipers announced the campuswide "Seatbelt Sweepstakes" whereby students, faculty and staff were urged to "get caught buckled up" by the campus police. Whenever it was convenient during daily duties, the 22 regular police officers and 30 student auxiliary police across three work shifts recorded on data sheets the license plate numbers of vehicles whose drivers were wearing shoulder belts. Ten winners were randomly selected on three consecutive Mondays per quarter in public drawings by prominent leaders in the campus community. Winning license plate numbers were published in campus newspapers and announced by local radio stations.

Indirect Rewards

Pledge Card Lottery (Virginia Tech) -- Pledge cards with instructions for periodic pledge card lotteries were distributed on campus by placing them under vehicle windshield wipers. Pledge cards, raffle "deposit boxes", and promotional posters (see Figure 2 on page 10) were located at the sites of merchants who contributed prizes for the raffles and in several campus buildings (e.g., student union, faculty/staff motor pool, book store, library, classroom buildings, and campus police department). Each academic quarter, public prize drawings were held on three consecutive weeks. Prize winners were drawn from the pool of "buckle-up" pledge cards turned in. Also, owners of vehicles with the upper portion of the pledge card hanging from the inside, rear-view mirror (as a "buckle-up" reminder) were eligible for prize coupons placed intermittently under vehicle windshield wipers by campus

FIGURE 2. A POSTER DESCRIBING THE SPECIFICS OF THE VIRGINIA TECH PLEDGE CARD SWEEPSTAKES.

TECH POLICE SAY

'Take the Pledge' to enter

PLEDGE CARD SWEEPSTAKES 1

In conjunction with . . .
Virginia Tech
Circle K

- **Who?**
  Anyone Driving on Campus
- **When?**
  May 1st until May 31st
- **How?**
  Fill out a pledge card and display the stub on your inside rear view mirror.
- **Why?**
  2 ways to win $20 to $500 in prizes
  - Weekly drawings from pledge card entries
  - Prizes given out randomly by Tech Police to cars displaying pledge cards

police. Sweepstakes winners were announced in local newspapers, and on radio and television.

No Reward

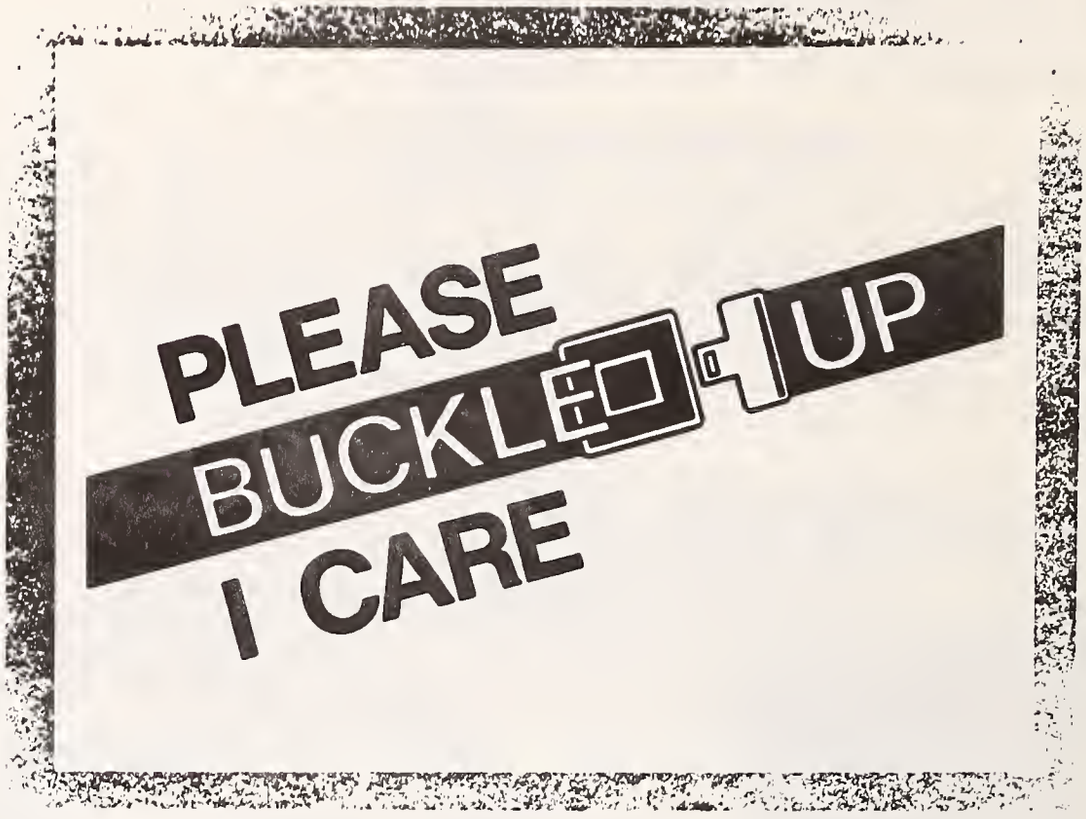
1. Awareness/Commitment (Burroughs Wellcome, Reeves Brothers) -- A 3-min. film illustrating the value of safety belt use was shown at the start of 20-30 min. group meetings. Then a group leader facilitated active discussion among the group of 15 to 30 employees with the lead-in theme of: "What's holding you back from not buckling up?" "Buckle up" pledge cards were distributed and the participants were urged to sign them, thereby agreeing to use their safety belt consistently for a specified period of time (i.e., from one to three months).

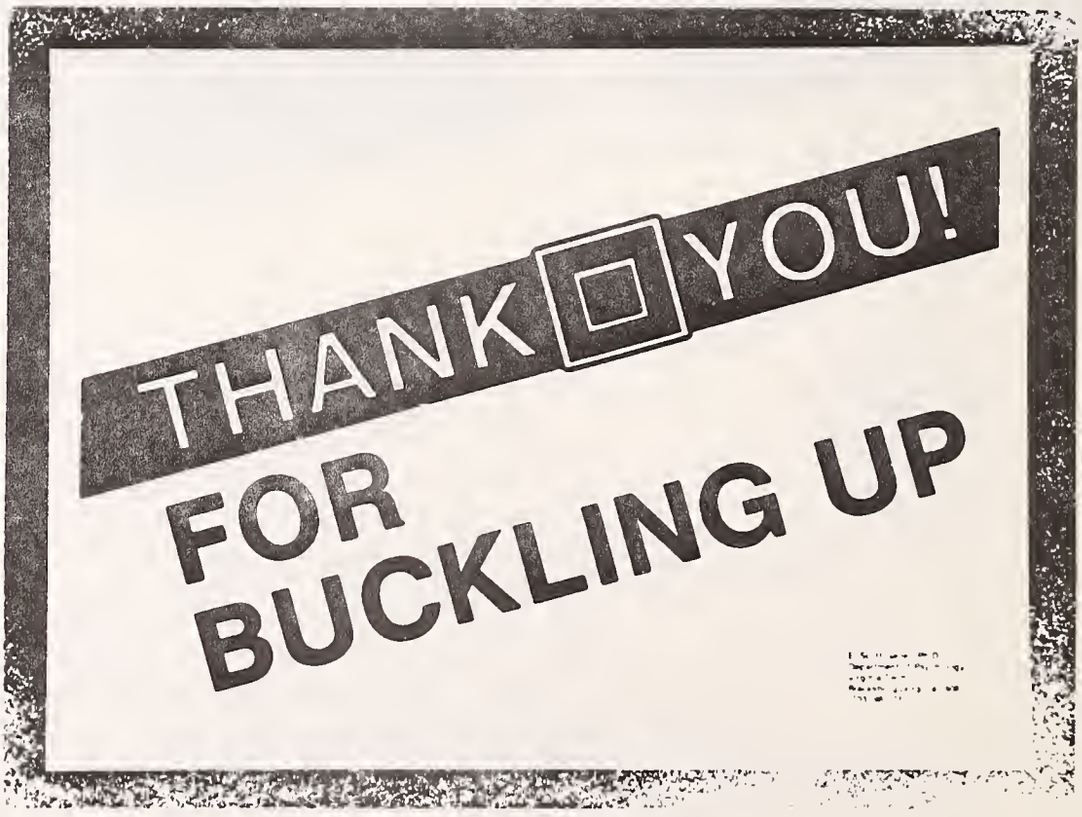
2. Flash Card Prompt (Reeves Brothers) -- A student displayed an 11 x 14 in. flash card that read, "PLEASE BUCKLE UP -- I CARE" to unbuckled drivers of vehicles exiting the plant parking lot. If the driver buckled up, the "flasher" flipped the card over to display the message, "THANK YOU FOR BUCKLING UP". Drivers already using a safety belt were only shown the "thank-you" side of the flash card. The front and back of the flash card are shown in Figure 3.

