

CHAPTER 1

Introduction

Safety-belt use is considered to be among the most effective means of reducing motor vehicle crash related morbidity and mortality. Estimates of the protective effect of proper belt use on mortality reduction range from 22 to 75% (Derrig, Sugui-Gomez, Abtahi, & Liu, 2002). Over time, prevalence of driver safety-belt use in the United States has increased dramatically from 11% in 1980 to 80% in 2004 (NHTSA, 2004; Derrig, Sugui-Gomez, Abtahi, & Liu, 2002). However, belt use remains lower in the United States than in most developed countries and there currently remain large numbers of non-users and part-time users. The Federal initiative, “Healthy People 2010” challenges researchers, practitioners, and other community members to reduce morbidity and mortality due to unintentional injury. As part of this goal, “Healthy People 2010” seeks to increase safety-belt use to 92% by the year 2010 (HP2010, 2004).

Each year, the conversion of non-users and part-time users to full-time safety-belt users prevents morbidity and mortality. For example, the percentage of full-time users increased from 75% to 79% between years 2002 and 2003. It is estimated this increase prevented 1000 fatalities that would have otherwise occurred in 2003 and, overall, belt use prevented 15,000 fatalities in 2003 (NHTSA, 2003). NHTSA (2003) predicted that, if belt use is maintained at 79% and higher, over 15,000 deaths could be prevented each future year.

Motor vehicle related injuries and fatalities carry an enormous economic burden. In a report on the economic impact of motor vehicle crashes (U.S.D.O.T, 2002), non-use of safety belts in the year 2000 was linked to a cost of \$26 billion in direct and indirect costs as a result of 9,200 preventable fatalities and 143,000 serious injuries. Motor vehicle related morbidity and

mortality, often preventable by proper safety-belt use, leads to both economic and psychological consequences.

The psychological consequences of one motor vehicle crash death were felt by friends and family of Ashley Ryan Krueger, a Virginia Tech (VT) student. Ashley Ryan Krueger is now a statistic. Ashley's death is included in the 42,643 reported motor vehicle deaths in the U.S. during 2003 (NHTSA, 2004). It was determined by officers involved in the crash investigation that Ashley's death may well have been prevented had she been using her safety belt. In fact, The National Highway Traffic Safety Administration (NHTSA) reported that 56% of the deaths occurring in 2003 were preventable by proper use of safety belts. In other words, if Ashley had been using her safety belt, it is likely she would not have been included in the reported fatalities of 2003. Indeed, the occupants who were buckled up in the crash were not injured.

In memory of Ashley, her friends came to the Center for Applied Behavior Systems (CABS) at VT to request Dr. E. Scott Geller's assistance in their efforts to promote safety-belt use on the VT campus. Dr. Geller, a renowned researcher of ways to increase safety-belt use encouraged Ashley's friends to target safety-belt use campus-wide. At this point, the author became involved in study design, implementation, and evaluation of this unique community-driven intervention study-- referred to as "The A.R.K. Project."

This study investigated the effectiveness of a unique student-led intervention in the VT community. The intervention study aimed to increase VT student safety-belt use. Intervention components belonged to the following categories: 1) Buckle-Up message A.R.K. bags; 2) pledge cards; 3) educational outreach and, 4) Buckle-Up Flashcards.

The evaluation of the intervention program included an assessment of both process and outcome components. Qualitative and quantitative methods were used to determine the relative

impact of intervention exposure on the primary dependent variable- driver shoulder safety-belt use. The research studied the notion of response generalization (Ludwig & Geller, 2001) by investigating other dependent variables such as prevalence of turn-signal use and cell-phone use. The intervention was implemented by student members of the Delta Zeta (DZ) sorority and the Sigma Phi Epsilon (Sig Ep) fraternity and field observations were collected by trained research assistants (RAs) from CABS.

The community intervention study faced the challenge of increasing safety-belt use beyond its already high baseline. In this regard, the following facts are relevant: 1) while unintentional injuries are currently ranked as the leading cause of death among young adults in the United States, use percentages were markedly lower among persons aged 16-24 years (69%) than they are among the general population (79%) in 2003 (NHTSA, 2003); 2) safety-belt use on the VT campus (77%) is lower than the national average of 80% (NHTSA, 2004) and; 3) Virginia does not have a primary state law mandating use. Under a primary state law, an officer can cite a driver for non-use of a belt and this citation need not be in combination with another primary offense- see section ‘Along Came Safety-Belt Use Laws’ below.

These three conditions placed the VT campus at higher risk for non-use of safety belts, representing an opportunity for The A.R.K. Project to help raise the percentage of safety-belt use to, at least, the national level.

Current Safety-Belt Use Among Young Adults

While unintentional injuries are currently ranked as the leading cause of death among young adults in the United States, safety-belt use percentages are markedly lower among persons aged 16-24 years (69%) than among the general population (79%) in 2003 (NHTSA, 2003). More specifically, in 2003, motor vehicle crashes lead to more fatalities (3657) and documented

injuries (308,000) among persons aged 15-20 years old than any other cause (NCSA, 2003).

Although 15-20 year olds accounted for only 8.5% of the driving population in 2003, 13.8% of all fatal crashes directly involved a person between the ages of 15-20 in 2003 (NCSA, 2003).

Teens and young adults are the most at risk to suffer from motor vehicle related morbidity and mortality, and they are also the least likely to use safety belts, suggesting many missed prevention opportunities.

Initial Efforts to Increase Safety-Belt Use: The ABC Model of Behavior Change

As any intervention researcher can attest, it is usually much easier to affect change on a target behavior when the baseline percentage of that behavior is very high or very low- depending on the desired direction of behavior change. When the percentage of safety-belt use was very low, non-punitive community efforts successfully increased safety-belt use. E. Scott Geller approached large-scale safety-belt use promotion research from a behavioral science perspective, applying the 'ABC' approach to intervention design.

With the ABC approach the 'A' represents antecedents (or activators) for the 'B' (behavior) which is then followed by a 'C' (consequence) to the behavior. Geller and colleagues noted an increase in safety-belt use following behavioral interventions which used activators. Examples of such activators were: 1) reminders; 2) prompts; 3) modeling; 4) education; 5) commitment; 6) incentives; and 7) disincentives.

Following the target behavior, Geller and colleagues used the following consequences to increase the likelihood of safety-belt use: 1) reward/positive reinforcer; 2) punisher/negative reinforcer (Geller, 1988). This intervention research evaluated a variety of intervention strategies to increase safety-belt use. A thorough review of this research is beyond the scope of

the current paper. However, a review of the most relevant intervention research in this domain is given next.

Prompts: Buckle-Up Reminder Stickers

Thyer and Geller (1987) investigated the efficacy of ‘buckle-up reminder stickers’, as activators, when placed on vehicle dashboards in plain view of front-seat passengers. This intervention took place in Pensacola, Florida prior to the introduction of primary enforcement laws. The drivers were instructed to say, “I always prefer that my passengers wear their safety belts” when passengers inquired. The stickers were withdrawn after two weeks and then replaced two week later for another two-week period. In this ABAB design, safety-belt use was measured to be 34% at baseline, 70% during the first intervention trial, 41% during the first withdrawal period, and 78% during the second intervention trial.

Pledge Cards: Buckle-Up Pledge Cards

Geller and Lehman (1991) found ‘Buckle-Up promise cards’ to be successful and versatile activators for safety-belt use behavior. Prior to the implementation of secondary law enforcement, the VT campus was the site of several successful large-scale intervention studies targeting safety-belt use. Between the years of 1984 and 1986, a commitment/incentive program successfully increased safety-belt use on the VT campus. Using a system of pledge cards and real time prompts (i.e., Buckle-Up reminder cards hanging from rearview mirror), faculty participants increased their belt use from baseline (56.4%) to a follow-up percentage of 75.9%. Students increased their percentages from baseline (49.3%) to a follow-up percentage of 69.8% (Geller, Lehman, Kalsher, & Rudd, 1987).

Buckle-Up Flashcards

An inter-personal “Flash-for-Life” prompt to increase safety-belt use was evaluated in the 1980’s (Geller, Bruff, & Nimmer, 1985). This prompting technique was successful at a time when safety-belt use ranged from 10-20% (Dihn-Zarr et al., 2001). These field studies found that about 20% of un-buckled vehicle drivers complied with the “Flash-for-Life” prompting technique. This intervention involved one person (the flasher) displaying an 8 ½ x 11 inch flashcard reading, “Please Buckle-Up I Care” to un-buckled vehicle occupants. When the targeted occupant complied, the flasher flipped the card over to display the message, “Thank You for Buckling-Up.” If the vehicle driver was already buckled, the message “Thank You for Buckling-Up” was flashed.

In 1984, the “Flash for Life” technique was delivered by the child or college-student passenger of a vehicle stopped at an intersection while an observer recorded compliance with the requests. This occurred in two Virginia towns, one university town and one surrounding town. Of 1,087 drivers, 82% looked at the flashcard. Of those who were un-buckled, 22% complied and buckled-up on the spot. Mean compliance with the request was significantly higher in the university town (22%, $p < .05$) than in the non-university town (14%).

When this technique was applied at a Florida university, students held the flashcards at entrances and exits of parking lots. An ABAB design was used, with conditions changing weekly. Observational data on total safety-belt use were gathered and functional control demonstrated. During the baseline phase, 19.55% ($n=629$) of drivers were buckled. During the first intervention phase, 45.5% of drivers were buckled ($n=635$) and during the withdrawal phase, 28.5% were buckled ($n=634$). When the intervention was re-introduced, the observed safety-belt use rate increased to 51.5% ($n=625$).

Since these early studies, safety-belt use percentages have skyrocketed to the current estimate of 80% (N.H.T.S.A., 2004). Today, researchers and policy makers are hard pressed to develop intervention strategies that can increase safety-belt use among the estimated 20% of the U.S. population who do not buckle up.

Along Came Safety-Belt Use Laws

In the U.S., every state and territory, except New Hampshire, has enacted a driver safety-belt use law, but each state varies in promotion and implementation. The most influential discrepancy is primary vs. secondary enforcement. Under a primary law, a driver may be cited for non-use of a safety belt in the absence of a concurrent moving or traffic violation. However, under a secondary law, a driver must first be cited for another moving or traffic violation before a citation for non-use of a safety belt may be given (www.thecommunityguide.org/mvol, 2002).

In 1984, New York enacted the first mandatory safety-belt law. Illinois and Michigan passed similar laws the following year. The New Jersey legislature developed the concept of secondary enforcement based on constituents' concerns about the potential for police harassment and infringement on individual rights. And so, the 1985 New Jersey law included secondary enforcement provision. Under this secondary law, a driver could not be cited for violation of safety-belt use without primary concern over another traffic or moving violation (Eby, Vivoda, & Fordyce, 2002). To this day, states have control over primary or secondary status of their respective safety-belt use laws.

Current prevalence of safety-belt use is higher in states with primary enforcement. Results from the 2003 probability-based observational National Occupant Protection Use Survey (NOPUS) found average driver safety-belt use prevalence to be 75% in states with secondary enforcement and 83% in states with primary enforcement (NHTSA, 2003). Virginia currently

operates under secondary law enforcement, and while there have been proposals to switch to primary enforcement, such legislation has not been passed.

Enhanced Enforcement: The Current 'Best Practice'

In 2005, U.S. safety-belt use was higher than it has ever been. Many credit this to primary and secondary enforcement policies. The dominant approach to safety-belt use promotion is now punitive in nature, and prominent government and grassroots promotion groups advocate for the combined use of enforcement and community promotion programs. *The Community Guide* (2002), a compilation of recommendations for prevention of motor vehicle-related injuries recommends safety-belt use laws (primary enforcement), and enhanced enforcement programs. Enhanced enforcement programs are designed to increase public awareness of law enforcement efforts; these programs advertise enforcement via marketing and advertisement of certain punitive risk associated with non-use. According to Dihn-Zarr et al. (2001), it is hypothesized that when both perceived risk of detection and punishment are coupled with increased awareness of safety-belt laws, belt use increases.

For instance, a North Carolina awareness-raising program, in the context of the 'Click It or Ticket' enforcement program was evaluated by Wells, Malenfant, Williams, and Van Houten (2000). The awareness-raising program took place during a window of time when enforcement was not taking place, to eliminate confounding effects of enforcement and outcomes associated with the placement of feedback signs in the parking lots of community shopping centers which displayed local use percentages and information about the benefits of use (i.e., lives saved, costs saved) with reminders to buckle-up. Similar information was displayed on posters and flyers. Researchers concluded that observed driver safety-belt use percentages increased significantly from a 73-74% range to an 83-85% range at all sites. No difference in observed safety-belt use

was found when enforcement resumed. It was suggested, based on results from this study, that feedback signs, posters, and flyers could be used successfully in future community awareness efforts in the absence of concurrent enforcement efforts.

According to recommendations from the 2001 Seat Belt Summit, a gathering of leaders in policy and research, current safety-belt promotion efforts should include: 1) primary law enforcement; 2) increased public awareness of risk for non-trivial fines for non-use; 3) license points for non-use; and 4) effective vehicle technology to ‘induce’ use. The group recommends that advertising alone, without an enforcement component, and the use of trinkets should be ‘minor’ components of safety-belt promotion programs. These suggestions are based on a review of the research literature and government reports. Perhaps the most salient outcome from this summit was acknowledgement that current non-users are unlikely to respond to a single approach to safety-belt use promotion (Automotive Coalition for Traffic Safety, Inc., 2001).

CHAPTER 2

Rationale

Although safety-belt use continues to increase in a linear fashion, motor vehicle crashes remain the leading cause of death for people age 15 to 20 years of age in the U.S. (NCSH, 2003). Federal, state, and local initiatives have been launched to reduce the economic and human costs of morbidity and mortality due to such crashes. Many such initiatives focus on increasing the use of safety belts. According to the National Highway Traffic Safety Administration (NHTSA), safety belts are 50% effective at preventing death in crashes in which motorists would otherwise suffer fatal injuries (2003). Indeed, safety-belt use is thought to be the most effective means of reducing motor vehicle crash related morbidity and mortality.

There have been many successful approaches to increasing safety-belt use since their introduction in 1959, and a steady increase in safety-belt use has been documented. However, as use increases, it also becomes increasingly difficult to create effective non-punitive safety-belt use promotion programs and to date; researchers and practitioners have not found a successful intervention to increase safety-belt use beyond 80% without the use of law-based interventions.

This study approached the promotion of safety-belt use following the preventable motor vehicle-related death of VT student, Ashley Ryan Krueger. The motivation for this intervention was actually conceived by Ashley's friends in the DZ sorority and the Sig Ep fraternity. They took an active role in the planning and implementation process of "The A.R.K. Project" under the author's direction.

The main challenge for the author was to design, implement, and evaluate a safety-belt use promotion program to affect change in a population with a relatively high base percentage of the target behavior. There is no model or theory that nicely fits this naturally-occurring opportunity to collaborate with the motivations of the natural grass-roots community leaders, the available resources, and the demands of a rigorous behaviorally-based research design. Therefore, in the spirit of social validity, the proposed study followed the sage advice of Nathan Azrin (1977), we first worked to get an effect and then considered possible contributions of individual intervention components in later phases of this programmatic research.

Pilot Study

The aim of the pilot study was to assess the baseline percentage of safety-belt use on the VT campus and intervene at the community level to increase the observed prevalence estimate. Observational data were collected before, during, and after a week of intervention activities.

Method

Participants & setting. The study took place on the VT campus during the Fall semester of 2004. VT is a large regional public university located in Blacksburg, Virginia (pop. 39,500). There were approximately 25,000 students enrolled and 1563 faculty employed at VT. The parking services department of VT issued parking permits to 14,975 students and 4,674 faculty/staff for the 2004/2005 academic year.