Policy

Policy programs were implemented at Virginia Tech and at Radford Army Ammunition Plant, and essentially consisted of written memos distributed to work supervisors specifying a requirement that "seat belts" be worn whenever driving on plant or university premises in either government or personal vehicles. Enforcement contingencies were not specified, and we could not find evidence of any punishment contingency used if a driver was caught unbuckled.

FIGURE 3. FRONT AND BACK OF THE 11 X 14 INCH FLASH CARD USED TO PROMPT EMPLOYEE SAFETY BELT USE.





Results

The findings of these 28 program implementations are summarized in Appendices A to I. Each one reveals: (1) location of the intervention; (2) number of employees at each intervention site; (3) starting dates and length of each baseline, intervention, withdrawal, and follow-up phase; and (4) number of observations made during each experimental phase along with the mean percent shoulder belt use by the employees during each program phase.

Table 1 (on page 15) summarizes 23 safety belt programs, showing the overall average percent change in safety belt use as a function of intervention strategies. Five programs were excluded from this summary table because they were essentially sequential implementations of identical safety belt programs. Specifically, the license plate lottery conducted on the Virginia Tech campus was repeated each quarter (3 times) during the 1983-1984 academic year, and the pledge card lottery at Virginia Tech was repeated twice (Spring and Fall, 1985). Only the first occurrence of these programs was included in this summary. Additionally, the non-contingent symbols lottery (Direct and Immediate Reward) at Virginia Tech in the Summer of 1980 was also omitted, since it occurred simultaneously with another symbols game that was delivered contingent on safety belt use. Finally, a flash card prompting intervention program at Reeves Brothers (Carolina Plant) was directly followed by a second flash card program. Only the first occurrence of this program was included in this summary. Eliminating repeated programs allowed a more representative assessment of the actual impact of each intervention strategy.

As shown in Table 1, the 23 interventions were implemented and evaluated at 10 locations. (Twenty-one of these programs assessed baseline safety belt use.) The net percent gain in safety belt use from baseline to intervention (for the 21 programs) was 127%, indicating that the programs more than doubled baseline safety belt use. This finding supports the overall effectiveness of these employer programs, at least over the short term.

Seventeen programs assessed safety belt use during a withdrawal period immediately after the intervention ended. The percent increase in safety belt use from initial baseline level to withdrawal of these programs was 118%, providing evidence that the impact of the interventions lasted beyond discontinuation.

Twelve programs assessed safety belt use during a long-term follow-up period. These follow-up observations were made between one month and two and a half years after program implementation ($\underline{M}$ = 9.5 months), and showed support for the longevity of program

Table 1

Overall Average Percent Change
in Observed Employee Safety Belt Use Over Time
at Ten Employement Locations

Percent Change (Net Gain)

	BASELINE TO FIRST INTERVENTION	BASELINE TO WITHDRAWAL	BASELINE TO FOLLOW-UP
Across All Corporate Locations	**127%**	**118%**	**52%**
(n = 244,543)	(n = 223,023)	(n = 199,335)	(n = 171,437)
23 Interventions	21 Interventions	17 Interventions	12 Interventions

effectiveness. Safety belt use during long-term follow-up averaged 52% above initial baseline levels. In summary, each of the 23 interventions reviewed increased workers use of vehicle safety belts.

Table 2 summarizes the impact of the most successful intervention at each location. The collective impact of these programs to increase employee's safety belt use is summarized in three ways.

- "Net Gain 1" represents the mean absolute increase in the percent of safety belt use from initial baseline to the intervention period. This outcome data was calculated by dividing the absolute percent increase in safety belt use from baseline to intervention by the initial baseline level, thus providing a measure of the initial effect of each safety belt program.

- "Net Gain 2" represents the percent change from mean safety belt use during baseline to withdrawal (i.e., the period of time immediately after the safety belt program terminated). For these calculations, the absolute percent change in safety belt use from baseline to withdrawal was divided by the initial baseline safety belt use [e.g., (20% - 10%)/10% = 100%]. Therefore, any increase in safety belt use above the baseline rate could be considered a short term, lingering effect of the behavior change program.

- "Net Gain 3" is the most conservative estimate of program impact. For this calculation, the percent change in

Table 2

Employee Safety Belt Use:
Summary of Short and Long-Term Program Intervention Effects
at Ten Sites

EMPLOYER	INITIAL BASELINE BELT USE	INTERVENTION BELT USE	WITHDRAWAL BELT USE	FOLLOW UP BELT USE	NET GAINS[1] 1	2	3
CORNING GLASS WORKS BLACKSBURG, VA	10% April 1981	25% May 1981 Direct/Immed.	20% June 1981	11% July 1981	150%	100%	10%
RADFORD COMMUNITY HOSPITAL RADFORD, VA	16% March 1984	35% April 1984 Direct/Immed.	26% May 1984	28% April 1986	119%	63%	75%
FEDERAL MOGUL BLACKSBURG, VA	9% April 1981	26% May 1981 Direct/Immed.	22% June 1981	7% Febuary 1986	189%	144%	-22% (1)[2]
HUBBELL LIGHTING CHRISTIANSBURG, VIRGINIA	6% April 1981	16% May 1981 Direct/Immed.	15% June 1981	11% April 1986	166%	150%	83% (2)[2]
RADFORD ARMY AMMUNITION PLANT (REAR GATE) RADFORD, VA	19% April 1981	43% May 1981 Direct/Immed.	35% June 1981	26% April 1986	126%	84%	37% (2)[2]

[1] 1 = Percent Increase from Baseline to Intervention Period
2 = Percent Increase from Baseline to Withdrawal Period
3 = Percent Increase from Baseline to longest-term Follow-up Period

[2] Number in parentheses denotes number of additional safety belt programs conducted between withdrawal and follow-up.

Table 2 (continued)

Employee Safety Belt Use:
Summary of Short and Long Term Program Intervention Effects
at Ten Sites

EMPLOYER	INITIAL BASELINE BELT USE	INTERVENTION BELT USE	WITHDRAWAL BELT USE	FOLLOW UP BELT USE	NET GAINS[1] 1	2	3
RADFORD ARMY AMMUNITION PLANT (MAIN GATE) RADFORD, VA	7% October 1981	23% December 1981 Direct/Delay	16% January 1982	22% April 1986	229%	129%	214% (1)[2]
VIRGINIA TECH CAMPUS BLACKSBURG, VA	24% April 1979	42% April 1979 Indirect/Delay	26% June 1980	49% April 1986	77%	8%	104% (7)[2]
BURROUGHS WELLCOME, CO. GREENVILLE, NC	11% October 1983	20% February 1984 No Reward	44% March 1984	38% September 1985	82%	300%	245% (1)[2]
REEVES BROS. CURON PLANT CORNELIUS, NC	20% January 1984	45% June 1984 No Reward	62% January 1985	50% May 1985	125%	210%	150% (2)[2]
REEVES BROS. CAROLINA PLANT CORNELIUS, NC	5% February 1984	39% February 1984 No Reward	32% April 1984	12% February 1985	680%	540%	140% (2)[2]

[1] 1 = Percent Increase from Baseline to Intervention Period
2 = Percent Increase from Baseline to Withdrawal Period
3 = Percent Increase from Baseline to longest-term Follow-up Period

[2] Number in parentheses denotes number of additional safety belt programs conducted between withdrawal and follow-up.

safety belt use from baseline to the longest-term follow-up was divided by the mean safety belt use observed during the initial baseline period for a particular location [e.g., (11% - 10%)/10% = 10%]. The number in parentheses for some locations denotes the number of interventions implemented subsequent to the intervention identified in Table 2. At some locations, long-term follow-up was assessed after implementation of more than one safety belt program. Therefore, these net gains may be higher than the net gains obtained at locations where subsequent programs were not implemented.

Table 3 combines the safety belt program results according to the type of intervention strategy employed: policy, direct and immediate rewards, direct and delayed rewards, indirect and delayed rewards, and no rewards. Baseline data were not collected immediately preceding the policy change at Virginia Tech and Radford Army Ammunition Plant. In order to obtain a general indication of the policy impact, the percent of safety belt use obtained for follow-up data collection periods of prior incentive/reward programs at these sites were used as baseline rates for the subsequent policy programs. A mean initial impact of 66% was indicated at the two sites from baseline to the policy change. After all the policy memos were distributed (approximately one week at both locations), the increase in safety belt use averaged 77% across the two programs. No long-term follow-up data collection took place for these policy change programs.

At six locations, observations were taken to evaluate the effect of seven direct and immediate reward programs. Six programs had pre-program measures of baseline safety belt use. During the intervention period, safety belt use increased an average of 137% from initial baseline levels. Five programs collected safety belt use data during withdrawal. At these locations, safety belt use remained 88% above initial baseline levels during the withdrawal period. Four programs assessed safety belt use during a follow-up period (one month to two years after withdrawal; M = 7.0 months). For these programs, safety belt use still averaged 62% above initial baseline levels.