Intervention. The community-level intervention lasted one week and consisted of several components: 1) prompts; 2) education; 3) fundraising/awareness raising efforts; 4) pledge cards; and 5) Buckle-Up Flashcards. The prompts consisted of a static sticker and a plastic wristband with the embossed message “Buckle Up for Someone You Love—A.R.K”. See Appendix A for Static Sticker and Wristband. Educational efforts included a campus event, attended by over 400 students, which included a speech delivered by E. Scott Geller, musical performances, and raffles (with prizes donated from local merchants). See Appendix A for Press Coverage: Sample. In addition, several educational/promotional booths were placed in university commons areas throughout the week. Fundraising/awareness efforts included solicitation of money from DZ sorority parents, Sig Ep fraternity parents, and local businesses to supplement intervention activities funding.

The pledge component of the intervention consisted of a process by which individuals were required to sign a pledge to ‘A.lways R.emember to K.lick it and ask others to do the same’ prior to receiving special prompts (i.e., a wristband and a static sticker). However, adherence to this procedure was not enforced. The participants received a wallet-sized card to carry with them to remind them to buckle up, an additional prompt. See Appendix A for Pledge Card and Pledge Process: Photo.

The inter-personal Buckle-Up Flashcards component used hand-held flashcards to encourage drivers to buckle-up at exits of campus parking lots. Trained CABS research assistants (RAs) and trained members of the DZ sorority and the Sig Ep fraternity were paired and each pair-member was assigned a role. One RA was a ‘flasher’ and one was a ‘clicker’. The pairs were positioned at exits of campus parking lots. Un-buckled drivers were flashed an 11”x14” card which said, “Please Buckle Up- I Care” and if the driver complied with the request, the flasher flipped the card over to show them a message which said, “Thank You for Buckling Up.” During this exchange, the clicker research assistant held two hand-held ‘clickers’ and counted the number of flashes and the number of successes (driver complied with the request). See Appendix A for Buckle-Up Flashcard Front and Back, Buckle-Up Flashcard Protocol and, Buckle-Up Flashcard Data Collection Sheet. The data collectors did not always adhere to the protocol, and this led to missing data and uninterruptible results.

The intervention was almost entirely implemented and staffed by the DZ sorority and the Sig Ep fraternity. The author planned and coordinated the intervention programming. Intervention materials were initially financed though Dr. Geller who was later reimbursed following fundraising activities.

Data collection. Observational data were collected before, during, and after the intervention by trained CABS RAs and by trained members of the DZ sorority and the Sig Ep fraternity. Data collectors were instructed to record field observations onto data sheets (see Appendix A for VT Field Observation Data Collection Protocol). Field observations were made at six locations, at two times daily, Monday through Friday, beginning on September 4, 2004 and ending on December 8, 2004. Inter-observer reliability was collected on 19% of observations.

Measures. A data sheet was developed and used to record field observations (see Appendix A for VT Field Observation Data Collection Sheet). Observational data were collected on: 1) demographic characteristics (i.e., gender, university status- faculty/staff, undergraduate student, or graduate student); 2) driver and front-seat passenger shoulder safety-belt use; 3) use of turn signals; 4) complete stops at signs or lights; 5) stopping for pedestrians crossing at crosswalks; and 6) vehicle type (car, truck, sports utility vehicle).

Analyses.

Data were analyzed with the SPSS software program. Percentages of driver safety-belt use were computed for observations made before, during, and after the intervention by gender and permit type. Percentages were also computed for prevalence of turn-signal use before, during, and after the intervention.

Results.

A total of 11,582 behavioral observations of driver safety-belt use were made, including 6553 (56%) female drivers and 5018 (44%) male drivers. Of these, 72% displayed student parking permits, 25% displayed faculty/staff parking permits and 3% displayed no parking permits. A total of 62% drove cars, 13% drove pick-up trucks, and 25% drove sports utility vehicles. Overall, 49% of the observations were collected between 12:30 pm and 1:30 pm and 51% were collected between 4:00 pm and 5:30 pm at six campus locations. See Appendix A for Map: VT Field Observation Sites.

There were no significant increases in safety-belt use following the intervention. Prior to the intervention, safety-belt use was 77% ($n=8251$). During the intervention, 1278 field observations put safety-belt use at 74%. Following the intervention, 2053 observations revealed

a belt use rate of 77%. Turn-signal use also remained stable throughout the study. Turn-signal use was 75% before the intervention ($n = 3950$), 75% during the intervention ($n = 24$), and 77% ($n = 738$) following the intervention.

Limitations.

There were numerous limitations to the pilot study which threatened both validity and reliability, all of which were considered during the development of the current study. For example, the intervention materials were not tightly controlled and measures of intervention exposure were not obtained. This posed a threat to internal validity. For instance, the intervention was designed to be implemented in a one-week time period; however, the researchers continued to distribute the wristbands after that one-week period had ended. Furthermore, instrumentation changes (i.e., the data collection sheet was revised several times during data collection) threatened internal validity. Threats to statistical conclusion validity included: 1) extraneous variance in the experimental setting (i.e., concurrent town police campaign to increase belt use), 2) unreliability of intervention implementation- the intervention protocol was not well-planned and implemented, and 3) limited tests of inter-observer reliability (i.e. only 19% of total observations).

Attempts to gather reliable observational data were not as successful as expected. This was mainly due to the fact that the data were collected largely by members of the DZ sorority and Sig Ep fraternity who were unfamiliar with research methodology. Although numerous trainings were held to promote the understanding of data collection procedures and the importance of reliability, the data collectors continued to make major errors while observing and recording data.

Current Study

This study investigated the effectiveness of a unique student-led intervention in the VT community to raise student driver safety-belt use. The A.R.K. Project Buckle-Up Hokies Week (intervention) took place April 11th-April 15th, 2005. During the week, the student community received the following intervention components: 1) Buckle-Up message A.R.K. bags; 2) pledge cards; 3) educational outreach, and 4) Buckle-Up Flashcards. The evaluation of the intervention program consisted of both process and outcome assessment techniques. Both qualitative and quantitative methods were used to determine the influence of the intervention on the primary dependent variable, student driver safety-belt use. This study also considered the notion of response generalization by investigating other dependent variables such as prevalence of turn-signal use and cell-phone use.

The intervention was implemented by student members of the DZ sorority and the Sig Ep fraternity. The intervention was planned and implemented in a collaborative effort between the author and project leaders. See Appendix B for Description of Leader Positions. All observations were accomplished by trained RAs from CABS.

Methods

Participants & setting. The study took place on the VT campus during the Spring semester of 2005. VT is a large regional public university located in Blacksburg, Virginia (pop. 39,500). There were approximately 25,000 students enrolled and 1563 faculty employed at VT. The parking services department of VT issued parking permits to 14,975 students and 4,674 faculty/staff for the 2004/2005 academic year.

A total of 17,631 vehicle observations occurred at VT during the study. Of these observations, 5681 were gathered before the intervention week (pre-intervention phase), 2456

observations took place during the intervention week (intervention phase), 5526 took place immediately after the intervention week (post-intervention phase), and 3968 observations were gathered during the follow-up phase. Of these observations, 2964 (16.8 %) were made between 8:00 am and 9:00 am, 31.1 % ($n = 5478$) were made between 9:30 am and 10:30 am, 27.9% ($n = 4925$) were made between 12:00 pm and 1:00 pm, and 24.2 % ($n = 4264$), were made between 4:30 pm and 5:30 pm. Of all drivers, 40 % were female ($n = 7044$), and 60% were male ($n = 10,587$). Of these drivers, 7161 (40.6 %) were faculty staff and 59.4% were students ($n = 10470$). Of students, 3804 (37%) were female and 6666 were male (63 %). Of faculty, 46% were female ($n = 3240$) and 54% ($n=3921$) were male.

Field data on student safety-belt use were obtained at a non-equivalent control site-- RU, in Radford, Virginia. RU is a medium-sized, public university located 45 miles southwest of Roanoke, Virginia, on Interstate Highway 81. It is located in the New River Valley between the Blue Ridge and Allegheny Mountains in Radford, Virginia (pop. 15,900). Approximately 9,329 students were enrolled and approximately 353 faculty/staff were employed at RU during the 2004/2005 academic year. The parking services department of RU issued parking permits to roughly 6,000 students and faculty/staff for the 2004/2005 academic year.

A total of 789 observations on drivers' safety-belt use, turn-signal use, and cell-phone use were made at RU during the study. Of these observations, 231 occurred before the intervention week (pre-intervention phase), 119 during the intervention week (intervention phase), 211 immediately after the intervention week (post-intervention phase), and 228 observations took place during the follow-up phase. All observations were made between 10:30 am and 11:30 am on Tuesdays and Thursdays. Of all drivers, 62% were female ($n= 395$), and 38% were men ($n= 245$). All drivers were students.

The community-level intervention (Buckle-Up Hokies Week) endured for one school week (April 11-April 15) and it included the following campus-wide components: 1) Buckle-Up message A.R.K. bags; 2) pledge cards; 3) educational outreach and; 4) Buckle-Up Flashcards.

Buckle-Up message A.R.K. bags. Buckle-Up message A.R.K. bags were available for purchase at campus points of educational outreach (\$2 for an A.R.K. bag containing a static sticker + wristband). See Appendix B for Wristband and Static Sticker. Eligibility to purchase prompts was contingent upon pledging at point-of-purchase.

Pledge cards. Individuals were required to sign a pledge (see Appendix B for Pledge Card and Pledge Card Process: Photo) to ‘A.lways R.emember to K.lick it and ask others to do the same prior to receiving a wristband and static sticker. The tear-off pledge card consisted of two parts. The pledgers recorded their names and email addresses on one part retained by the author. The pledger received the other portion of the wallet-sized tear-off card with the following information: “I promise to buckle up and ask others to do the same.”

Educational outreach. The following campus activities prompted vehicle safety-belt use:

- 1) multiple student-staffed educational outreach booths at campus locations
(See Appendix B for Educational Outreach Locations and Photos.),
- 2) banners and signs promoting Buckle-Up Hokies Week at various campus locations (See Appendix B for Logo and Slogan.),
- 3) media package including: print, email, Internet social marketing (See Appendix B Press Release and two Print Advertisements.),
- 4) wrecked vehicle located in public campus area adjacent to an educational outreach booth (See Appendix B for Wrecked Vehicle on the Drillfield with Vince and Larry: Photos.),

- 6) benefit concert named “AshFest.” All proceeds were donated to cover operating costs of The A.R.K. Project and all additional monies were donated to the Ashley Ryan Krueger Scholarship fund as indicated at an adjacent on-site educational outreach table (See Appendix B for Print Advertisement).

Buckle-Up Flashcards. The Buckle-Up flashcard intervention component was implemented on four consecutive days, during three one-hour sessions per day. Trained RAs were paired and assigned specific roles. One RA delivered the flashcard messages and one RA collected observational data. The flasher identified oncoming vehicles and informed the data collector which vehicle to observe. After determining whether the driver was buckled or unbuckled, the flasher showed the relevant side of the flashcard. If the driver was buckled, the flasher displayed the message, “Thank You for Buckling-Up.” If the driver was not buckled-up, the flasher displayed the message, “Please Buckle-Up I Care.” If the driver complied with the request and buckled-up, the flasher displayed the message, “Thank You for Buckling-Up.” See Appendix B for Buckle-Up Flashcard: Front and Back View. Observational data were collected on: driver gender, driver buckled or not-buckled before the flashcard prompt and, driver buckled or not-buckled after the prompt. See Appendix B for Buckle-Up Flashcard: Data Collection Protocol and Buckle-Up Flashcard: Data Collection Sheet.

Procedures for campus data collection. Observational data were taken before, during, and after Buckle-Up Hokies Week by trained RAs from CABS. Data were taken at four campus locations, Monday-Thursday beginning on March 28, 2005 and ending on April 29, 2005. In addition, data were taken for a two-week period (follow-up phase) during the fall semester of 2005 (September 12, 2005-September 22, 2005).

Observations occurred at two sites within a faculty parking lot (Derring parking lot) between 8:00 am and 9:00 am and between 4:30 pm and 5:30 pm. Observations were made at two sites within a student parking lot (Prices Fork parking lot) between 9:30 am to 10:30 am and between 12:00 pm and 1:00 pm. See Appendix B for VT Field Observations Data Collection Protocol and Map: VT Field Observation Sites. In addition, field data on safety-belt use among students were obtained at RU on Tuesdays and Thursdays from 10:00 am-11:00 am at two locations within a student parking lot during each of the four phases. This site served as a non-equivalent control.

An observational checklist was developed and used (see Appendix B for VT and RU Field Observation Data Collection Sheets). Field observations were made systematically on driver gender, driver safety-belt use, driver turn-signal use, and driver cell-phone use. Industrial vehicles were excluded from observation (including VT vehicles) because many were equipped with only lapbelts.

A representative random probability sampling technique was used to take field observations. Specifically, RAs observed vehicles at random, depending on the speed at which they were able to record data. Inter-observer reliability data were collected on 39% of the field observations by paired RAs making concurrent independent observations of the same vehicle. See Appendix B for VT and RU Field Observations Data Collection Protocols.

Procedures for observational data collection for Buckle-Up Flashcards. The Buckle-Up Flashcard intervention component was implemented on four consecutive days, during three one-hour sessions per day. Trained RAs were paired and assigned specific roles. One RA delivered the flashcard messages and one RA recorded observational data. The flasher identified oncoming vehicles and informed the data recorder which vehicle to observe. After determining

whether the driver was buckled or un-buckled, the flasher showed the relevant side of the flashcard. If the driver was buckled, the flasher displayed the message, “Thank You for Buckling-Up.”

If the driver was un-buckled, the flasher displayed the message, “Please Buckle-Up I Care.” If the driver complied with the request and buckled-up, the flasher displayed the message, “Thank You for Buckling-Up.” Observational data were taken on: driver gender, driver buckled or un-buckled before the flashcard prompt and driver buckled or un-buckled after the prompt. See Appendix B for Buckle-Up Flashcard: Data Collection Protocol, Buckle-Up Flashcard: Data Collection Sheet, Buckle-Up Flashcard: Front and Back View.

Process evaluation: intervention components. During the intervention week, data on direct exposure to intervention components and data on self-reported exposure to intervention components were collected. Specifically, data were gathered daily on: 1) number of pledge cards signed per educational outreach table, 2) number of Buckle-Up message A.R.K. bags distributed per educational outreach table, and 4) number of driver contacts made with the Buckle-Up flashcard.

In addition, a web-based survey was emailed to randomly selected students and faculty/staff to assess their exposure to the related intervention components. A link to a web-based survey was emailed to 300 randomly selected faculty/staff and 300 students at VT on April 25, 2005. Email addresses were randomly chosen by selecting every tenth address from the VT directory. Only email addresses were taken from the directory. No other identifying information was gathered. “Do you know about The A.R.K Project” was written in the email subject line. The survey took approximately five minutes to complete. No compensation was offered. See Appendix B for Web-based Survey Email Description and Web-based Survey.

Process evaluation: planning and implementation. The planning and implementation processes of the project leaders were informally discussed on a regular basis to guide the author in providing constructive feedback regarding organizational structure and communication strategies. Through these informal conversations, project leaders were able to give and receive feedback regarding adherence to the study's protocols.

To evaluate the intervention delivery process at educational outreach booths, a manipulation check was performed by CABS RAs trained as "secret shoppers". See Appendix B for Secret Shoppers Manipulation Check Protocol and Secret Shoppers Manipulation Check Data Sheet. These RAs approached all five educational outreach booths during one-hour sessions. The order in which secret shoppers visited each booth was up to their discretion. On the first day of Buckle-Up Hokies week, one secret shopper approached each educational outreach booth during five one-hour shifts. During the remaining four days, three one-hour secret shopper shifts were assigned.