Six corporate locations conducted direct and delayed reward programs to increase the use of safety belts. Baseline data were collected at five of these locations prior to the program. Safety belt use during intervention periods increased an average of 101% from baseline levels. After program withdrawal, safety belt use remained an average of 52% above baseline. Follow-up data was collected three months to two and a half years after withdrawal of the programs at these five sites (M = 12.8 months). Despite the absence of any safety belt program for many months at these locations, safety belt use continued to average 15% above initial baseline levels. Note that these follow-up measures were taken

Table 3

Average Percent Change in Safety Belt Use as a Function of Program Type

Percent Change (Net Gain)
(n = # of observed drivers)

TYPE OF PROGRAM	BASELINE TO FIRST INTERVENTION	BASELINE TO WITHDRAWAL	BASELINE TO FOLLOW-UP
Direct and Immediate 6 Locations (n = 67,939) 7 Interventions	**137%** 6 Locations (n = 63,979) 6 Interventions	**88%** 5 Locations (n = 55,924) 5 Interventions	**62%** 4 Locations (n = 52,837) 4 Interventions
Direct and Delayed 6 Locations (n = 127,420) 6 Interventions	**101%** 5 Locations (n = 109,860) 5 Interventions	**52%** 5 Locations (n = 109,860) 5 Interventions	**15%** 5 Locations (n = 109,860) 5 Interventions
Indirect and Delayed 1 Location (n = 4,642) 2 Interventions	**46%** 1 Location (n = 4,642) 2 Interventions	**12%** 1 Location (n = 3,175) 1 Intervention	**-4%** 1 Location (n = 3,175) 1 Intervention
No Reward 5 Locations (n = 30,136) 6 Interventions	**187%** 5 Locations (n = 30,136) 6 Interventions	**285%** 3 Locations (n = 15,970) 4 Interventions	**152%** 2 Locations (n = 5,565) 2 Interventions
Policy 2 Locations (n = 14,406) 2 Interventions	**66%** 2 Locations (n = 14,406) 2 Interventions	**77%** 2 Locations (n = 14,406) 2 Interventions	—— NA

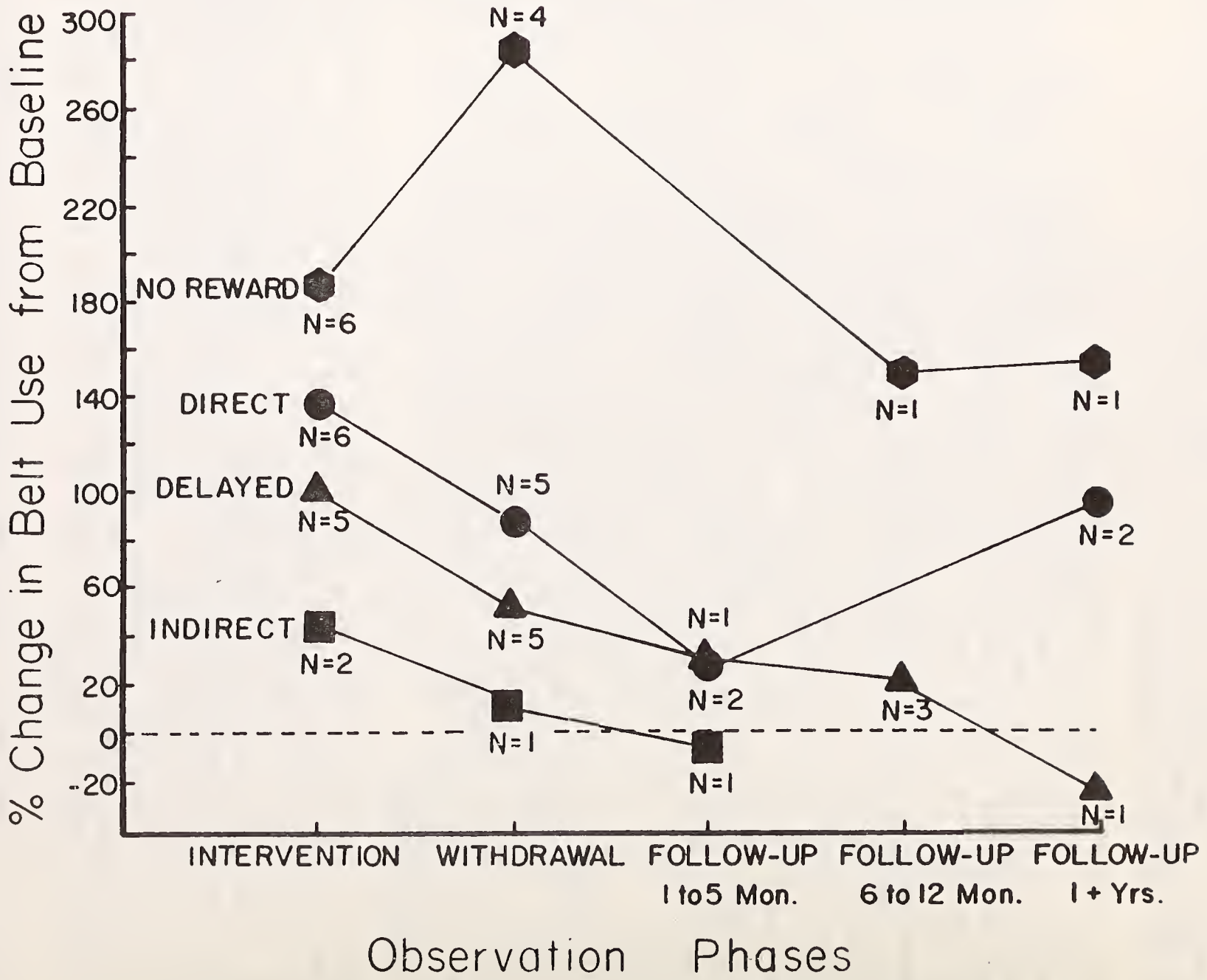
later than those for the direct and immediate programs (i.e., means of 7.0 vs. 12.8 month delays between program withdrawal and follow-up for immediate and delayed reward programs, respectively). Therefore, the lower long-term impact for direct and delayed programs (i.e., 15% vs. 62% gains) could be partially due to the delayed assessment.

Two programs using an indirect and delayed reward strategy to motivate safety belt use were implemented at Virginia Tech. In general, these two programs were not as effective in motivating safety belt use as the previously reviewed programs. Safety belt use increased an average of 46% above baseline. During withdrawal of the Spring 1985 Pledge Card Sweepstakes, safety belt use fell to 12% above the initial baseline. Follow-up data, collected three months after program withdrawal, indicate that safety belt use actually fell 4% below the initial baseline level (i.e, from 34.5% to 36.0%). It should be noted, however, that when the Spring 1985 Pledge Card program was implemented, Virginia Tech faculty/staff (and students) had already been the target of six previous safety belt programs. The high Spring 1985 baseline level of belt use (i.e. 36%) was probably a function of the cumulative residual effects of these six programs. Consequently, the comparatively low effectiveness of this program may be attributed to the high initial baseline. Indeed, had the original level of safety belt use at Virginia Tech (i.e., 24% during the Spring of 1979) been used to compute the effects of the Spring 1985 program, the percent increase would have been 74% above baseline. During withdrawal, safety belt use would have been 68% over the baseline level. Safety belt use during long-term follow-up would have remained 44% above the initial baseline level. Also note that the Virginia Tech programs, targeting a total of 6,727 employees, were much larger scale than the corporate-based programs. Effective program promotion was particularly challenging for the large university campus.

Five corporate locations implemented no reward (i.e., awareness and/or commitment) programs to motivate safety belt use. During the course of these interventions, safety belt use rose an average of 187% above initial baseline levels. When data were collected at three of these locations after the commitment period expired, belt use had actually increased to 285% above initial baseline. Most of the commitment programs designated one month as the length of the safety belt pledge. Two safety belt programs with no extrinsic rewards collected follow-up belt use data 7 and 13 months after termination of the pledge period. At these two locations, safety belt use remained an average of 152% above the initial baseline levels.

Figure 4 graphically summarizes the percent gain in safety belt use as a function of the time interval between intervention and collection of subsequent data. Baseline to intervention effects

FIGURE 4. PERCENT CHANGE IN SHOULDER BELT USE FROM BASELINE AS A FUNCTION OF PROGRAM TYPE AND OBSERVATION PHASE.



are graphed at zero since no time had elapsed since the end of the program. Baseline to withdrawal effects are graphed at approximately one month, since most programs ended after approximately one month. Because follow-up data were collected as early as one month after the intervention terminated and as late as two and a half years after intervention withdrawal, broad ranges of post-intervention impact are illustrated. Specific categories for follow-up data include: one to five months after intervention, six to 12 months after intervention, and over one year after intervention.

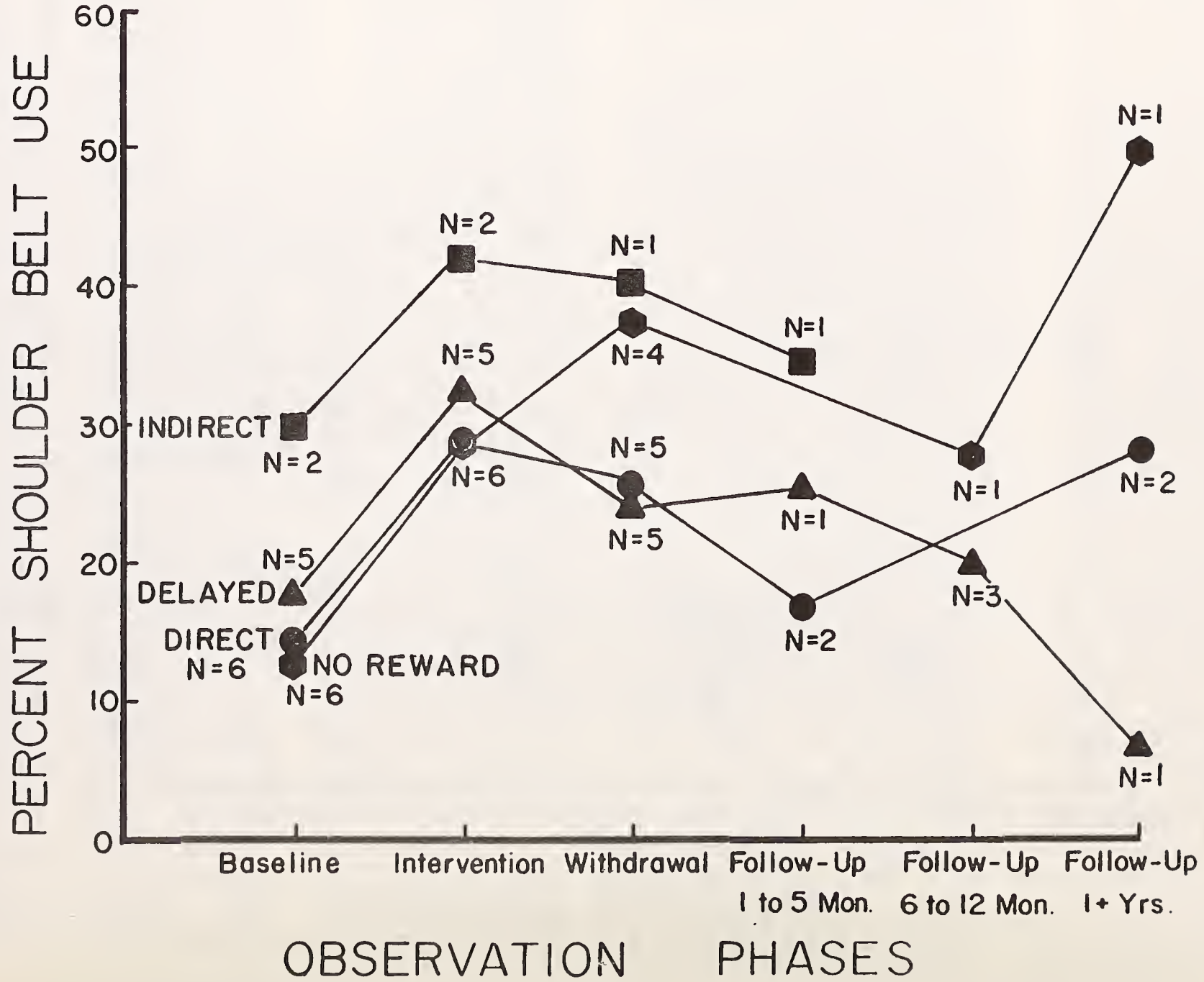
Although Figure 4 indicates greater impact of the No Reward approach, especially over the long term, it is important to realize that these percent gain data are determined by baseline safety belt use. For example, the same absolute increase in safety belt use for two types of programs would not be represented similarly in Figure 4 if the levels of baseline belt use were markedly different. The extent of such bias for the current comparisons can be estimated by examining Figure 5, which compares the absolute mean levels of shoulder belt use for the four program types across the various experimental conditions, including Baseline (i.e., before the intervention), Intervention (i.e., during the safety belt program), Withdrawal (i.e., immediately after the intervention), and three Follow-Up phases (i.e., 1 to 5 months after the program ended, 6 to 12 months after program termination, and a year or more following the program).

Figure 5 indicates that there were prominent differences in the baseline levels which moderated the gain information displayed in Figure 4. Most evident is the unusually high baseline for the two indirect programs. These safey belt programs were conducted on the university campus of Virginia Tech and occurred nine months after a year-long delayed reward program at the university. Thus, the high baseline was partially due to the impact of a previous delayed reward program, and in fact, this baseline data (for the indirect programs) was used in the calculations of the 6 to 12 month Follow-Up gain for the delayed reward programs.

Figure 5 shows approximately equivalent immediate increases in safety belt use (i.e., about 15 percentage points from Baseline to Intervention) for the three program types with similar baselines (i.e., Delayed, Direct, and No Reward). Although the Indirect programs started at higher baseline levels, the inital absolute gain in belt use for these programs was not substantially less than it was for the other programs (i.e., a mean increase of approximately 12 percentage points from Baseline to Intervention).

After program termination, Figure 5 indicates greater maintenance for the No Reward programs at every observation phase. Even though the mean baseline level of shoulder belt use was lowest for the six No Reward programs, belt use for only these programs in-

FIGURE 5. PERCENT OF EMPLOYEES USING A SHOULDER BELT AS A FUNCTION OF PROGRAM TYPE AND OBSERVATION PHASE.



creased during Withdrawal and the one No Reward program with Follow-Up data showed record-high maintenance levels. This is consistent with the relationships illustrated in Figure 4. Although the shoulder belt use percentages dropped immediately after each of the incentive programs were terminated (i.e., for Direct, Delayed, and Indirect rewards), belt use almost always remained above Baseline. In fact, for only one evaluation (i.e., for a direct reward program) were follow-up observations below baseline, and this occurred with an excessive five-year interval between the Baseline and Follow-Up phases.

Table 4 presents the overall average percent change in safety belt use for blue-collar workers as a function of eight interventions at three locations and for white-collar workers as a function of five interventions at three locations. A total of 49,008 vehicle observations were made of blue-collar workers and 29,245 vehicle observations of white-collar workers during the evaluation of these programs. In general, the safety belt programs appear to influence blue-collar workers more than white-collar workers, but this is largely due to lower baseline levels for blue-collar than white-collar workers (i.e., 4.7% vs. 18.7%). During the interventions, safety belt use by blue-collar workers increased an average of 227% over their low baseline levels, whereas white-collar workers showed an average 85% increase in safety belt use. Blue-collar workers also maintained a higher level of sustained safety belt use during the withdrawal phases than did white-collar workers. However, the absolute level of blue-collar safety belt use during withdrawal was lower than the white-collar use. 13.9% vs. 27.3% safety belt use for blue vs. white-collar workers, respectively).

During withdrawal, safety belt use by blue-collar workers averaged 247% above initial baseline levels compared to 70% for white-collar workers. Follow-up measures of safety belt use by blue-collar workers averaged 15% above their initial baseline level, whereas safety belt use among white-collar workers actually fell 24% below their initial baseline level. Again, it is important to realize that the marked difference in maintenance efforts is primarily due to the lower baseline level for the blue-collar workers. The mean follow-up safety belt use was actually 10.0% for blue-collar workers and 11.8% for white-collar employees.

Table 4

Overall Average Percent Change in Safety Belt Use for Blue and White Collar Workers

Percent Change (Net Gain)

TYPE OF WORKER	BASELINE TO FIRST INTERVENTION	BASELINE TO WITHDRAWAL	BASELINE TO FOLLOW-UP
Blue Collar	**227%**	**247%**	**15%**
3 Locations	3 Locations	2 Locations	1 Location
(n = 49,008)	(n = 37,374)	(n = 26,814)	(n = 11,668)
8 Interventions	6 Interventions	3 Interventions	1 Intervention
White Collar	**85%**	**70%**	**-24%**
3 Locations	3 Locations	2 Locations	2 Locations
(n = 29,245)	(n = 29,245)	(n = 26,965)	(n = 26,965)
5 Interventions	5 Interventions	4 Interventions	4 Interventions

Discussion

It is certainly encouraging and reinforcing that every one of the 28 different safety belt programs reviewed in this report increased employees' safety belt use, and most of these practical interventions sustained substantial beneficial impact long after program termination. This conclusion is consistent with the findings of other investigators who attempted to motivate safety belt use with the incentive/reward techniques described in this review (e.g., Campbell, Hunter, Stewart, & Stutts, 1982; Campbell, Hunter, & Gemming, 1983; Elman & Killebrew, 1978; Horne & Terry, 1983; Spoonhour, 1981). However, the remarkable impact of the "no reward" programs is not consistent with other awareness or educational approaches to increase safety belt use at the community level (Cunliffe et al., 1975; Robertson et al., 1974) or corporate level (Geller, 1982a; Phillips, 1980).