For each educational outreach booth visit, secret shoppers were instructed to: 1) approach table.; 2) ask what The A.R. K. Project is.; 3) ask how you can buy a bag.; 4) ask if you can buy more than one bag.; 5) go through the process of pledging and buying a bag. These RAs were equipped with funds (by the researcher) to buy Buckle-Up message A.R.K. bags containing static stickers and wristbands.

The secret shoppers were instructed to write "SS" on the pledge cards they signed, to insure the researcher did not include these pledges in the intervention exposure results. Information gathered from the secret shoppers' experiences was used by the researcher and the project leaders to guide on-going feedback to the various intervention agents regarding adherence to the intervention delivery protocol.

Analyses

It was hypothesized VT student belt-use and turn-signal use would be higher in the intervention phase than in the pre-intervention phase. It was predicted these levels would remain stable, or decrease slightly, during the post-intervention phase and fall slightly during the follow-up phase. Also, it was hypothesized VT student cell-phone use during the intervention phase would be less than pre-intervention phase levels, and cell-phone use during the post-intervention phase would remain stable or increase slightly. It was predicted the follow-up phase levels of cell-phone use would be higher than post-intervention phase levels but not as low as pre-intervention phase levels. If no response was found in VT safety-belt use, as a function of the intervention, covariation among safety-belt use, turn-signal use, and cell-phone use among aggregate data would be investigated.

VT student, VT faculty/staff, and RU student safety-belt use, cell-phone use, and turn-signal use were compared through graphic visual inspection of daily means and means by phase. Consistent with the applied behavior analysis perspective, visual inspection of this time series data directed further inferential analyses.

Additionally, the author hypothesized that the Buckle-Up Flashcard intervention component would lead to an immediate and significant increase in safety-belt use due. Specifically, it was hypothesized that a statistically significant amount of un-buckled VT student drivers would comply, immediately, with the inter-personal, peer-delivered request to buckle-up.

Results

Inter-observer reliability. Inter-observer reliability was obtained on 39% of the 17631 observations made at VT. Among the paired observers at VT, 96% agreed for safety-belt use, 91% agreed for turn-signal use, 99% agreed for cell-phone use, and 98% agreed for cell-phone

use. Inter-observer reliability was obtained on 87% of the 685 observations made at RU. Among paired observers at RU, 94% agreed for safety-belt use, 89% agreed for turn-signal use, 98% agreed for cell-phone use and, 99% agreed for gender.

Safety-belt use: time series.

A time series analysis of the daily percentages of VT faculty/staff, VT students, and RU students are displayed in Figure 1. Visual inspection of these data suggest that VT faculty/staff were more likely to use safety-belts than VT students, regardless of phase.

Time series data of daily and phase percentages for safety-belt use percentages of all males vs. females, in aggregate, are displayed in Figure 2. Visual inspection of these data suggest that females were more likely to use safety belts than males.

Percentages of safety-belt use were calculated by day and by phase for all observed drivers, in aggregate, and for the following subgroups: VT faculty/staff, VT students, RU students, VT females, VT males, VT faculty/staff females, VT faculty/staff males, VT student females, VT student males, RU student females, and RU student males.

Overall, 83.5% of the 18,420 observed drivers were buckled-up. Percentages of safety-belt use per phase were: 82% of 5681 during the pre-intervention phase, 83% of 2456 during the intervention phase, 86% of 5526 during the post-intervention phase, and 86% of 3968 during the follow-up phase. Overall, 82% of the 10,470 VT students observed were buckled-up. The percentages of VT students buckled-up in each phase were: 80% of 3175 during the pre-intervention phase, 81% of 1592 during the intervention phase, 85% of 3363 during the post-intervention phase, and 82% of 2340 during the follow-up phase. Overall, 87% of the 7161 VT faculty/staff observed were buckled-up. The percentages of VT faculty/staff buckled-up in each phase were: 85% of 2506 during the pre-intervention phase, 87% of 864 during the intervention

phase, 87% of 2163 during the post-intervention phase, and 90% of 1628 during the follow-up phase. Overall, 70% of the 789 RU students observed were buckled-up. Per phase, the percentages of those who were buckled were as follows: 71% of 231 during the pre-intervention phase, 71% of 119 during the intervention phase, 72% of 211 during the post-intervention phase, and 68% of 228 during the follow-up phase.

Of all 7549 VT faculty/staff, VT student, and RU student females, 6512 (86%) were buckled-up. The percentages of all females buckled-up in each phase were: 85% of 2414 during the pre-intervention phase, 83% of 1019 during the intervention phase, 88% of 2317 during the post-intervention phase, and 87% of 1799 during the follow-up phase. Of all 10,871 VT faculty/staff, VT student, and RU student males, 8868 (82%) were buckled-up. The percentages of all males buckled-up in each phase were: 79% of 3498 during the pre-intervention phase, 82% of 1556 during the intervention phase, 83% of 3420 during the post-intervention phase, and 83% of 2397 during the follow-up phase. The percentages of VT student males buckled-up in each phase were: 77% of 2041 during the pre-intervention phase, 80% of 1033 during the intervention phase, 83% of 2156 during the post-intervention phase, and 80% of 1436 during the follow-up phase. The percentages of VT student females buckled-up in each phase were: 84% of 1134 during the pre-intervention phase, 84% of 559 during the intervention phase, 88% of 1207 during the post-intervention phase, and 87% of 904 during the follow-up phase. The percentages of VT faculty males buckled-up in each phase were: 82% of 1384 during the pre-intervention phase, 89% of 488 during the intervention phase, 86% of 1183 during the post-intervention phase, and 90% of 866 during the follow-up phase. The mean percentages of VT faculty females buckled-up in each phase were: 88% of 1122 during the pre-intervention phase, 85% of 376 during the

intervention phase, 89% of 980 during the post-intervention phase, and 90% of 762 during the follow-up phase.

Safety-belt use: chi-square. Chi-Square was used to investigate the relation between safety-belt use and phase. A 2x4 contingency table was derived from the frequencies of safety-belt use vs. non-use among VT faculty/staff and VT students across four phases. The resultant χ^2 was 41.41 (3), $p < .0001$, indicating statistically significant dependence between safety-belt use of the entire VT community and phase. Specifically, safety-belt use increased from 82% during the pre-intervention phase, to 83% during the intervention phase, to 86% during the post-intervention phase. It stayed stable at 86% during the follow-up phase.

Chi-Square analysis was used to investigate the apparent difference between the belt-use of VT faculty/staff vs. VT students. A 2x2 contingency table was derived from the frequencies of VT faculty/staff vs. VT students using vs. not-using vehicular safety-belts. The resultant χ^2 was 73.35 (1), $p < .0001$, indicating VT faculty/staff were significantly more likely than students to use vehicular safety-belts. More specifically, of the 7161 observations on VT faculty/staff, 6226 (87%) were buckled-up across all phases of the study, while 82% of 10,470 VT students observed were buckled-up.

Chi-Square was used to investigate apparent dependency between gender of driver and safety-belt use combined among VT students and VT faculty/staff. A 2x2 contingency table was derived from the frequencies of all VT faculty/staff and VT students aggregated across all phases, comparing safety-belt use vs. non-use with male vs. female gender. The resultant χ^2 was 80.68 (1), $p < .0001$, indicating females were significantly more likely than males to use vehicular safety-belts. Of the 7044 females observed, 87% were buckled-up across all phases of the study, while 82% of the 10,587 observed males were buckled-up.

Cell-phone use: time series.

A time series analysis of the daily percentages of cell-phone use among VT students, VT faculty/staff, and RU students are displayed in Figure 3. Visual inspection of these data suggest VT faculty/staff were less likely to use cell phones while driving than VT students.

Percentages of cell-phone use were calculated by day and by phase for all observed drivers, in aggregate, and for the following subgroups: VT faculty/staff, VT students, and RU students. Overall, 4% of the 18,420 observed drivers were using cell phones.

Overall, 4% of 10,490 VT students were using a cell phone when observed. The percentages of VT students using cell phones per phase were: 5% of 3195 during the pre-intervention phase, 4% of 1592 during the intervention phase, 3% of 3363 during the post-intervention phase, and 3% of 2340 during the follow-up phase. Overall, 3% of 7161 VT faculty/staff were using cell phones when observed. The percentages of VT faculty/staff using cell phones per phase were: 3% of 2506 during the pre-intervention stage, 4% of 864 during the intervention stage, 3% of 2163 during the post-intervention phase, and 3% of 1628 during the follow-up phase. Overall, 6% of 789 of RU students were using cell phones when observed. The percentages of RU students using cell phones per phase were: 7% of 231 during the pre-intervention stage, 6% of 119 during the intervention stage, 7% of 211 during the post-intervention phase, and 3% of 228 during the follow-up phase.

Cell-phone use: chi-square. Chi-Square analysis investigated the apparent difference in cell-phone use among VT faculty/staff vs. VT students. A 2x2 contingency table was derived from the frequencies of VT faculty/staff status vs. VT student status and cell-phone use vs. non-use. The resultant χ^2 was 4.58 (1), $p < .01$, indicating VT students were significantly more likely

than VT faculty/staff to use cell phones while driving a vehicle. Of the 10,470 VT students observed, 4% were using cell phones while driving compared to 3% of 7161 VT faculty/staff.

Because no marked change in safety-belt use occurred as a function of the intervention, it was not relevant to examine response generalization to cell-phone use. However, Chi-Square analysis investigated the covariance between safety-belt use and cell-phone use among VT students, VT faculty/staff, and RU students in aggregate. A 2x2 contingency table was derived from the aggregate frequencies of cell-phone use vs. safety-belt. The resultant χ^2 was 50.80 (1), $p < .0001$. This indicated drivers who use safety-belts are significantly less likely than those who do not use safety-belts to use cell phones while driving. In the 3040 instances where the driver was un-buckled, 6% were using cell phones, while in the 15,380 instances where the driver was buckled, only 3% of drivers were using cell phones.

Turn-signal use: time series.

A time series analysis of the daily percentages of turn-signal use among VT students, VT faculty/staff, and RU students are displayed in Figure 4. Visual inspection of these data suggest VT faculty/staff are more likely to use turn signals, than VT students to indicate turns while driving. Data were not recorded on the direction of turns so, that information is not available for consideration.

Percentages of turn-signal use were calculated by day and by phase for all observed drivers, in aggregate, and for the following subgroups: VT faculty/staff, VT students, and RU students. Overall, of the 8651 turns made, 79% were indicated by a turn signal.

Overall, of the 5542 turns made by VT students, 67% were indicated by a turn signal. The percentages of turns indicated by a turn signal by VT students, in each phase, were: 62% of 1063 during the pre-intervention phase, 68% of 613 during the intervention phase, 66% of 1180

during the post-intervention phase, and 72% of 819 during the follow-up phase. Overall, of the 5052 turns made by VT faculty/staff, 84% were indicated by a turn signal. The percentages of turns, indicated by a turn signal by VT faculty/staff in each phase were: 86% of 1815 during the pre-intervention phase, 99% of 609 during the intervention phase, 95% of 1459 during the post-intervention phase, and 94% of 1169 during the follow-up phase. Overall, of the 322 turns made by RU students, 94% were indicated by a turn signal. The percentages of turns indicated by a turn signal by RU students, in each phase, were: 93% of 95 during the pre-intervention phase, 90% of 63 during the intervention phase, 94% of 98 during the post-intervention phase, and 100% of 66 during the follow-up phase.

Turn-signal use: chi-square. Chi-Square was used to investigate the apparent interdependence between turn-signal use and status of driver (VT faculty/staff vs. VT students). A 2x2 contingency table was derived from the frequencies of safety-belt use among VT faculty/staff vs. VT students and turn-signal use. The resultant χ^2 was 1035.21 (1), $p < .0001$. This indicated VT faculty/staff are significantly more likely than VT students to use turn signals to indicate a turn. VT faculty/staff used turn signals in 84% of 5052 turning instances while 67% of 5542 turns were indicated VT students.

Because no increase in safety-belt use occurred as a function of the intervention, it was not relevant to examine response generalization to turn-signal use. However, Chi-Square was used to investigate the covariance between safety-belt use and turn-signal use among VT students, VT faculty/staff, and RU students in aggregate. A 2x2 contingency table was derived from the aggregate frequencies of turn-signal use vs. non-use and safety-belt use vs. non-use. The resultant χ^2 was 31.60 (1), $p < .0001$, indicating that drivers who use safety belts are significantly more likely than those who do not use safety-belts to use turn signals to indicate a

turn. Of the 9482 turns made by buckled drivers, 80% were indicated by turn signals while of the 1434 turns made by un-buckled drivers, only 74% were indicated by a turn-signal.

Intervention component: Buckle-Up Flashcard. For the Buckle-Up Flashcard intervention component, a total of 2,088 student drivers were observed and the inter-observer reliability was high. Of the 2088 concurrent observations, 99.5% of paired observers agreed on initial safety-belt use (buckled vs. un-buckled) and compliance with flashcard request. At the time of initial observation, 79.5% of the 2088 drivers were buckled-up and 20.5% were not buckled-up. Of the 427 drivers who were not buckled and were flashed the message, “Please Buckle-Up I Care,” 128 (30%) of these drivers complied with the request.

A 2x2 contingency table was derived from the frequencies of compliance by not-buckled male vs. female drivers prompted by a male vs. female flasher and results are shown in Figure 5. The resultant χ^2 was 2.38 (1), $p < .09$, indicating a trend towards interdependence. This occurred because the greatest impact of the flashcard prompt (i.e., 37% compliance) occurred in the 168 instances when the flasher was a female and the driver was a male. The lowest impact of the flashcard intervention (i.e., 21% compliance) occurred in the 145 instances when the flasher and the driver were male. In the 56 cases when the flasher was a male and the driver was a female, 30% of the drivers complied, and in the 58 cases when the flasher and driver were both female, 33% complied with the buckle-up prompt.

Intervention evaluation: pledge cards. A total of 1825 pledge cards were obtained during Buckle-Up Hokies week at educational outreach tables.

Buckle-Up Message A.R.K. bags (contained static stickers & wristbands). A total of 353 A.R.K. bags were sold for \$2.00 each during Buckle-Up Hokies week at five educational

outreach tables. Each bag contained one static sticker and one wristband, so 353 static stickers and 353 wristbands were sold during the week.

Web-based survey. Of the 300 randomly selected faculty/staff and 300 students who had the opportunity to complete the survey only 42 (7%) completed the survey. Of those who completed the survey, 20 (47.6%) were faculty/staff and 22 (52.3%) were students. Of 20 faculty/staff respondents, 90% reported they regularly use safety belts. Among 22 student respondents, 86.4% reported regular use. Of student respondents, 90.9% agreed with the statement, “Using my safety belt and asking others to do the same is a community responsibility.” In comparison, only 75% of faculty/staff respondents reported the same.

Of 22 student respondents, 9 (41%) reported they had seen the wristbands on campus but, surprisingly, only one student (4.5%) reported ownership of a wristband. Thirteen student respondents (59.1%) reported they had seen the wrecked vehicle on the campus drillfield. Three student respondents (13.6%) reported they had seen people in the campus parking lots with the “Buckle-Up” signs. Of student respondents, 36.4% reported they were aware of the opportunity to pledge, while only four student respondents (18.2%) reported they actually pledged. While 59.1% of student respondents reported they observed campus outreach tables, only two of these students (i.e., 9.1%) reported they made contact with an educational outreach booth.