It is noteworthy that the successful educational approaches in this study incorporated more active involvement of participants than other unsuccessful interventions. Rather than merely displaying billboard or poster slogans, or lecturing to passive audiences, our educational awareness approach focused on interactive discussions among participants. In fact, we tried to follow the Confucian principle that telling will result in forgetting, demonstrating will increase remembering, and involvement will influence understanding.

Most other interventions cited in this report were implemented during relatively short periods of time (i.e., from a few weeks to a month), and post-program evaluations were typically conducted immediately after termination of the intervention and lasted only a few weeks. Thus, employer safety belt programs have usually lacked adequate long-term follow-up evaluations. Therefore, a prime goal of the current research was to obtain additional long-term follow-up data on employee safety belt use. One exception to the short-term programs was the intermittent incentive programs implemented at Virginia Tech each academic quarter for two years.

During each quarter of the 1983-1984 academic year at Virginia Tech (6,727 employees and 21,357 students), the 22 campus police officers recorded license plate numbers of drivers using a safety belt. Ten raffle winners were drawn from these license numbers on three consecutive Mondays during the Fall, Winter, and Spring Quarters. Faculty and staff increased their safety belt use significantly during each intervention phase, but when the incentive programs were withdrawn safety belt use declined. However, safety belt use during each post-intervention period (i.e., the withdrawal phase) was higher than the immediately preceding pre-intervention (baseline) phase. Consequently, the periodic

implementation of the campus "Seatbelt Sweepstakes" resulted in successively increasing post-intervention effects. More specifically, the baseline safety belt use of faculty and staff in the Fall of 1983 was 19.3%, compared to 31.7% in the Spring of 1984, after three-week "Seatbelt Sweepstakes" had been implemented and terminated each quarter. See Rudd and Geller (1985) for more details on the procedures and results of this campus-based safety belt program.

Successively increasing residual effects of consecutive short-term intermittent safety belt programs were also observed at General Motors Tech Center during three "pledge card sweepstakes" (Horne & Terry, 1983), and in Canada where periodic introductions of a "selective traffic enforcement program" (STEP) provided widespread publicity and an obtrusive enforcement blitz for the Canadian mandatory belt use law (Jonah, Dawson, & Smith, 1982).

The second large-scale, safety belt campaign at Virginia Tech did not provide direct rewards for safety belt use (as the prior "direct and delayed" program). Rather, this campaign was an "indirect and delayed" program offering raffle prizes for employees (and students) who signed a "buckle up" pledge card commitment to use their safety belt for the remainder of the academic year (1984-85). The intermittent introduction of this three-week "pledge card sweepstakes" (i.e., an .us indirect and delayed reward strategy) resulted in significant residual effects after program withdrawal, even though baseline safety belt use was unusually high, presumably due to the previous "direct and delayed" program. That is, the baseline of 36% used to evaluate the campus pledge card program was almost double the baseline of 19.3% used to evaluate the 1983 direct "Seatbelt Sweepstakes". At any rate, three months after the second "Pledge Card Sweepstakes" (i.e., Winter 1986), safety belt use among university employees averaged 49.2%, a level 155% higher than the initial baseline of 19.3% taken in the Fall of 1983.

The most discouraging finding of this review is the drastic decline in employee safety belt use long after program withdrawal. Although safety belt use remained substantially above initial baseline levels immediately after the incentive/reward programs were withdrawn, follow-up data five or more months later often showed employee safety belt use declining to near the baseline use levels which were usually quite low (i.e., 5% or below for blue-collar workers and 19% for white-collar workers). Such declines occurred in spite of the increased media attention devoted to safety belt use throughout this period. Thus, although single incentive/reward programs for safety belt promotion produce marked increases in employee safety belt use, intermittent introduction of such programs (perhaps with varying reward contingencies) are necessary for substantial long-term maintenance of safety belt use (cf. Geller, 1983, 1985). Indeed, repeated incentive/reward pro-

grams were responsible for the prevention of numerous fatalities and injuries at Du Pont (Spoonhour, 1981, 1982) and Ford Motor Company (Gray, 1986; Gray et al., 1985).

The net gains in the various programs were based on benchmarks established during pre-program baseline periods when societal attention to safety belt use was increasing (e.g., through media focus on a concerted nationwide effort to promote the use of safety belts and child safety seats). Consequently, some of the increased safety belt use may have been partially due to factors independent of a specific employer safety belt campaign. Differential baseline levels (i.e., excessively low for blue-collar workers) are also responsible for the apparent conclusion that blue-collar workers showed greater net gain in safety belt use than white-collar workers. This conclusion contradicts the findings reported by others (Campbell et al., 1982; Geller, 1982; Geller & Hahn, 1984; Geller, Davis, & Spicer, 1983).

An unexpected and provocative finding of this review, suggesting a critical need for further research, is the greater impact of the "no reward" strategies from both an immediate and long-term perspective. The hierarchy of different intervention effects from the various incentive/reward programs is exactly as expected from applied behavior analysis and social learning theory (e.g., Bandura, 1969; Skinner, 1938, 1953). That is, the direct-immediate reward effects were greater than the indirect-delayed reward effects. On the other hand, the superior effects (both short and long-term) of the no reward, awareness/commitment programs were not predicted and are inconsistent with basic reinforcement theory.

A recent program implemented for 778 employees at Johnson and Johnson in New Brunswick, NJ (Weinstein, Grubb, & Vautier, 1986) found results analogous to the outcome of the "no reward" programs reviewed in this document. The program consisted essentially of distributing "buckle-up" stickers for car dashboards, posting permanent "buckle-up" signs at the parking deck, and placing small buckle-up reminder placards on cafeteria tables. The only rewards were inexpensive and "indirect" (i.e., those using the dashboard stickers received a keychain or a frisbee). The outcome of this corporate intervention was not as prominent as those reviewed in this document, but did parallel the "no reward" function of Figure 3. Specifically, during the intervention period, safety belt use increased approximately 21% (from a 30.7% baseline to 37.3% during intervention). When follow-up data was collected six months later, employee safety belt use increased to 45.2% (a 47.2% increase above baseline). The authors do not indicate whether the New Jersey safety belt use law went into effect during their study and thus biased their results. It is interesting that the marked follow-up effect of this program was comparable to the "no reward" programs of the current review.

A variety of theoretical formulations and empirical investigations suggest that extrinsic incentives/rewards may not be the optimal approach for motivating lasting behavior change. The "minimal justification principle" (Lepper, 1981), for example, proposes the use of less powerful extrinsic techniques of social control, especially when long-term impact is desired. Thus, from this perspective an extrinsic motivator may prevent an individual from gaining internal justification for performing the target behavior (e.g., safety belt use). Furthermore, the desired behavior may decrease in frequency when the external controls are withdrawn. This proposition has received considerable empirical support from experimental tests of overjustification (e.g., Lepper, Greene, & Nisbett, 1973), intrinsic motivation (Deci, 1975; Deci & Ryan, 1980), and cognitive dissonance and attribution theory (e.g., Aronson, 1966; Aronson & Carlsmith, 1963; Wilson & Lassiter, 1982).

The particular "no reward" strategies reviewed in this document modeled the classic applied research of Kurt Lewin (cf. 1958). Lewin showed that individuals can be influenced to change their behavior through interactive verbal discussion (rather than directive lectures) that solicits individual commitment to emit the target behavior. The commitment component in the safety belt program included distributing and signing "buckle-up" pledge cards following small-group discussions of the benefits of safety belt use. It is noteworthy that these successful "no reward" programs were conducted with small work groups (i.e., from 10 to 30 employees) and such a technique may not be feasible for large corporations or institutions (e.g., Cope et al., in press; Geller & Bigelow, 1984; Kello & Geller, 1986). Furthermore, the number of "no reward" programs for safety belt promotion have been few, and only one of these programs evaluated long-term impact.

At this point, it would be premature to conclude that one type of strategy for motivating safety belt use is more effective than another. Theory does not provide straightforward answers, and practical consideration may restrict alternative programs. The group awareness/commitment approach, for example, requires opportunities to meet employees in relatively small groups for interactive discussions. The size or work schedules of many companies may make this strategy infeasible. If such awareness sessions are possible, the distribution of "buckle-up" pledge cards is advisable. However, we currently do not know if employees should be offered an extrinsic incentive for making a buckle-up commitment, nor do we know whether such commitments should be public or private. Although reinforcement theory predicts more pledge card signing if the pledge cards become raffle tickets for prize lotteries, attribution theory (Bem, 1967) and the minimal justification principle (Lepper, 1981) lead one to expect greater intrinsic motivation and more long-term compliance when extrinsic rewards are not associated with commitment. Further, peer pressure would

facilitate a buckle-up commitment that was made publicly, but this advantage might be weakened by the fewer number of individuals who would make a public rather than private commitment to buckle up.

Conclusions

Substantial progress in the promotion of voluntary safety belt use has already been made as noted by the exemplary efficacy of the behavior change programs reviewed in this report. There remains a need for more comprehensive ongoing or recurring programs rather than short one-time efforts. A primary factor in maintaining an ongoing successful program is securing the support and "ownership" of indigenous persons and top level management. Although several safety belt programs (at Virginia Tech) have gained the support of administrators and some active involvement by campus police officers during the intervention phases, institutionalization of an incentive approach did not occur. However, the programs did have a lasting influence in that the administration established a policy requiring all university personnel to buckle up on-the-job. Additionally, the campus motor pool has actively promoted the belt use policy by providing a "buckle-up" reminder message when vehicles are signed out and displaying "safety belt use requirement" stickers in all university vehicles.

Another issue that needs to be addressed is whether programs promoting voluntary safety belt use are needed in states that have adopted mandatory safety belt use laws (MULs). Can incentive programs significantly increase safety belt use beyond the 40-50% level achieved in some MUL states? It is possible (even likely) that certain individuals who resist compliance to a mandate (e.g., a MUL) will emit the desired behavior "voluntarily" in order to receive reward opportunities. Further, the enforcement of a state MUL could be made more palatable to police and the public if a police-administered incentive program for those using a safety belt were combined with monetary fines (i.e., disincentives) for nonuse of safety belts.

Obviously, there are numerous important research questions left to be answered in the life-saving domain of developing cost-effective programs for motivating consistent safety belt use. If we are going to make larger "dents" in the Number One killer of youth aged 4 to 34 (i.e., the vehicle crash), further research is needed to address the following issues.

- How should short-term incentive and reward programs be intermittently scheduled for maximum long-term impact?

- What is the optimum combination of extrinsic incentives and intrinsic commitment strategies to increase the greatest number of safety belt users over the longest period of time?

- What are the independent additive effects on safety belt use of awareness discussions, commitment pledges, buckle-up incentives, and mandatory use policy?

- What are the comparative costs and benefits of an incentive program to reward safety belt use versus a disincentive program to punish non-use of safety belts?

- How can the cost-effective employer programs for increasing workers' safety belt use be adopted to target children in schools, day care centers, and various other community locations?

These important research issues were prompted by the present review of various approaches toward increasing the "voluntary" use of vehicle safety belts. Readers will likely add several others to this list. Clearly, these are some of the most important public health questions in the prevention area. The tragedy is that funds for prevention research are relatively minuscule, and within the prevention domain, the promotion of vehicle safety belt use has not received the urgent priority it deserves.

References

Aronson, E. (1966). The psychology of insufficient justification: An analysis of some conflicting data. In S. Feldman (Ed.), Cognitive consistency. New York: Academic Press.

Aronson, E., & Carlsmith, J. E. (1963). Effect of the severity of threat on the devaluation of forbidden behavior. Journal of Abnormal and Social Psychology, 66, 584-588.

Bandura, A. (1969). Principles of behavior modification. New York: Holt, Rinehart & Winston.

Bem, D. J. (1967). Self-perception: An alternative interpretation of cognitive dissonance phenomena. Psychological Review, 74, 183-200.

Bigelow, B. E. (1982). The NHTSA program of safety belt research. SAE Technical Paper Series, No. 820797. Warrendale, PA: Society of Automotive Engineers.

Campbell, B. J., Hunter, W. W., & Gemming, M. (1983, July). Seat belts pay off: A communitywide research/public service project designed to increase use of lap and shoulder belts. Interim Report, University of North Carolina, Highway Safety Research Center, Chapel Hill, NC.

Campbell, B. J., Hunter, W. W., Stewart, J. R., & Stutts, J. C. (1982, October). Increasing safety belt use through an incentive program. Final report for Innovative Grant Project 4-A22 from the U.S. Department of Transportation, University of North Carolina, Highway Safety Research Center, Chapel Hill, NC.

Campbell, B. J., Marchetti, L. M., Gemming, M. G., & Hunter, W. W. (1984). Community seat belt incentive programs: A guidebook. Chapel Hill, NC: University of North Carolina Highway Safety Research Center.

Cope, J. G., Grossnickle, W. F., & Geller, E. S. (1986). An evaluation of three corporate strategies for safety belt use promotion. Accident Analysis and Prevention, 18, 243-251.

Cunliffe, A. P., DeAngelis, F., Foley, C. M., Lonero, L. P., Pierce, J. A., Siegel, C., Smutylo, T., & Stephan, K. M. (1975). The design and implementation of a seat-belt education program in Ontario. Paper presented at the Annual Conference of the Roads and Transportation Association of Canada, Calgary.

Deci, E. L. (1975). Intrinsic motivation. New York: Plenum.

Deci, E. L., & Ryan, R. M. (1980). The empirical exploration of intrinsic motivational processes. In L. Berkowitz (Ed.), Advances in experimental social psychology, Vol. 13, New York: Academic Press, pp. 39-60.

Elman, D., & Killebrew, T. J. (1978). Incentives and seat belts: Changing a resistant behavior through extrinsic motivation. Journal of Applied Social Psychology, 8, 72-83.

Federal Register. (1984, July). Federal motor vehicle safety standards: Occupant crash protection, final rule. Vol. 48, No. 138, Washington, DC: U.S. Department of Transportation.

Geller, E. S. (1982a). Development of industry-based strategies for motivating seat-belt usage: Phase II. Quarterly Report for DOT Contract DTRS 5681-C-0032. Blacksburg, VA: Virginia Polytechnic Institute and State University.

Geller, E. S. (1982b). Corporate incentives for promoting safety belt use: Rationale, guidelines, and examples. (Final Report for NHTSA Contract No. DTNH 22-82-0-05552). Blacksburg, VA: Virginia Polytechnic Institute and State University.

Geller, E. S. (1983). Rewarding safety belt usage at an industrial setting: Tests of treatment generality and response maintenance. Journal of Applied Behavior Analysis, 16, 43-56.

Geller, E. S. (1984). Motivating safety belt use with incentives: A critical review of the past and a look to the future. SAE Technical Paper Series, No. 840326. Warrendale, PA: Society of Automotive Engineers.

Geller, E. S. (1985). Corporate safety belt programs. Blacksburg, VA: Virginia Polytechnic Institute and State University.

Geller, E. S., & Bigelow, B. E. (1984, September-October). Development of corporate incentive programs for motivating safety belt use: A review. Traffic Safety Evaluation Research Review, Vol. 3, No. 5, 21-38.

Geller, E. S., Davis, L., & Spicer, K. (1983). Industry-based rewards to promote seat belt usage: Differential impact on white-collar versus blue-collar employees. Journal of Organizational Behavior Management, 5, 17-29.

Geller, E. S., & Hahn, H. A. (1984). Promoting safety belt use at industrial sites: An effective program for blue collar employees. Professional Psychology: Research and Practice, 15, 553-564.

Geller, E. S., Kalsher, M. J., Rudd, J. R., & Lehman, G. R. (1986, November). A university safety belt program: Using rewards to motivate a buckle-up commitment. Final Report for Contract DTNH-22-85-C-07301 from the National Highway Traffic Safety Administration, Washington, D.C.

Gray, D. A. (1986). Corporate Safety Director of Ford Motor Company. Personal Communication to E. Scott Geller, June 14, 1986.

Gray, D. A., Bohan, B., & Geller, E. S. (1985, June). How to implement an effective employee seat belt program. Workshop at the 24th Annual ASSE Professional Development Conference & Exposition, San Diego, CA.

Horne, T. D., & Terry, T. (1983). Seat belt sweepstakes - An incentive program. SAE Technical Paper Series, No. 834074. Warrendale, PA: Society of Automotive Engineers.

Jonah, B. A., Dawson, N. E., & Smith, G. A. (1982). Effects of a selective traffic enforcement program on seat belt use. Journal of Applied Psychology, 69, 84-96.

Kello, J. E., & Geller, E. S. (1986). Motivating auto safety belt wearing in industrial settings: From awareness sessions to behavior change. Manuscript in preparation. Davidson, NC: Davidson College.

Lepper, M. (1981). Intrinsic and extrinsic motivation in children: Detrimental effects of superfluous social controls. In W. Colins (Ed.) Aspects of the development of competence: The Minnesota symposium on child psychology, 14, 155-160.

Lepper, M., Greene, D., & Nesbett, R. (1973). Undermining children's intrinsic interest with extrinsic rewards: A test of the overjustification hypothesis. Journal of Personality and Social Psychology, 28, 129-137.