Discussion

It was hypothesized that VT student belt-use and turn-signal use would be higher in the intervention phase than in the pre-intervention phase. These levels were predicted to remain stable, or decrease slightly, during the post-intervention phase and fall slightly during the follow-up phase. Furthermore, it was hypothesized that VT student cell-phone use, during the intervention phase, would be less than pre-intervention phase levels and post-intervention phase

levels were predicted to remain stable or increase slightly. Follow-up phase levels of VT student cell-phone use were predicted to be higher than post-intervention phase levels but not as low as pre-intervention phase levels. These changes were not predicted in the non-equivalent control samples (i.e., RU students and VT faculty/staff). Any concurrent changes found in the non-equivalent control group would indicate that changes in the VT students' sample might not have resulted from the Buckle-Up Hokies intervention, alone.

In fact, VT student safety-belt use did increase from the pre-intervention phase level (80%) to the intervention phase level (81%) and it increased again during the post-intervention phase (85%) then decreased slightly (82%) during the follow-up phase. While these slight changes were in the predicted direction, the author can not claim the outcomes resulted from the occurrence of Buckle-Up Hokies week. The VT student safety-belt use, by daily means and by phase, did not pass muster when compared visually to daily means and phase means among the non-equivalent control groups (e.g., VT faculty/staff, and RU students), as these daily and phase means differed in similar directions.

Furthermore, because the author does not conclude safety-belt use varied as a function of the intervention, it is not reasonable to look for response generalization to VT student cell-phone use and turn-signal use. For epidemiological purposes, these data were plotted as daily percentages and mean lines by phase in Figures 3 and 5, respectively. Although no generalization of response can be asserted, it is clear these safety behaviors co-vary. Specifically, safety-belt users are significantly more likely to indicate turns with a turn signal and are significantly less likely to use cell phones while driving.

Some additional epidemiological findings can be observed from further analyses of the data. Specifically, in this university population, with an already high base rate of the target

behavior, males are significantly less likely than females to use safety belts. Furthermore, students are significantly less likely to use safety belts and turn signals than faculty/staff, while students are significantly more likely to use cell phones while driving than faculty/staff.

Intervention components. These findings suggest Buckle-Up Hokies Week, in total, did not lead to a meaningful increase in VT student safety-belt use. Had the total intervention been effective at increasing VT student safety-belt use, while VT faculty/staff belt-use and RU student belt-use remained stable, it would have been difficult to tease out the actual contributions of three of the components with the current between-subjects methodology. For instance, it was virtually impossible to observe the behavioral effects (safety-belt use behaviors) of pledging because pledging may be a distal correlate of subsequent belt-use behavior. It was also difficult to connect behavioral correlates of antecedent prompts such as wristbands and static stickers because they are diffuse in the environment and the effects on behavior are distal as well.

Buckle-Up Flashcards. It was possible to study the immediate effects of one of the behavioral prompting intervention components and the results were very promising. The results of the impact of the Buckle-Up Flashcards suggest application of the inter-personal prompting technique can increase safety-belt use, even when belt use is already very high. This antecedent prompt correlated with immediate compliance to buckle-up among 30% of un-buckled drivers. Additionally, this prompting technique was effective at changing belt-use among one group of students who are least likely to buckle-up. Specifically, un-buckled VT males were more likely to comply, on the spot, with prompts delivered by females.

The author speculates that this inter-personal, peer-delivered prompt will produce greater immediate behavioral compliance in the context of a culture in which safety-belt use is a social norm. In the late 1980's, it was not socially normal to use safety-belts yet, Thyer, Geller,

Williams, and Purcell (1987) found a 25% compliance rate. At this time, when it is socially normal to use safety-belts, we found a striking compliance rate of 30%. This compliance rate was extraordinary considering the current high rate of safety-belt use. To emphasize this point, 30% of the 20% of drivers who were un-buckled at the time of prompt in the current study, complied with a peer's inter-personal prompt to buckle-up within a larger culture which deems use of safety-belts to be normal.

The author suggests that these findings be considered in light of a framework proposed by Geller, Berry, Ludwig, Evans, Gilmore, and Clarke (1990). Geller, et al. (1990) described a multiple intervention level hierarchy in which a given population is progressively segmented and targeted with increasingly less costly but more efficient, inter-personal, and intrusive behavior change intervention strategies. On this continuum, less intrusive and inter-personal intervention strategies may be used to target subgroups when cultural norms regarding the behavior of focus do not support the interventionists' aim. Geller et al. (1990) suggest that these types of expensive and inefficient interventions were appropriate when driver safety-belt use was low and the larger culture did not deem belt-use socially normative.

To apply these principles to intervention efforts aimed at increasing safety-belt use within a culture in which safety-belt use is normative, Geller, et. al.'s (1990) framework would suggest it be necessary to target the last 20% of un-buckled drivers with a low-cost, efficient, intrusive, and inter-personal intervention. In contrast, The A.R.K. Project, Buckle-Up Hokies Week intervention used three expensive, inefficient, un-intrusive components which did not appropriately target un-buckled drivers.

From this perspective, the author concludes three of the intervention components used in The A.R.K. Project Buckle-Up Hokies Week were too costly and inefficient to target a small

population sub-group which did not buckle-up in the cultural context of belt-use norms. The educational outreach tables, pledge cards, and Buckle-Up Message A.R.K. bags were costly, in terms of money and labor, and no change in belt-use was attributed to their implementation. None of the components intruded into the lives of un-buckled drivers, to produce behavior change. In fact, most of the community members who approached educational outreach tables, of their own volition, to pledge and purchase Buckle-Up Message A.R.K. bags were self-selected members of the 80% of drivers who already buckle-up.

In stark contrast, the Buckle-Up Flashcard component targeted only un-buckled drivers with an intrusive and inter-personal, low-cost prompt. The Buckle-Up Flashcards component was clearly less costly, more efficient, and more effective at changing observable safety-belt use among the 20% of un-buckled drivers than the less intrusive and less inter-personal other three intervention components which did not seem to target un-buckled drivers. Of the three components, empirical support for The Buckle-Up Flashcard component was the strongest and most encouraging.

Mediation and moderation. Baron and Kenny (1986) described the mediating and moderating roles of third variables in social psychological research. Specifically, mediating third variables account for the mechanism by which the focal independent variable influences the focal dependent variable. Moderating third variables can partition focal independent variables into subgroups to account for differences in the effects on a focal dependent variable. Potential third variables likely moderated and/or mediated the influence of the independent variable (Buckle-Up Hokies Week) on the focal dependent variable (VT student safety-belt use).

The intervention design was conceptualized following the death of a VT student- the namesake of The A.R.K. Project (Ashley Ryan Krueger). The personal relevance of this death,

attributable to non-use of a safety belt, among peers somehow made the intervention salient to those who personally identified with Ashley. The degree of peer likeness might have mediated the likelihood any given target would choose to participate in any of the intervention components. It is likely these peers either maintained regular belt use or became new regular belt users, in conjunction with the intervention. This ‘peer likeness’ might have mediated the change or maintenance of safety-belt use behavior (dependent variable) in conjunction with the intervention (independent variable).

In addition, the influence of the intervention on safety-belt use may have been moderated by exposure to intervention components, defined in a categorical fashion (exposed or not exposed to each component and exposed or not to the entire intervention). Also, intervention exposure was minimal with reference to the entire campus, so it is unlikely an individual exposed directly was observed driving due to the between-subjects design. Because the only intervention component which was empirically supported was the Buckle-Up Flashcards component, unbuckled VT students’ exposure to this component (exposed or not) may have moderated the effect of the intervention on safety-belt use.

Data on intervention exposure were gathered through the numbers of project materials distributed and by number of contacts made at the educational outreach booths. Ideally, the mediating effects of the intervention components on safety-belt use would have been investigated by assessing the degree of environmental exposure to each component (i.e., # of times a person observed the car on the drillfield, # of times one observed static stickers) or the degree of individual exposure to each component, defined in a continuous fashion (i.e., # of times a person wore a wristband, # of times a person saw their pledge card during the intervention week).

The web-based survey. An attempt to assess individual and environmental exposure to the intervention was made through the design and use of a web-based survey. However, of the 300 randomly selected to respond, only 42 did. No incentive compensation was offered for completion of the survey, and it is reasonable to assume those who did respond may have been a self-selected group who had interest in The A.R.K. Project because the subject in the email said, “Have you heard of the The A.R.K. Project?”

Intervention exposure among students was evaluated and curious results were found suggesting many survey answers were selected arbitrarily. Of the 22 student respondents, 13 (59%) reported they had heard of The A.R.K. Project, but only 2 of the 22 students (9%) affirmed the item “...safety-belt use increased as a result of The A.R.K. Project.” All 22 students reported they owned a static sticker, but only 5 students (22%) reported they had recently seen the static stickers on vehicles.

Because of the scant response rate, these data on individual and environmental intervention exposure did not adequately represent the target population. Furthermore, the responses reflect a random response pattern. For example, all 22 students reported ownership of a static sticker yet, only one of these students reported ownership of a wristband and four reported they signed a pledge card. These responses are incongruent as ownership of a wristband and static sticker were contingent on signing a pledge card.

Maintenance. Had intervention effects been evident among only VT students, behavior maintenance would have been important. According to Boyce and Geller (2001), behavior maintenance can be defined as the occurrence of behavior, above baseline levels, for a period of two weeks or more beyond the withdrawal of contrived intervention contingencies. Boyce and

Geller (2001) suggest visual inspection of time-series data to detect levels of behavior “above baseline” and/or investigation of statistical significance.

The occurrence of VT student safety-belt did increase from the pre-intervention level (80%) to the intervention level (81%). Also, the post-intervention phase percentage (85%) was higher than the pre-intervention and intervention phase percentages, while the percentage decreased to 82% during the follow-up phase. Visual inspection of these data, alone, might suggest that the intervention effect was maintained. However, the author doubts that this effect was due to the intervention at all because comparative visual inspection of VT student belt-use and belt-use among VT faculty/staff shows seeming maintenance among both groups. Again, the author concludes that the changes in VT student safety-belt use phase percentages must not be attributable to the Buckle-Up Hokies intervention. Therefore, these apparent maintenance effects must not be valid.

Awareness and social norm change as ancillary outcomes. Although there is no evidence for behavior maintenance of safety-belt use following the Buckle-Up Hokies intervention, awareness and social norm change may have been ancillary outcomes. If, in fact, The A.R.K. Project raised awareness and fortified social norms regarding safety-belt use as a community responsibility, this would be a positive outcome. Although this study did not directly measure cognitive processes that may be related to behavior change, it has been suggested that cognitive components of behavioral acquisition and follow-up are likely quite important. A study by Jones, Ollendick, and Shinske (1989) found elaborative-behavioral training lead to optimal fire emergency skill and knowledge acquisition, suggesting the importance of elaborative cognitive processes in behavior and knowledge change.

According to a study on the effects of self-instruction on maintaining newly acquired fire emergency response behaviors, cognitive self-instruction was found to be superior to external instruction (Jones & Haney, 1984). This suggests that self-instructional behaviors such as self-verbalization, self-monitoring, self-evaluation, and self-reinforcement are required for behavioral maintenance.

The A.R.K. Project intervention delivered educational information, behavioral prompting, and behavioral commitment opportunities to the target community. Also, while the researchers did not measure attitudes and other cognitive processes directly, the intervention aimed to make both the negative outcomes of non-use of belts and the positive outcomes of community participation in a safety-belt use promotion project salient to the target community. Perhaps people sincerely realized they were more at-risk for negative outcomes when not wearing a safety belt. This may have led to elaborative cognitive processes and social learning.

Responses from one item on the web-based survey may be informative, assuming respondents did not arbitrarily answer this item. The self-reported web-survey results suggest that the target audience, students, consider safety-belt use promotion to be a community responsibility. An overarching vision of The A.R.K. Project was to reinforce the need for community action in safety-belt use promotion in place of punitive approaches.

Institutionalization and extension. Altman (1995) suggested institutionalization and maintenance must be considered during program intervention design, implementation, and evaluation. Boyce and Geller (2001) suggested that institutionalization occurs when program-related contingencies are carried on by the community after researchers have left the setting. Only empirically supported products should be institutionalized and extended.

Unfortunately, the nature of the academic-community partnership surrounding The A.R.K. Project fostered premature commitment and involvement on behalf of academic and community partners prior to the author's determination that the project was not empirically supported. Therefore, the author is committed to dispelling this confidence in the intervention in future correspondence with academic audiences, community stakeholders, and traffic agencies. Additionally, the author will communicate the success of the Buckle-Up Flashcards intervention to academic audiences, community stakeholders, and traffic agencies. The current 20% of drivers who do not buckle-up can be influenced by a low-cost, efficient, peer-delivered, inter-personal prompt.

The author collaborated with others to produce and submit a manuscript about the successful Buckle-Up Flashcard component and this has been submitted to a scholarly journal for publication. Further evaluation of this positive and friendly way to promote safety-belt use is currently underway in CABS where the Buckle-Up Flashcard prompting technique is being compared to the popular enforcement approach promoted by the U.S. government (i.e., Click-it-or-Ticket).

Limitations and lessons learned. The limited exposure of the intervention to the un-buckled sub-group of the target community was one major limitation of The A.R.K. Project. The author hypothesizes the current disappointing results may reflect the limited exposure of the intervention to un-buckled VT student drivers. The Buckle-Up Hokies week intervention did not reach a large enough proportion of the un-buckled student population as it could have had more emphasis been placed on the low-cost and efficient Buckle-Up Flashcards component.

The most costly and inefficient intervention components were the most difficult to implement by undergraduate community volunteers. This required strict adherence to multiple

protocols, leaving room for threats to internal validity. It was very challenging for the author to manage The A.R.K. Project leaders and the people from their organizations. Because protocols were carefully designed, any shift in protocol was potentially problematic. While the author educated the volunteers about this, it was exceedingly difficult to manage the process, and it required an enormous amount of oversight by the author and the CABS center coordinators. Efforts to instill a higher level of accountability among volunteers would be useful in future grassroots projects and/or hired staff could be secured and, presumably, be held accountable for their adherence to future protocols.

Attempts to instill a sense of ownership into the community leaders were not necessarily related to behavioral manifestations of conscientiousness. For example, the author created elected project leaders' roles (i.e., leader of community relations, leader of fundraising, treasurer, and group leaders- representing CABS, Sig Ep, and DZ), to encourage accountability to roles but they did not adhere to their respective roles. Instead, they loosely adhered to the roles.

In retrospect, the amount of money and time poured into the Buckle-Up Hokies Week could have been minimized had the author chosen to narrow the intervention's focus to the unbuckled sub-group of the VT student population. The results of the Buckle-Up Flashcard intervention component point to the utility of this low-cost, efficient, intrusive, and inter-personal intervention to produce significant safety-belt use change among unbuckled drivers.

Future directions for research. In the current culture, safety-belt use is a normative behavior. The author suggests that future intervention efforts to increase safety-belt use within this culture, refer to Geller, et. al.'s (1990) framework which suggests the necessity and utility of low-cost, efficient, intrusive, and inter-personal interventions to target the last 20% of unbuckled drivers.

Future interventions should avoid the use of expensive, inefficient, un-intrusive components which did not appropriately target un-buckled drivers. The Buckle-Up Flashcards component was empirically supported and future research should continue to investigate this component's utility and effectiveness in segmented target populations.