Lewin, K. (1958). Group decision and social change. In E. E. Maccoby, T. M. Newcomb, & E. L. Hartley (Eds.), Readings in social psychology (pp. 197-211). New York: Holt, Rinehart & Winston.

National Highway Traffic Safety Administration (1985). The profit in safety belts: A handbook for employees. (DOT Publication No. HS 806 493). Washington, DC: U.S. Department of Transportation.

Pabon, Sims, Smith, & Associates, Inc. (1983) Motivation of employers to encourage their employees to use safety belts: Phase

II. (Contract No. DTNH 22-80-C-07439). Washington, DC: National Highway Traffic Safety Administration.

Phillips, E. M. (1980, June). Safety belt education program for employees: An evaluation study. Opinion Research Corp. (Final Report for Contract DOT-HS-7-01707). Washington, DC: U.S. Department of Transportation.

Richardson, B., & Race, K. E. H. (1984, November). Development of non-traditional contingencies for highway safety: A focus on the workplace. National Safety Council, 444 North Michigan Avenue, Chicago, IL.

Robertson, L. S., Kelley, A. B., O'Neill, B., Wixom, C. W., Eiswirth, R. S., & Haddon, W. (1974). A controlled study of the effect of television messages on safety belt use. American Journal of Public Health, 64, 1071-1080.

Rudd, J. R., & Geller, E. S. (1985). A university-based incentive program to increase safety belt use: Toward cost-effective institutionalization. Journal of Applied Behavior Analysis, 18, 215-226.

Skinner, B. F. (1938). The behavior of organisms. New York: Appleton-Century Crofts.

Skinner, B. F. (1953). Science of human behavior. New York: Macmillan.

Spoonhour, K. A. (1981, September-October). Company snap-it-up campaign achieves 90 percent belt use. Traffic Safety, pp. 18-19, 31-32.

Spoonhour, K. A. (1982, January). Case study of a successful employee safety belt program. Paper presented at the 61st annual meeting of the Transportation Research Board, Washington, DC.

Weinstein, N. D., Grubb, P. D., & Vautier, J. S. (1986). Increasing automobile seat belt use: An intervention emphasizing risk susceptibility. Journal of Applied Psychology, 71, 2, 285-290.

Wilson, T., & Lassiter, G. (1982). Increasing intrinsic interest with superfluous extrinsic controls. Journal of Personality and Social Psychology, 42, 811-819.

Appendix A

Summary of Observed Driver Safety Belt Use at Corning Glass Works, Blacksburg, VA (220 Employees).

EXPERIMENTAL CONDITION	SCHEDULE	NUMBER OF OBSERVATIONS	PERCENT BUCKLED UP
Baseline	Apr. 1981 3 Weeks	2812	9.9%
Incentive Flyers (Direct & Immediate Reward)	**May 1981 4 Weeks**	**4440**	**25.4%**
Withdrawal	June 1981 2 Weeks	1628	20.1%
Follow-Up	July 1981 2 Weeks	1924	11.4%
Baseline	Sept. 1982 11 Days	1947	17.2%
Awareness & Pledge Card (No Reward)	**Sept. 1982 28 Days**	**4956**	**33.7%**

Note -- This plant closed in 1983.

Appendix B

Summary of Observed Driver Safety Belt Use at
Radford Community Hospital, Radford, VA (520 Employees)

EXPERIMENTAL CONDITION	SCHEDULE	PLEDGE CARD SIGNERS		PLEDGE CARD NON-SIGNERS		TOTAL	
		n	%	n	%	n	%
Baseline	March 1984 4 Weeks	1o1	29.4%	1378	11.8%	1539	15.6%
$5 for Usage and Pledge (Direct & Immediate Reward)	**April 1984 3 Weeks**	**3740**	**75.1%**	**7549**	**17.7%**	**11289**	**34.7%**
Withdrawal	May 1984 4 Weeks	220	56.0%	886	17.2%	1106	25.6%
Follow-Up 1	Oct. 1984 2 Weeks	231	44.9%	1032	22.1%	1263	28.6%
Follow-Up 2	April 1986 1 Week	———	———	———	———	542	28.4%

Appendix C

Summary of Observed Driver Safety Belt Use
Federal Mogul, Blacksburg, VA (525 Employees)

EXPERIMENTAL CONDITION	SCHEDULE	PERCENT OBSERVED SAFETY BELT USE					
		BLUE COLLAR		WHITE COLLAR		OVERALL	
		n	%	n	%	n	%
Baseline	April 1981 3 Weeks	2646	3.4%	1653	17.4%	4299	8.9%
Incentive Flyers (Direct & Immediate Reward)	**May 1981 2 Weeks**	**1590**	**4.3%**	**2166**	**41.3%**	**3756**	**25.6%**
Meal Coupons (Direct & Immediate Reward)	**May 1981 1 Week**	**270**	**9.3%**	____	____	**270**	**9.3%**
Withdrawal	June 1981 2 Weeks	954	6.2%	1254	33.1%	2208	21.5%
Follow-Up	July 1981 2 Weeks	____	____	1482	19.5%	1482	19.5%
Baseline	June 1983 5 Weeks	3872	6.3%	960	18.3%	4832	8.7%
License Plate Lottery (Direct & Delayed Reward)	**July 1983 4 Weeks**	**3509**	**13.4%**	**870**	**31.6%**	**4379**	**17.0%**
Withdrawal	Aug. 1983 2 Weeks	1210	7.9%	300	25.8%	1510	11.5%
Follow-Up 1	Aug. 1985 3 Days	1588	8.1%	223	28.7%	1811	10.7%
Follow-Up 2	Feb. 1986 3 Days	1489	7.2%	758	5.8%	2817	6.8%

Appendix D

Summary of Observed Driver Safey Belt Use
Hubbell Lighting, Christiansburg, VA (539 Employees)

EXPERIMENTAL CONDITION	SCHEDULE	PERCENT OBSERVED SAFETY BELT USE					
		BLUE COLLAR		WHITE COLLAR		OVERALL	
		n	%	n	%	n	%
Baseline	April 1981 3 Weeks	2183	2.7%	1380	11.7%	3563	6.2%
Incentive Flyers (Direct & Immediate Reward)	**May 1981 4 Weeks**	**3540**	**7.8%**	**3600**	**23.2%**	**7140**	**15.6%**
Withdrawal	June 1981 2 Weeks	1298	6.4%	1440	22.8%	2738	15.0%
Follow-Up	July 1981 2 Weeks	____	____	840	13.1%	840	13.1%
Baseline	June 1983	972	6.7%	2889	17.9%	3861	15.1%
Awareness Session (No Reward)	**June 1983 3 Weeks**	**3402**	**20.9%**	____	____	**3402**	**20.9%**
License Plate Lottery (Direct & Delayed Reward)	**July 1983 5 Weeks**	**4698**	**41.7%**	**3103**	**35.9%**	**7801**	**39.4%**
Withdrawal	Aug. 1983 3 Weeks	2430	26.8%	1605	27.4%	4035	27.0%
Follow-Up 1	Aug. 1985 3 Days	1793	6.1%	786	18.6%	2579	9.8%
Follow-Up 2	Apr. 1986 3 Days	1489	12.8%	1656	8.8%	3145	10.7%

Appendix E

Summary of Observed Driver Safety Belt Use
Radford Army Ammunition Plant, Radford, VA (1600 Employees)

EXPERIMENTAL CONDITION	SCHEDULE	PERCENT OBSERVED SAFETY BELT USE					
		REAR GATE		MAIN GATE		OVERALL	
		n	%	n	%	n	%
Baseline	April 1981 3 Weeks	2713	18.7%	———	———	———	———
Incentive Flyers (Direct & Immediate Reward)	**May 1981 4 Weeks**	**4650**	**43.4%**	———	———	———	———
Withdrawal	June 1981 2 Weeks	2015	35.1%	———	———	———	———
Follow-Up	July 1981 3 Weeks	2635	26.1%	———	———	———	———
Baseline	Oct. 1981 3 Weeks	1610	20.0%	9240	6.7%	10850	8.7%
License Plate Lottery (Direct & Delayed Reward)	**Dec. 1981 2 Weeks**	**840**	**25.2%**	**6600**	**23.1%**	**7440**	**23.3%**
Withdrawal	Jan. 1982 5 Weeks	2450	24.9%	16280	16.3%	18730	17.4%
Follow-Up 1	April 1982 5 Weeks	2590	26.2%	16720	15.8%	19310	13.7%
Follow-Up 2	Nov. 1982 2 Weeks	700	16.7%	4400	11.0%	5100	11.8%
Belt Use Policy	**Aug. 1985 1 Week**	**910**	**31.0%**	**4411**	**16.1%**	**5321**	**18.6%**
Withdrawal	April 1986 1 Week	2409	26.3%	6676	21.6%	9085	22.8%

Appendix F

Summary of Observed Driver Safety Belt Use Among Faculty and Staff of Virginia Tech, Blacksburg, VA (6,727 Employees)

EXPERIMENTAL CONDITION	SCHEDULE	% OBSERVED SAFETY BELT USE (FACULTY/STAFF) n	%
Baseline	April 1979 2 Weeks	1287 *	24.0% *
Rewards for Handbills (Indirect & Delayed Reward)	**April 1979 6 Weeks**	**180 ***	**42.2% ***
Baseline	June 1980 2 Weeks	693	26.3%
Symbols Game (Direct & Immedidate Reward)	**July 1980 3 Weeks**	**1259**	**45.7%**
Withdrawal	Aug. 1980 2 Weeks	629	37.9%
Baseline	June 1980 2 Weeks	693	22.2%
Symbols Game (Indirect & Immedidate Reward)	**July 1980 3 Weeks**	**1404**	**24.1%**
Withdrawal	Aug. 1980 2 Weeks	702	21.8%

* -- These numbers include individuals other than faculty and staff.