As Winett, Moore, and Anderson (1991) suggest, behavior-change interventions should be directed towards problems of verifiable importance. Verifiable importance should be defined epidemiologically. Verifiable importance is relative to relation of a target behavior to preventable morbidity and mortality. Although, consensus has been reached regarding the verifiable importance of safety-belt use, some researchers and policy-makers assume that safety-belt use has reached a ceiling. The current author encourages future researchers to believe in the importance of safety-belt use promotion while designing, implementing, and evaluating interventions which target the last 20% of drivers who do not regularly buckle-up. Understanding the characteristics that define those who do not buckle-up, and who do not follow other safe driving behaviors (i.e., turn-signal use and cell-phone use) is critical to inform the design, implementation, and evaluation of grassroots interventions to this verifiably important problem.

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Figure 1. Daily percentages of safety-belt use among the target community (VT students) and controls (VT faculty/staff and RU students).

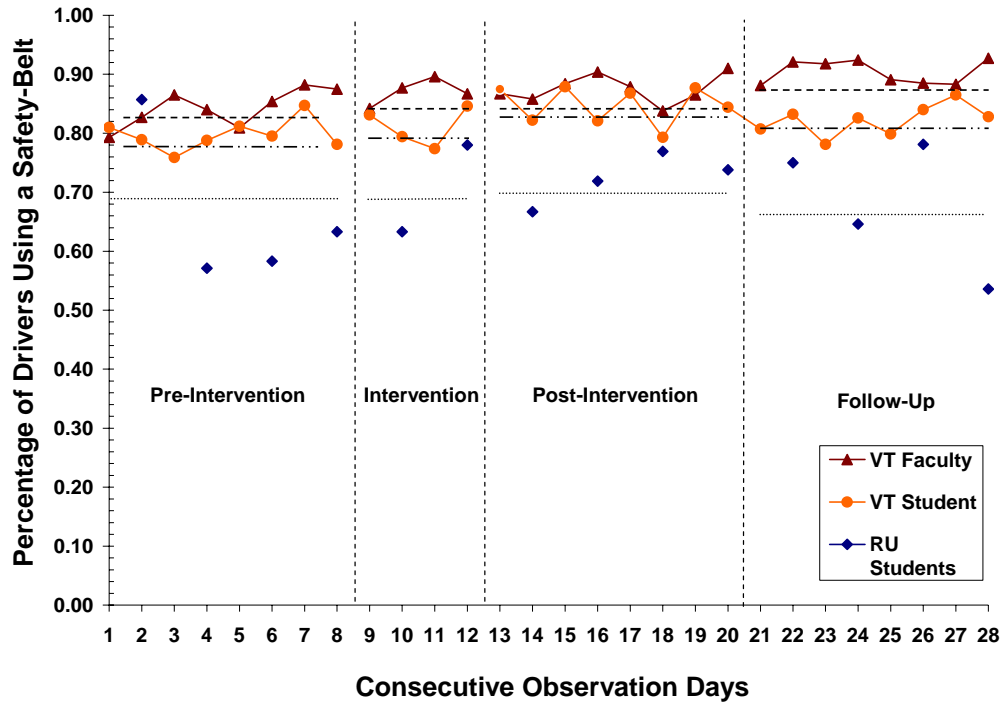


Figure 2. Daily percentages of safety-belt use among males and females (faculty/staff and students combined).

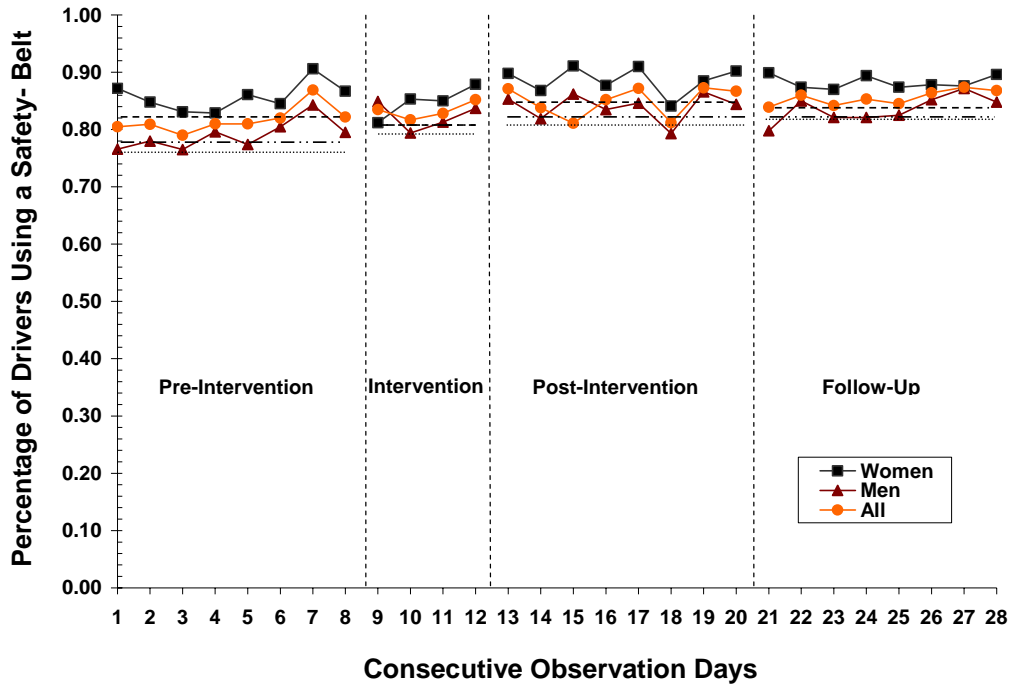


Figure 3. Daily percentages of cell-phone use among the target community (VT students) and controls (VT faculty/staff and RU students).

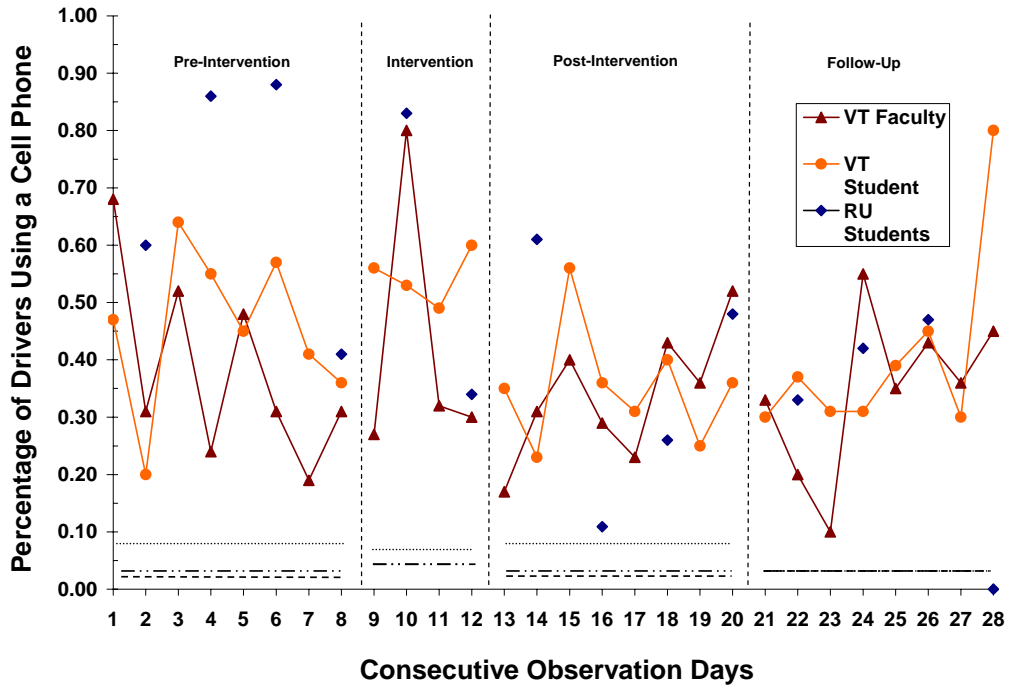


Figure 4. Percent safety-belt use and cell-phone use among data in aggregate.

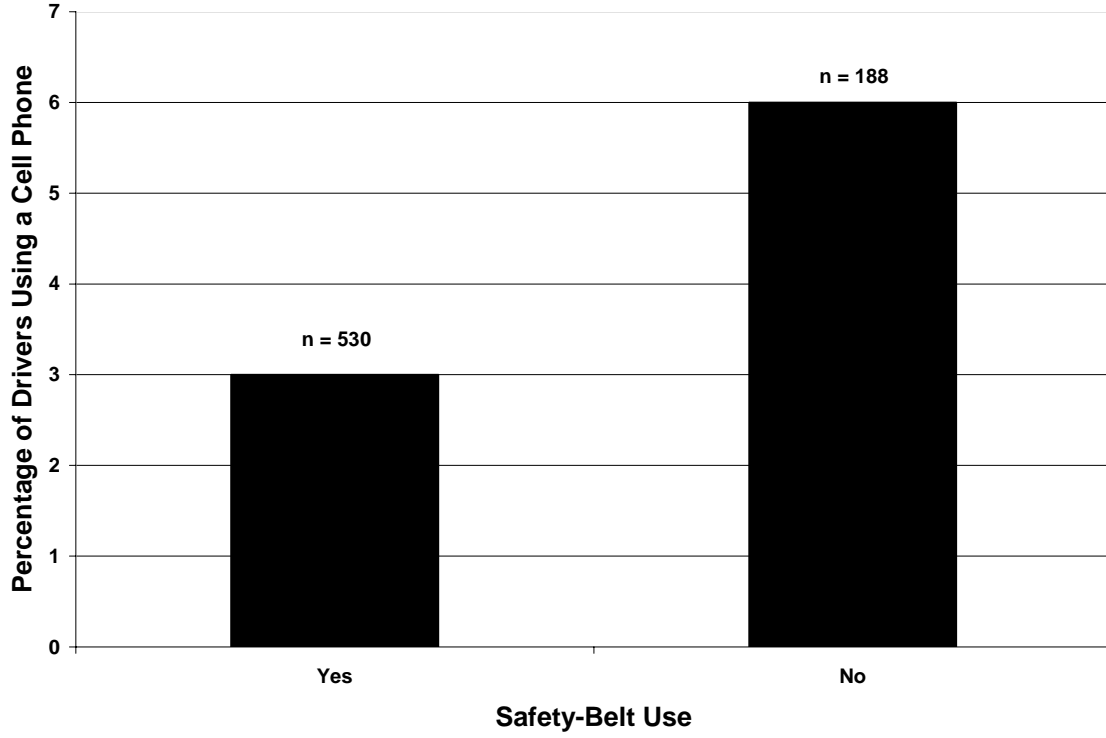


Figure 5. Daily percentages of turn-signal use among the target community (VT students) and controls (VT faculty/staff and RU students).

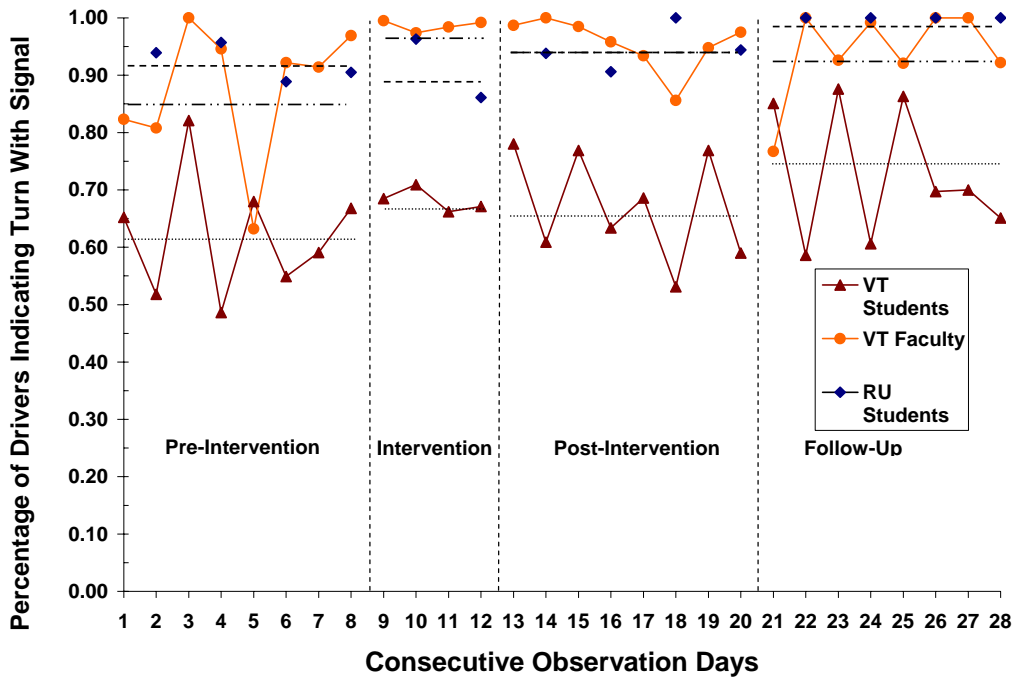


Figure 6. Percent safety-belt use and turn-signal use among data in aggregate.

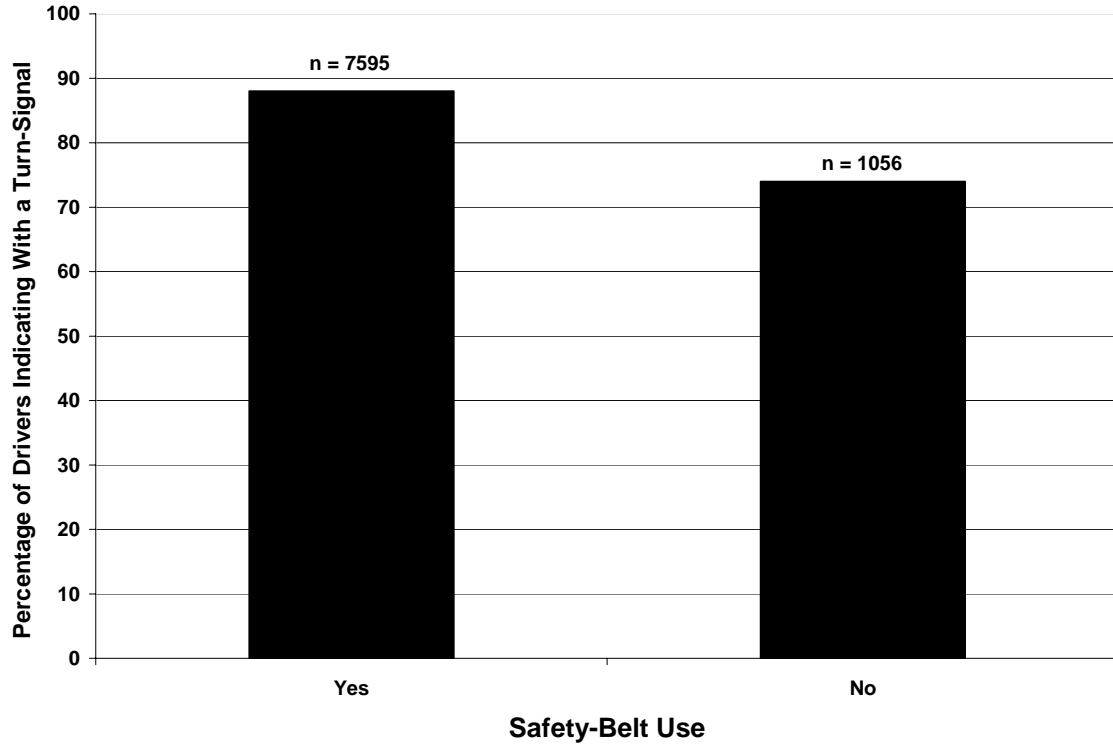
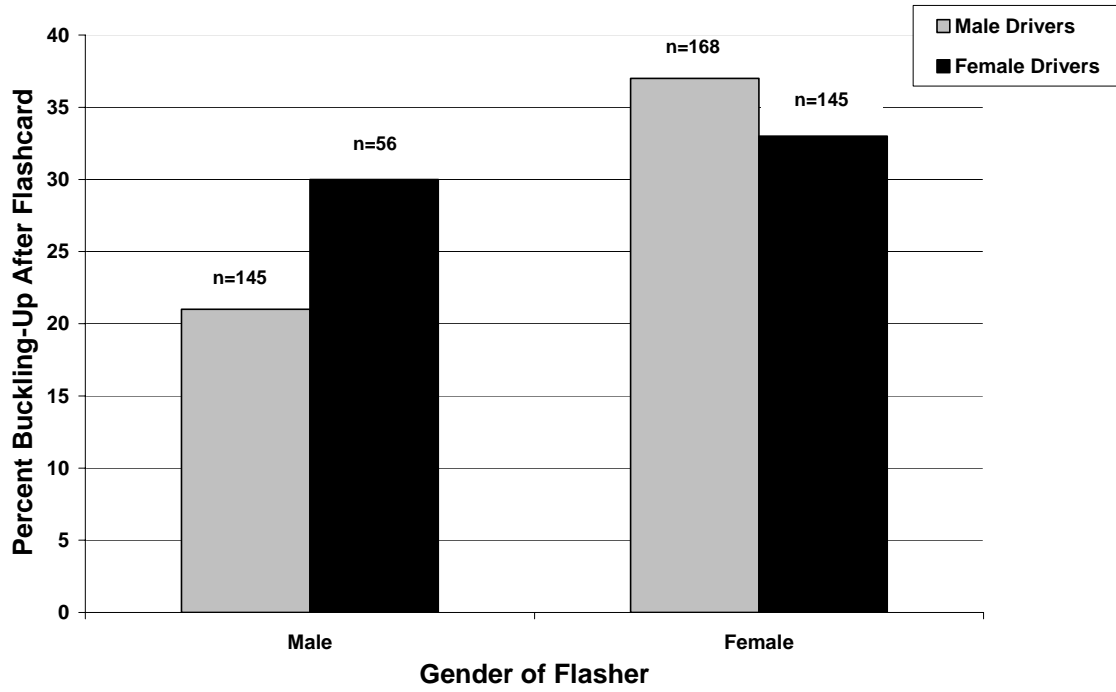


Figure 7. Percent compliance with flashcard intervention as a function of gender.



Appendix A: Pilot Study

Pledge Card and Pledge Process: Photo

Wristband

Static Sticker

Buckle-Up Flashcard: Front and Back View

Buckle-Up Flashcard Protocol

Buckle-Up Flashcard Data Collection Sheet

VT Field Observation Data Collection Protocol

VT Field Observation Data Collection Sheet

Map: VT Field Observation Sites

Press Coverage: Sample

Pledge Card and Pledge Process: Photo

I promise to buckle up
&
ask others to do the same

"THE A.R.K. PROJECT"

Always Remember to Klick-it

Name _____
Phone _____
E-mail _____

Prizes donated by local merchants




Wristband



Static Sticker

Buckle-Up!
In memory of



*Ashley Ryan Krueger
and for those we love*

"THE A.R.K. PROJECT"
Sponsored by Center for Applied Behavior Systems,
Delta Zeta, and Sigma Phi Epsilon

Buckle-Up Flashcard: Front and Back View

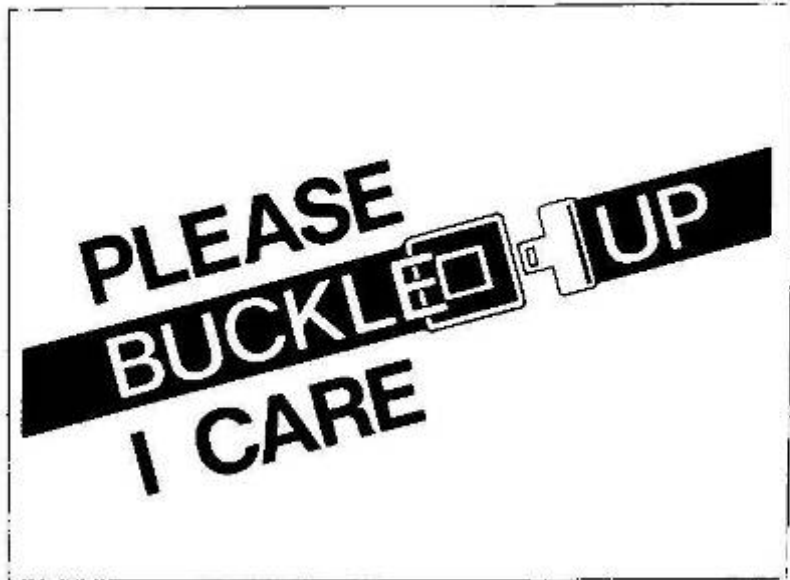


Fig. 10. The front and back of the 11" x 14" "Flash for Life" card, which is brightly colored in yellow, black, and white. Reproduced by permission from Thyer, B.A., Geller, E.S., Williams, M., and Purcell, E.: Community-based "flashing" to increase safety belt use. *J. Exp. Educ.*, 55, 156, 1987.



Fig. 11. Back of the "Flash for Life" card.

Buckle-Up Flashcard Protocol

Buckle-Up Flashcard Protocol

Person 1: Hold flash card

Identify oncoming car w/ driver Un-buckled:

Flash sign “Please buckle up...”

Do they buckle after you flash?

Yes: *Flash sign* “Thank you for buckling...”

Person 2: Hold 2 counters- one in each hand

Handcounter 1: Count # of Un-buckled drivers who are flashed “Please buckle up...”

Handcounter 2: Count # of these drivers who buckle up after they were flashed.

Buckle-Up Flashcard Data Collection Sheet

**The A.R.K Project
Buckle-Up Flashcard Daily Flash Report**

TODAY'S DATE:

Time Slot	Clicker #11	Clicker #15
	# of Un-buckled drivers flashed	(# of those un-buckled drivers flashed who buckle up following flash)
11a to 12p		
12p-1p		
1p-2p		
2p-3p		
3p-4p		
4p-5p*		

CLEAR YOUR KLICKERS EACH HOUR

*The last flashers of the day are responsible for returning the clickers and flash cards to the CABS office (202 Williams Hall)

VT Field Observation Data Collection Protocol

Ashley Krueger Safety Belt Study Data Collection Protocol

Thank you for taking the time to collect data for this project. The importance of the data you are collecting cannot be underestimated. Please follow the instructions below carefully. Your honesty and best efforts while collecting data are truly appreciated.

Please provide the following information at the top of the data sheet:

1. **Date:** Indicate today's date
 2. **Time:** Circle 12:00-1:00PM or 4:00-5:00PM to indicate whether you are collecting data during the afternoon or evening shift
 3. **Data Collector 1:** Write the name of the person who will choose the vehicle to observe (e.g., "Observation # 7 is that red Ford Explorer").
Data Collector 2: Write the name of the person who will collect data on the *same vehicle which data collector 1 chooses- do not discuss your observations.*
- CIRCLE YOUR NAME**
4. **Location:** Circle the location you are collecting data from. We are collecting data from six locations: a) In front of McComas Hall – intersection of W. Campus and Washington (i.e., McCom); b) Drillfield Drive in front of Burrell Hall (i.e., Drill); c) Intersection of W. Campus Drive & Prices Fork (i.e., W. Camp & P. Fork); d) Intersection of Washington St. & Kent St.– 4-way stop (i.e., Wash. & Kent); e) Intersection of Draper Rd & College Ave. (i.e., Drap. & Coll.); and f) Oak Lane & Duck Pond Dr. (i.e., Oak).
 5. **Weather:** Circle all weather conditions that apply (i.e., Dry, Rain, Snow/Ice, and/or Fog).

Each vehicle you identify for data collection represents a row on the data sheet. Please use the following criteria when collecting data. If you miss something – just leave it blank (please don't guess). Please just try to be as accurate as possible.

1. **Gender:** Indicate the gender of the driver by circling "M" for male or "F" for female.
2. **Vehicle:** Circle "C" for a car, "T" for a pickup truck or a large commercial delivery vehicle, or "S" for an SUV or minivan.
3. **Permit:** Circle "F/S" for a faculty/staff parking permit, "S" for either student (commuter, resident or graduate permit), or "ø" if there is no permit.
4. **Belt:** Indicate whether the DRIVER is wearing his/her safety belt by circling "Y" for yes or "N" for no.
5. **Pass. Belt:** If applicable, indicate whether the person in the passenger seat is wearing his/her safety belt. Circle "Y" for yes, "N" for no, or "ø" if nobody is in the passenger seat.
6. **Signal:** If the vehicle is making a turn, indicate if the turn signal is used. Circle "Y" for yes, "N" for no, or "ø" if the driver is not making a turn..
7. **Stop Signal:** If the vehicle encounters a red light or stop sign, indicate if it comes to a complete stop (i.e., all wheels stop for at least 3 seconds) before proceeding straight, left, or right. . Circle "Y" for yes, "N" for no, or "ø" if the vehicle does not encounter a red light or stop sign.
8. **Pedestrian:** If a pedestrian attempts to cross the road, indicate whether the vehicle stops to let them cross. Circle "Y" for yes, "N" for no, or "ø" if no pedestrian attempts to cross the road

THANK YOU!

Please contact lvf2101@vt.edu or call 540-231-8145 if you have any questions

VT Field Observation Data Collection Sheet

Ashley Krueger Safety Belt Study -- Fall 2004

Date: _____

Location: McCom Drill W. Camp & P. Fork
Wash. & Kent Drap. & Coll. Oak

Time: 12:00-1:00PM 4:00-5:00 PM

Weather: Dry Rain Snow/Ice Fog

Data Collector 1 Name (chooses vehicle): _____

Collector 2 Name: _____

Circle YOUR Name

	Gender	Vehicle	Permit	Belt	Pass. Belt	Signal	StopSignal	Pedestrian
1	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
2	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
3	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
4	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
5	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
6	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
7	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
8	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
9	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
10	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
11	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
12	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
13	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
14	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
15	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
16	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
17	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
18	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
19	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
20	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
21	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
22	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
23	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
24	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
25	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
26	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
27	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
28	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
29	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
30	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
31	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
32	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
33	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
34	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø
35	M F	C T S	F/S S Ø	Y N	Y N Ø	Y N Ø	Y N Ø	Y N Ø

Notes:

Entered: _____

Verified: _____

Appendix B: Study

Educational Outreach Locations and Photos

Wrecked Vehicle on the Drillfield with Vince and Larry: Photos

Pledge Card and Pledge Card Process: Photo

Wristband

Static Sticker

Buckle-Up Flashcard: Front and Back View

Logo and Slogan

Press Release

Print Advertisement

Print Advertisement

Buckle-Up Flashcard Data Collection Protocol

Buckle-Up Flashcard Data Collection Sheet

VT Field Observation Data Collection Protocol

VT Field Observation Data Collection Sheet

RU Field Observation Data Collection Protocol

RU Field Observation Data Collection Sheet

Map: VT Field Observation Sites

Map: RU Field Observation Sites

Appendix B: Study (cont.)

Web-Based Survey Email Description

Web-Based Survey

Secret Shoppers Manipulation Check Protocol

Secret Shoppers Manipulation Check Data Sheet

Description of Leader Positions

Weekly Planning Meeting with The A.R.K. Project Leaders: Photo

Educational Outreach Locations and Photos

1. McBryde (outside)
2. The Drillfield
3. Squires (outside on 'front porch')
4. Dietrich Dining Center
5. West End Dining Center



Wrecked Vehicle on the Drillfield with Vince and Larry: Photos



Pledge Card and Pledge Card Process: Photo

I promise to buckle up
&
ask others to do the same

"THE A.R.K. PROJECT"

Always Remember to Klick-it

Name _____

Phone _____

E-mail _____

Prizes donated by local merchants



Wristband



Static Sticker

Buckle-Up!

In memory of



*Ashley Ryan Krueger
and for those we love*

"THE A.R.K. PROJECT"

Sponsored by Center for Applied Behavior Systems,
Delta Zeta, and Sigma Phi Epsilon

Buckle-Up Flashcard: Front and Back View

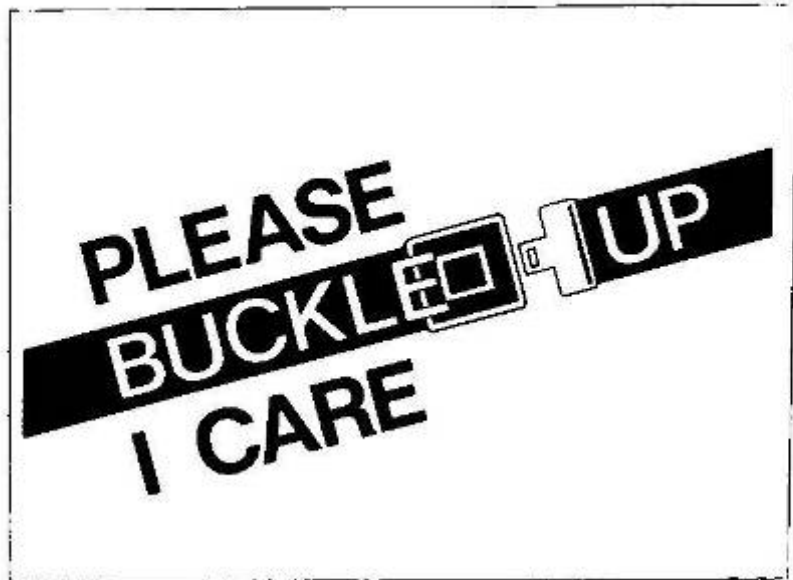


Fig. 10. The front and back of the 11" x 14" "Flash for Life" card, which is brightly colored in yellow, black, and white. Reproduced by permission from Thyer, B.A., Geller, E.S., Williams, M., and Purcell, E.: Community based "bashing" to increase safety belt use. *J. Exp. Educ.*, 55:156, 1987.



161-24-86-7-Cardstock-October 1988

Logo and Slogan



A.lways R.emember to K.lick It

Press Release

THE A.R.K. PROJECT
A.lways R.emember to K.lick it
“BUCKLE-UP HOKIES”
APRIL 11TH -15TH

The A.R.K. Project is taking over VT 's campus in its annual “Buckle-Up Hokies” April 11th- 15th. Currently safety belt use on VT 's campus is at 77%, which is less than the national average of 80%. The goal of the A.R.K. Project's “Buckle-Up Hokies” is to increase safety belt use in the VT community beyond 80%. If the project is a success, the A.R.K. project can be disseminated to other universities across the country as a tailored package. Project members are pushing safety belt awareness through the use of “Buckle-Up” signs, information booths, A.R.K. t-shirts, and more, in order to increase safety belt use.

The A.R.K. Project is named after Ashley Ryan Krueger, a beloved sister of Delta Zeta Sorority and a Goldenheart of Sigma Phi Epsilon Fraternity. On May 4, 2003, Ashley died as a result of a car crash after being thrown from the vehicle. Delta Zeta, Sigma Phi Epsilon and the Center for Applied Behavior Systems formed the A.R.K. Project soon after her death. They wanted to remind others the importance of safety belt use and to challenge the community to make a conscious effort to buckle up. A safety belt could have saved Ashley's life and it can save other lives as well.

Be sure to look for the A.R.K Project during “Buckle-Up Hokies.” Pledge cards can be signed at any of the A.R.K. Project booths to help increase safety belt use at VT. Also, “Buckle-Up For Someone You Love” maroon A.R.K. bracelets and “Buckle-Up” car stickers with Ashley's picture on it are being sold at the booths. The A.R.K. Project is sponsoring “ASH FEST” at 9pm on Wednesday April 13th at Top of the Stairs. Come check out Rude Budda and all of the other bands! Donations will go towards the Ashley Ryan Krueger Memorial Scholarship Fund.