Appendix F (Con't.)

EXPERIMENTAL CONDITION	SCHEDULE	% SAFETY BELT USE FACULTY/STAFF n	%
Baseline	Sept. 1983 5 Weeks	3284	19.3%
License Plate Lottery (Direct & Delayed Reward)	**Oct. 1983 3 Weeks**	**2195**	**33.2%**
Withdrawal	Nov. 1983 3 Weeks	2403	27.9%
Baseline	Jan. 1984 3 Weeks	2796	25.3%
License Plate Lottery (Direct & Delayed Reward)	**Feb. 1984 3 Weeks**	**1872**	**31.7%**
Withdrawal	Mar. 1984 4 Weeks	963	29.9%
License Plate Lottery (Direct & Delayed Reward)	**May 1984 3 Weeks**	**2815**	**33.5%**
Withdrawal	June 1984 2 Weeks	1230	31.7%

Appendix F (Con't.)

EXPERIMENTAL CONDITION	SCHEDULE	% SAFETY BELT USE FACULTY/STAFF n	%
Baseline	April 1985 3 Weeks	1549	36.0%
Pledge Card Lottery (Indirect & Delayed Reward)	**May 1985 1 Week**	**1148**	**41.7%**
Withdrawal	June 1985 3 Weeks	263	40.3%
Follow-Up	Aug. 1985 3 Days	215	34.5%
Baseline	Oct. 1985 3 Weeks	667	46.2%
Pledge Card Lottery (Indirect & Delayed Reward)	**Nov. 1985 4 Weeks**	**1453**	**46.0%**
Withdrawal	Dec. 1985 2 Weeks	282	47.2%
Follow-Up	Feb. 1986 April 1986 2 Weeks	457	49.2%

Appendix G

Summary of Observed Driver Safety Belt Use at Burroughs Wellcome, Co, Greenville, NC (1400 Employees)

EXPERIMENTAL CONDITION	SCHEDULE	PERCENT SAFETY BELT USE	
		OVERALL n	%
Baseline	Oct. 1983 6 Weeks	896	11.1%
Awareness & Pledge Cards (No Reward)	**Feb. 1984 4 Weeks**	**458**	**19.9%**
Withdrawal	Mar. 1984 7 Weeks	822	43.9%
Follow-Up	Sept 1984 3 Weeks	422	27.7%
Baseline	Oct. 1984 4 Weeks	4911	32.5%
License Plate Lottery (Direct & Delayed Reward)	**Nov. 1984 10 Weeks**	**10965**	**53.9%**
Withdrawal	Jan. 1985 6 Weeks	4227	37.0%
Follow-Up	Sept 1985 2 Weeks	2300	38.0%

Appendix H

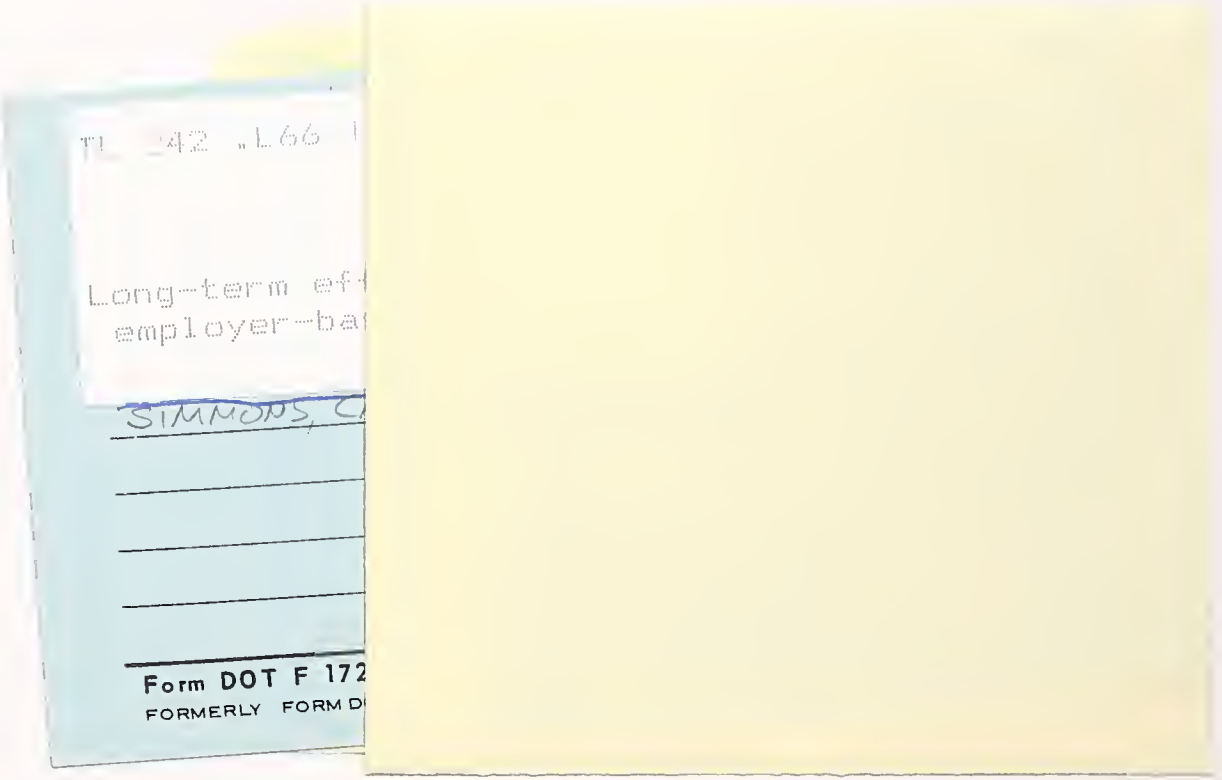
Summary of Observed Driver Safety Belt Use at
Reeves Bros. Curon Plant, Cornelius, NC (141 Employees)

EXPERIMENTAL CONDITION	SCHEDULE	PLEDGE CARD SIGNERS		PLEDGE CARD NON-SIGNERS		TOTAL	
		n	%	n	%	n	%
Baseline	Jan. 1984 2 Weeks	307	19.7%	165	19.4%	472	19.6%
Awareness & Pledge Cards (No Reward)	**June 1984 1 Week**	**200**	**43.0%**	**113**	**47.5%**	**313**	**44.6%**
Withdrawal	Jan. 1985 2 Weeks	789	61.7%	447	62.9%	1236	62.1%
Follow-Up	July 1985 2 Weeks	607	48.3%	339	52.9%	946	49.9%

Appendix I

Summary of Observed Driver Safety Belt Use at
Reeves Bros. Carolina Plant, Cornelius, NC (160 Employees)

EXPERIMENTAL CONDITION	SCHEDULE	BLUE COLLAR WORKERS n	BLUE COLLAR WORKERS %	WHITE COLLAR WORKERS n	WHITE COLLAR WORKERS %	TOTAL n	TOTAL %
Baseline	Feb. 1984 2 Weeks	1250	4.7%	____	____	1250	4.7%
Awareness & Pledge Card (No Reward)	**Feb. 1984 8 Weeks**	**5000**	**39.3%**	____	____	**5000**	**39.3%**
Withdrawal	Apr. 1984 3 Weeks	1875	32.0%	____	____	1875	32.0%
Baseline	Dec. 1984 4 Days	400	4.1%	80	28.0%	480	8.1%
Flash Card Prompt (One side only) (No Reward)	**Jan. 1985 1 Week**	**1000**	**7.6%**	**200**	**33.0%**	**1200**	**11.8%**
Flash Card Prompting (Both sides) (No Reward)	**Feb. 1985 2 Weeks**	**607**	**48.3%**	**339**	**52.9%**	**946**	**49.9%**
Withdrawal	Feb. 1985 1 Week	500	3.8%	100	52.0%	600	11.8%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