If you have any questions regarding The A.R.K. Project you can contact: Michelle Cullum Community Relations mcullum@vt.edu



A.lways R.emember to K.lick It

- Bracelets
- 'Buckle-Up' Stickers

AND- **ASHFest-Live Bands**

IT'S BUCKLE-UP HOKIES WEEK!!!

Brought you by The A.R.K. Project

*Swing by an
A.R.K. Project booth for:-*

- 'Buckle-Up' Pledging
- 'Buckle-Up'

VT Safety Belt Use
BELOW National
Average!

**Every year more kids our age die in vehicle crashes than from any
other cause.**

Safety-belt use is a community responsibility.

A.lways R.emember to K.lick It & Ask Others to Do the Same!

The A.R.K. Project is named in loving memory of our friend...

Ashley Ryan Krueger (A.R.K.).

Top of the Stairs
Weds, 4/13, 9p...
All Ages (\$5+
donations)

Print Advertisement

**Come out to
AshFest 2005!!!!**

In Memory of Ashley Ryan Krueger
and in celebration of "Buckle-Up Hokies" Week

TOTS* Wed. April 13th

\$5 at the door...donations welcome

*All are welcome 18 and up

Featuring Rude Buddha.....

(Donations go towards the Ashley Ryan Krueger Memorial Scholarship Fund)

Buckle Up Flashcard Data Collection Protocol

- 1) Enter **CABS data collection #s for both flasher and clicker**
 - 2) Circle **Time**: 11:00am-12:00pm OR 1:00pm-2:00pm OR 3:00pm-4:00pm
 - 3) Circle the location you are collecting data from. We are collecting data from 4 locations:
 - a) Derring Parking Lot A OR B and b) the Prices Fork Parking Lot A OR B
-

Protocol

Person 1 (flasher): Hold flash card

- 1) Identify oncoming car
- 2) Determine, is the driver buckled or Un-buckled?
- 3) If the driver is buckled, flash “Thank you for buckling...”
BUT...
If the driver is Un-buckled:

Flash sign “Please buckle up...”

Do they buckle after you flash?

Yes: *Flash sign* “Thank you for buckling...”

Person 2 (clicker): Hold 2 counters- one in each hand

Handcounter (clicker) 1: Count # of Un-buckled drivers who are flashed “Please buckle...”

Handcounter (clicker) 2: Count # of these drivers who buckle up after they were flashed.

Buckle Up Flashcard Data Collection Sheet

Data Collector #s (flasher & clicker):

Date: _____

Location (Circle One):

Prices Fork Parking Lot A

Prices Fork Parking Lot B

Derring Parking Lot A

Derring Parking Lot B

Time:

11:00am-12:00pm

1:00pm-2:00pm

3:00pm-4:00pm

ATTEMPTS

SUCCESSSES

VT Field Observations Data Collection Protocol

The A.R.K. Project: Spring 2005 Main Field Observations Data Collection Protocol

Thank you for taking the time to collect data for this project. The importance of the data you are collecting cannot be underestimated. Please follow the instructions below carefully. Your honesty and best efforts while collecting data are truly appreciated.

Please provide the following information at the top of the data sheet:

Date: Indicate today's date

Location: Circle location

Time: Circle time (8:00am to 9:00am OR 9:30am to 10:30am OR 12pm-1pm OR 4:30pm-5:30pm)

Primary Data Collector #: Enter your CABS data collector #.

Reliability Data Collector #: Enter your CABS data collector #.

When collecting reliability data, the Primary Data Collector will choose the vehicle to observe (e.g., "Observation # 7 is that red Ford Explorer"). Do not discuss your observations.

1. **Location:** Circle the location you are collecting data from. We are collecting data from 4 locations: a) Derring Parking Lot A OR Derring Parking Lot B and b) Prices Fork Parking Lot A OR Prices Fork Parking Lot B

Each vehicle you identify for data collection represents a row on the data sheet. Please use the following criteria when collecting data. If you miss something – just leave it blank (please don't guess). Please just try to be as accurate as possible.

2. **Gender:** Indicate the gender of the driver by circling "M" for male or "F" for female.

Do not observe commercial vehicles

3. **Belt:** Indicate whether the DRIVER is wearing his/her safety belt by circling "Y" for yes or "N" for no.
4. **Signal:** If the vehicle is making a turn, indicate if the turn signal is used. Circle "Y" for yes, "N" for no, or "o" if the driver is not making a turn..
5. **Cell Phone:** If the driver is using a cell phone circle "Y" for yes, "N" for no

THANK YOU!

Please contact macox@vt.edu or call 540-231-8145 if you have any questions

VT Field Observations Data Collection Sheet

The A.R.K. Project: Spring 2005
 MAIN FIELD OBSERVATIONS DATA SHEET

Date: _____

Location: Derring Parking Lot A Derring Parking Lot B Prices Fork Parking Lot A Prices Fork Parking Lot B

Time: 8:00am-9:00am 9:30am-10:30am 12:00pm-1:00pm 4:30pm-5:30pm

Primary Data Collector #: _____

Reliability Data Collector #: _____

	Gender	Belt	Signal	Cell Phone
1	M F	Y N	Y N Ø	Y N
2	M F	Y N	Y N Ø	Y N
3	M F	Y N	Y N Ø	Y N
4	M F	Y N	Y N Ø	Y N
5	M F	Y N	Y N Ø	Y N
6	M F	Y N	Y N Ø	Y N
7	M F	Y N	Y N Ø	Y N
8	M F	Y N	Y N Ø	Y N
9	M F	Y N	Y N Ø	Y N
10	M F	Y N	Y N Ø	Y N
11	M F	Y N	Y N Ø	Y N
12	M F	Y N	Y N Ø	Y N
13	M F	Y N	Y N Ø	Y N
14	M F	Y N	Y N Ø	Y N
15	M F	Y N	Y N Ø	Y N
16	M F	Y N	Y N Ø	Y N
17	M F	Y N	Y N Ø	Y N
18	M F	Y N	Y N Ø	Y N
19	M F	Y N	Y N Ø	Y N
20	M F	Y N	Y N Ø	Y N
21	M F	Y N	Y N Ø	Y N
22	M F	Y N	Y N Ø	Y N
23	M F	Y N	Y N Ø	Y N
24	M F	Y N	Y N Ø	Y N
25	M F	Y N	Y N Ø	Y N
26	M F	Y N	Y N Ø	Y N
27	M F	Y N	Y N Ø	Y N
28	M F	Y N	Y N Ø	Y N
29	M F	Y N	Y N Ø	Y N
30	M F	Y N	Y N Ø	Y N
31	M F	Y N	Y N Ø	Y N
32	M F	Y N	Y N Ø	Y N
33	M F	Y N	Y N Ø	Y N
34	M F	Y N	Y N Ø	Y N
35	M F	Y N	Y N Ø	Y N

Entered: _____

Notes:

Verified: _____

RU Field Observation Data Collection Protocol

The A.R.K. Project: Spring 2005
RU Field Observations Data Collection Protocol

Thank you for taking the time to collect data for this project. The importance of the data you are collecting cannot be underestimated. Please follow the instructions below carefully. Your honesty and best efforts while collecting data are truly appreciated.

Please provide the following information at the top of the data sheet:

Date: Indicate today's date

Location: Circle location

Primary Data Collector #: Enter your CABS data collector #.

Reliability Data Collector #: Enter your CABS data collector #.

When collecting reliability data, the Primary Data Collector will choose the vehicle to observe (e.g., "Observation # 7 is that red Ford Explorer"). Do not discuss your observations.

1. **Location:** Circle the location you are collecting data from. We are collecting data from 2 locations: a) Parking Lot C, site A OR Parking Lot C, site B

Each vehicle you identify for data collection represents a row on the data sheet. Please use the following criteria when collecting data. If you miss something – just leave it blank (please don't guess). Please just try to be as accurate as possible.

2. **Gender:** Indicate the gender of the driver by circling "M" for male or "F" for female.

Do not observe commercial vehicles

3. **Belt:** Indicate whether the DRIVER is wearing his/her safety belt by circling "Y" for yes or "N" for no.
4. **Signal:** If the vehicle is making a turn, indicate if the turn signal is used. Circle "Y" for yes, "N" for no, or "Ø" if the driver is not making a turn..
5. **Cell Phone:** If the driver is using a cell phone circle "Y" for yes, "N" for no

THANK YOU!

Please contact macox@vt.edu or call 540-231-8145 if you have any questions

RU Field Observations Data Collection Sheet

The A.R.K. Project: Spring 2005
RADFORD FIELD OBSERVATIONS DATA SHEET

Date: _____

Location: Parking Lot C, site A

Parking Lot C, site B

Primary Data Collector #: _____

Reliability Data Collector #: _____

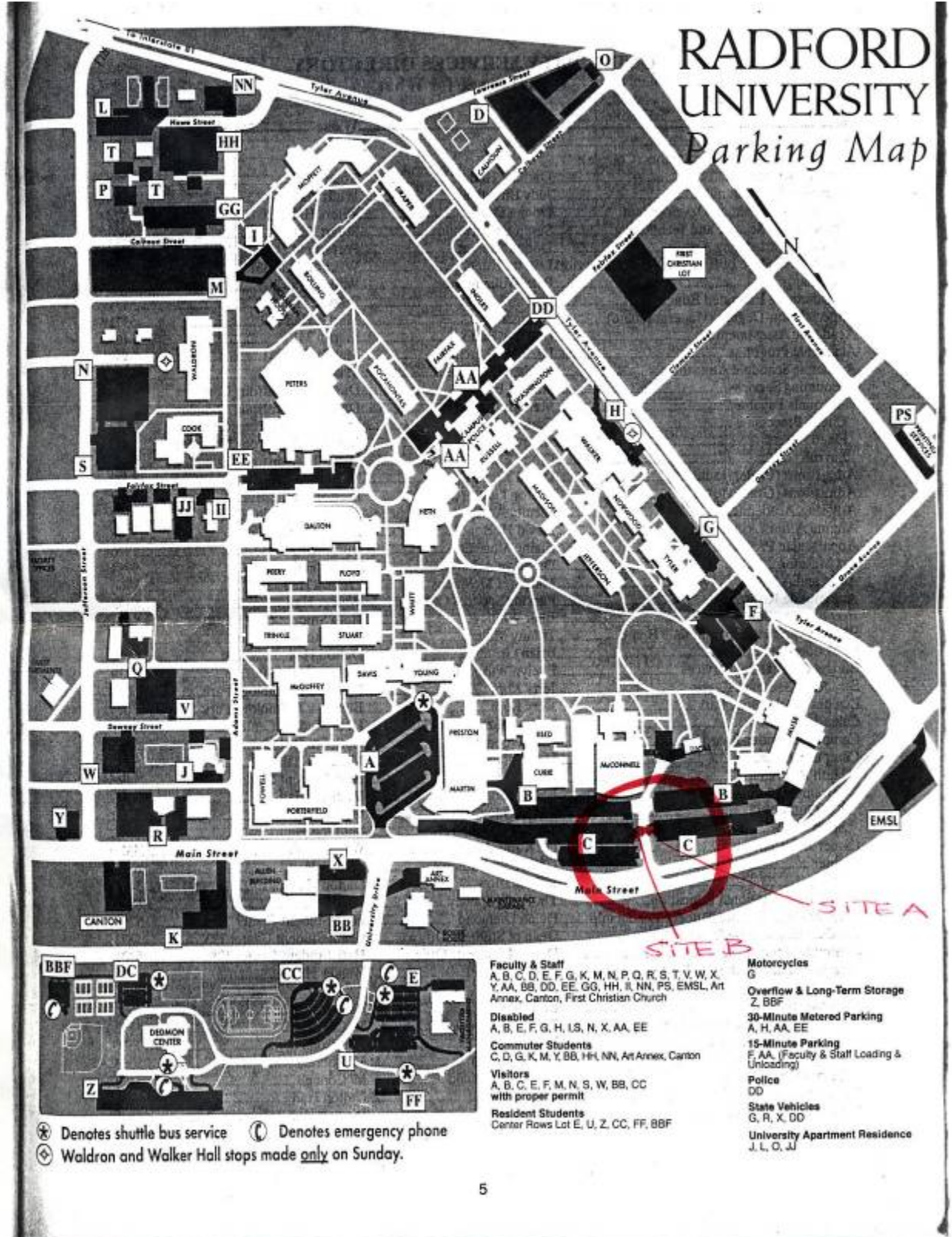
	Gender	Belt	Signal	Cell Phone
1	M F	Y N	Y N Ø	Y N
2	M F	Y N	Y N Ø	Y N
3	M F	Y N	Y N Ø	Y N
4	M F	Y N	Y N Ø	Y N
5	M F	Y N	Y N Ø	Y N
6	M F	Y N	Y N Ø	Y N
7	M F	Y N	Y N Ø	Y N
8	M F	Y N	Y N Ø	Y N
9	M F	Y N	Y N Ø	Y N
10	M F	Y N	Y N Ø	Y N
11	M F	Y N	Y N Ø	Y N
12	M F	Y N	Y N Ø	Y N
13	M F	Y N	Y N Ø	Y N
14	M F	Y N	Y N Ø	Y N
15	M F	Y N	Y N Ø	Y N
16	M F	Y N	Y N Ø	Y N
17	M F	Y N	Y N Ø	Y N
18	M F	Y N	Y N Ø	Y N
19	M F	Y N	Y N Ø	Y N
20	M F	Y N	Y N Ø	Y N
21	M F	Y N	Y N Ø	Y N
22	M F	Y N	Y N Ø	Y N
23	M F	Y N	Y N Ø	Y N
24	M F	Y N	Y N Ø	Y N
25	M F	Y N	Y N Ø	Y N
26	M F	Y N	Y N Ø	Y N
27	M F	Y N	Y N Ø	Y N
28	M F	Y N	Y N Ø	Y N
29	M F	Y N	Y N Ø	Y N
30	M F	Y N	Y N Ø	Y N
31	M F	Y N	Y N Ø	Y N
32	M F	Y N	Y N Ø	Y N
33	M F	Y N	Y N Ø	Y N
34	M F	Y N	Y N Ø	Y N
35	M F	Y N	Y N Ø	Y N

Entered: _____

Notes:

Verified: _____

Map: RU Field Observation Sites



Web-Based Survey Email Description

Email Subject:

<Do you know about The A.R.K. Project?>

Email Text:

<Recently, a grassroots, student-led effort to increase student safety-belt use was in effect on the VT campus. We used a number of strategies in attempt to increase belt use.

As part of our evaluation process, we would like to know if you saw The A.R.K. Project in action.

Please take a moment to answer a few short questions about this by clicking on the link below. Thank you very much for your participation and A.lways R.emember to K.lick it.>

<**Insert link to web-survey**>

The A.R.K. Project was created in memory of Ashley Ryan Krueger, a VT student who died following a car crash when she was not using her safety belt.

Any questions or concerns may be directed to Leah Farrell (lvf2101@vt.edu).

Web-Based Survey

- 1) Are you a faculty member or a staff member?
- 2) Are you a student?
- 3) Answer True or False: Using my safety belt and asking others to do the same is a community responsibility.
- 4) Do you regularly use your safety belt when driving a vehicle?
- 5) Have you heard of The A.R.K. Project?
- 6) If yes, would you say that your safety belt use has increased as a result of The A.R.K. Project?
- 7) Have you seen the red 'Live Strong' style wristbands on the VT campus that say, "Buckle-Up for Someone You Love?"
- 8) Do you own one of these red wristbands?
- 9) Have you seen the vehicle static stickers with the photo of Ashley Ryan Krueger on them that say "Buckle-Up for Someone You Love?"
- 10) Do you own one of these static stickers?
- 11) Did you pledge, recently, to use your safety belt this year on the VT campus?
- 12) Were you aware of the opportunity to pledge?
- 13) Lately, have you seen any people- sitting at tables promoting safety belt use on the VT campus?
- 14) If yes, did you make contact with any of them (stop to look/talk/etc.)?
- 15) Did you see the wrecked car on the VT Drillfield recently?
- 16) Did you encounter the people in campus parking lots with the "Buckle-Up" signs recently?

Secret Shoppers Manipulation Check Protocol

You will approach all 5 A.R.K. Project table locations during your hour of 'secret shopping'. Your mission is to check to see if the manipulation (intervention) is being performed according to protocol. The order in which you visit each table is up to you.

5 Table Locations (see map):

- 1 McBryde (outside)
- 2 The Drillfield
- 3 Squires (outside on 'front porch')
- 4 Dietrich Dining Center
- 5 West End Dining Center

FOLLOW THIS PROTOCOL for each table visit:

- 1) Approach table
- 2) Ask what The A.R. K. Project is
- 3) Ask how you can buy a bag
- 4) Ask if you can buy more than one bag.
- 5) Go through process of pledging* and buying a bag

When you sign the pledge card Write SS in large letters to the right of your name so we can identify the secret shoppers' pledge stubs (so we do not count them)

- 6) AFTER you walk away from the booth, complete the data sheet:

RETURN YOUR DATA SHEET TO CABS RIGHT AFTER YOUR SHIFT!

Secret Shoppers Manipulation Check Data Sheet

Data Collector # _____

Date: _____

Time: _____

Weather: circle one: rain / sunny / cloudy

Table Location # _____

- 1) Did the attendant/s explain The A.R. K. Project in terms that you could understand, if you knew nothing about it?
Yes_____ No_____
- 2) Did the attendant/s explain that you must first pledge before you were eligible to buy a bag?
Yes_____ No_____
- 3) Did the attendant/s tell you that you could only buy one bag?
Yes_____ No_____
- 4) Did you pledge and buy a bag?
Yes_____ No_____
- 5) Was your overall impression of your interaction with the attendant/s positive?
Yes_____ No_____
- 6) Was there a line at the table when you approached it?
Yes_____ No_____
- 7) Were the attendants actively recruiting passers-by to visit the booth?
Yes_____ No_____
- If 'Yes' how?
- 8) Was at least one attendant wearing an ARK Project t-shirt?
Yes_____ No_____
- 9) Did an attendant/s tell you about ASHFest?
Yes_____ No_____
- 10) Did you think that the table looked neat and orderly?
Yes_____ No_____
- 11) Would you have approached this table if you were NOT a secret shopper
Yes_____ No_____
- (i.e. you were passing by)?

Please provide any additional comments here:

Description of Leader Positions

Ashley Ryan Krueger Project
Spring 2005

DESCRIPTION OF LEADER POSITIONS

Group Leader

(1 from sorority, 1 from fraternity, & 2 from CABS team (5 total))

DESCRIPTION OF RESPONSIBILITIES: Representatives will:

- serve as the primary representative for Leah and ARK leaders on behalf of their group. Report summaries of concerns, suggestions, and planning needs on behalf of their groups at leader meetings or privately to Leah, when appropriate.*
- keep an inventory of intervention materials held by group (i.e. bracelets, stickers, etc.).
- attend and present status information in all leader meetings.
-

*All group members are encouraged to participate as actively as they desire and the Rep Leaders will serve as their advocate when they are unable to voice concerns and ideas themselves.

Treasurer

DESCRIPTION OF RESPONSIBILITIES: Treasurer will:

- serve as primary contact for Leah and ARK leaders regarding project finances.
- maintain spreadsheets:
 - accounts payable and receivable
 - donations
- attend and present status information in all leader meetings.

Leader of Fundraising

DESCRIPTION OF RESPONSIBILITIES: Director of Fundraising will:

- serve as primary contact to Leah and ARK leaders regarding project finances
- maintain donor database
- make sure that all donors receive thank you letters
- mail all requests for donations during fund drives to previous donors and potential donors
- work closely with all ARK project leaders to develop effective fundraising events during the intervention phase.
- attend and present status information in all leader meetings.

Leader of Community Relations

DESCRIPTION OF RESPONSIBILITIES: Director of Community Relations will:

- coordinate all tabling based on leader consensus
- coordinate all booth attendance
- coordinate placement of signage and flyers
- coordinate other community relations events as determined by ARK leaders and Leah
- attend and present status information in all leader meetings.

ALL LEADERS WILL BE TRAINED BY LEAH.

Weekly Planning Meeting with The A.R.K. Project Leaders: Photo



GRADUATE EDUCATION:

Virginia Tech, Blacksburg, VA
In progress: MS/PhD, Psychology

Columbia University, Teachers College, New York City, NY
In progress: MA, Health Behavior Studies

UNDERGRADUATE EDUCATION:

Appalachian State University, Boone, NC
BS, Psychology
Overall G.P.A.: 3.97/4.00

Summa Cum Laude, 12/00
Major concentration in Health Psychology
Major G.P.A.: 4.00/4.00

CLINICAL PSYCHOLOGY EXPERIENCE

VIRGINIA TECH PSYCHOLOGICAL SERVICES CENTER, Blacksburg, VA

Graduate Clinical Practitioner, 8/04-Current

- Provision of cognitive behavioral therapy & psychological assessment
- Case discussion & supervision with graduate practicum team

NEURAL SCAN BEHAVIORAL ASSOCIATES, LLC, Roanoke, VA

Psychological Assessment Technician, 6/05-8/05

- Conducted and scored psychological assessments

ACADEMIC RESEARCH EMPLOYMENT

CENTER FOR APPLIED BEHAVIOR SYSTEMS, VIRGINIA TECH, Blacksburg, VA

Graduate Research Associate, 8/04-Current

- Participate in design, implementation, and evaluation of various research projects
- Supervise undergraduate research

COLUMBIA UNIVERSITY IN AFFILIATION WITH HARLEM HOSPITAL, New York, NY

Program Assistant, 8/03-10/03

(Harlem Adherence to Treatment Study & Tuberculosis Clinical Trial Network)

- Assisted in grants and IRB processes
- Performed duties of research assistant: entered and analyzed data
- Performed administrative duties as needed

COLUMBIA UNIVERSITY IN AFFILIATION WITH HARLEM HOSPITAL, New York, NY

Research Assistant & Health Educator, 8/01-11/02

Health Educator (Harlem Adherence to Treatment Study) 12/01-11/02

- Conducted one-on-one health education sessions
- Prepared and presented information on adherence to antiretroviral medication to patients, physicians, and community organization staff members
- Created client-centered publications about adherence and HIV related information
- Facilitated support groups and therapeutic theater workshops
- Maintained/ordered stock of adherence tools and promotional materials
- Participated in community advisory board meetings, neighborhood network meetings, and local/state/national research meetings

ACADEMIC RESEARCH EMPLOYMENT, Cont.

- Research Assistant** (Harlem Adherence to Treatment Study) 8/01-12/01 & on-going, as needed
- Recruited patients from infectious disease clinic and methadone maintenance clinics
 - Interviewed patients about adherence to HIV/AIDS medication
 - Collected, integrated, organized, and submitted data to NY State AIDS Institute
 - Entered and analyzed data
 - Prepared and submitted poster presentations to national and international conferences

CONSULTING EXPERIENCE

INTRAMED EDUCATIONAL GROUP & PRECEPT MEDICAL, New York, NY

Freelance Advisory Board Meeting Manager, 9/03-Current

- Travel nationwide to industry-sponsored psychiatric advisory board meetings on Anxiety, Depression, and Alzheimer's Disease to manage on-site logistics

CORPORATE MARKETING EXPERIENCE

INTRAMED EDUCATIONAL GROUP, New York, NY

Associate Program Director, 11/02- 8-/03

- Developed proposals, and coordinated national continuing medical education and promotional programs about Anxiety, Depression, and HIV at national medical conferences
- Liaised between pharmaceutical sponsor, accreditors, and physicians to develop medical symposia, publications and webcasts
- Traveled to medical conferences and facilitated continuing medical education programs

OTHER EMPLOYMENT:

CUSTOM STAFFING, New York, NY

Corporate Staffing Recruiter/Counselor, 1/01-8/01

- Recruited, interviewed, and placed candidates for employment in various industries

GRADUATE INTERNSHIP

MOUNT SINAI HOSPITAL OF QUEENS, New York, NY

Assistant to Director of Worksite Wellness Program, Summer 2003

- Facilitated worksite health fairs at New York City sites
- Authored newsletters:
 - Automated Electronic Defibrillators in the Workplace
 - Influenza Vaccination in the Workplace

SCHOLARLY PUBLICATIONS & PRESENTATIONS:

Farrell, Leah V., Cox, Matthew, G., Drake, Elise A., Geller, E.S. (May, 2006).

Peer-Delivered Prompting for Student Safety-Belt Use on a Large University Campus: The "Flash-for-Life" Technique. Poster to be presented at the 2006 Annual Conference of the America College Health Association, New York City, New York.

Farrell, Leah V., Drake, Elise A, Cox, Matthew G., Geller, E.S. (May 2006).

Prompting Safety-Belt Use: The "Flash for Life" Technique Revisited in the Context of Safety-Belt Use Laws. Poster to be presented at the 32nd Annual Conference of the Association for Applied Behavior Analysis, Atlanta, Georgia.

SCHOLARLY PUBLICATIONS & PRESENTATIONS, Cont.:

- Drake, Elise, A., Clarke, Steven W., Cunningham, Thomas R., **Farrell, Leah V.**, Valentino, Sara E., & Kim, Si Jun. (May 2006). Analysis of Blood Alcohol Levels among 21st Birthday Celebrants on a College Campus. Poster to be presented at the 32nd Annual Conference of the Association for Applied Behavior Analysis, Atlanta, Georgia.
- Farrell, Leah V.**, Detrick, Corey T, Phibbs, Gary N., Cox, Matt G., Geller, E. S. (November, 2005). The A.R.K. Project: A Grassroots, Student-led Intervention to Increase Safety-Belt Use on the Virginia Tech Campus. Poster presented at the 8th Annual Conference of the Maryland Association for Applied Behavior Analysis, Baltimore, Maryland.
- Farrell, L.V.**, Cox, Matthew, G., Geller, E. Scott. (Paper submitted for publication in October 2005). The “flash-for-life” revisited: prompting safety-belt use in the context of belt-use laws. *Journal of Applied Behavior Analysis*.
- Farrell, L.V.**, Drake, E.A., Wiegand, D.M., Andrews, R., Zimmerman, M., & Geller, E.S. (May 2005). Evaluating a Community-Based Safety Belt Campaign: BuckleUp in Memory of Ashley Ryan Krueger. Paper presented at the 31st annual convention of the Association for Behavior Analysis: Chicago, IL.
- Farrell, L.**, Drake, E.A., Cox, M.G., & Geller, E.S. (March 2005). The A.R.K. Project, Intervening on a College Campus to Increase Safety-Belt Use in the Spring of 2005. Poster presented at the 1st annual meeting of the Virginia Association for Behavior Analysis, Harrisonburg, VA.
- Downing, C.O., **Farrell, L.V.**, Cunningham, T.R., & Lehman, P.K. (April, 2005). Exploring the Convergent and Divergent Validity of Psychological Entitlement With Other Psychological Self-Report Measures. Poster presented at the semi-annual meeting of the Virginia Psychological Association, Williamsburg, Virginia.
- Harris, D.M., Hintz, L., Mistler, S., **Farrell, L.V.**, & Cunningham, T. (December, 2004) Intervening with Food at Fraternity Parties: Does it Impact Intoxication Levels? Poster presented at the 7th annual meeting of the Maryland Association for Behavior Analysis, Baltimore, MD.
- Egwuatu, N.E., Colson, P., Findley, S., Holson, N., Perkins, M., Diamond, D., Hirsh-Moverman, Y., El-Sadr, W., **Farrell, L.** (November, 2002). Application of Stage of Behavioral Change Model To HIV Antiretroviral Adherence. Poster presented at the 130th annual meeting of the American Public Health Association, Philadelphia, PA.
- Mannheimer, S., Holson, N., **Farrell, L.**, Diamond, B., Hirsh-Moverman, Y., Perkins, M., Ford, J., El-Sadr, W. (July, 2002). Predictors of Mortality Among HIV-Infected Outpatients Attending an Inner City Clinic. Poster presented at the XIV International AIDS Conference, Barcelona, Spain.
- Mannheimer, S., Perkins, M, Ford, J., Diamond, B., **Farrell, L.**, Findley, S., Hofmann, A., El-Sadr, W. (July, 2002) Factors Associated with Provider Estimated Adherence to Antiretroviral Therapy are Different from Self-Reported Adherence. Poster presented at the XIV International AIDS Conference, Barcelona, Spain.

PSYCHOLOGICAL ASSESSMENT PROFICIENCIES:

Beck Anxiety Inventory
Beck Depression Inventory
Bender Visual Motor Gestalt Test
Conners' Adult ADHD Retrospective Interview
Conners' Adult ADHD Rating Scale (Self)
Conners' Adult ADHD Rating Scale (Other)
Conners' Continuous Performance Test-II
Delis-Kaplan Executive Function System Test
Mental Status Exam
Millon Clinical Multiaxial Inventory, 3rd Edition
Minnesota Multiphasic Personality Inventory, 2nd Edition
Paced Auditory Serial Attention Test
Structured Clinical Interview for DSM-IV Personality Disorders
Symptom Checklist 90 - Revised
Wechsler Adult Intelligence Scale, 3rd Edition
Wechsler Intelligence Scale for Children, 3rd Edition

PSYCHOLOGICAL ASSESSMENT PROFICIENCIES, Cont.:

Wechsler Memory Scale, 3rd Edition
Wender Utah Rating Scale (Self)
Wender Utah Rating Scale (Parents)
Woodcock-Johnson III Achievement Test, 3rd Edition
Wisconsin Card Sort

UNDERGRADUATE RESEARCH AWARDS AND PRESENTATIONS:

- Oral Presentation: National Conference on Undergraduate Research, Missoula, MT, May 2000
- Oral Presentation (both years): ASU Undergraduate Research Day, May 1999, May 2000
- Oral Presentation: As Undergraduate Research Representative/ Student Liaison to College of Arts and Sciences Advancement Committee, Fall 1999

UNDERGRADUATE INTERNSHIP:

THE MEDICAL FOUNDATION, Boston, MA

Training Curricula Developer/Co-Trainer & Coordinator of Programs, Summer 2000

- Developed, designed and implemented curricula to target urban adolescents:
 - Water Pollution Awareness
 - Osteoporosis Prevention
- Researched material for project and program development

UNDERGRADUATE ACADEMIC HONORS & AWARDS:

- Who's Who Among College Students in American Colleges & Universities, Spring 2000
- Chancellor's List, Spring 1999, Fall 1999, Spring 2000, Fall 2000
- Dean's List, Fall 1998

UNDERGRADUATE LEADERSHIP POSITIONS:

- **President of Chapter PSI CHI**, National Psychology Honors Fraternity, Spring 2000
- **Vice President of Chapter PSI CHI**, Spring 1999- Fall 1999
- **Peer Career Counselor**, 1998-2000
- **Research via Independent Study, Spring 1998-2000**
 - Gender Role Representation in Children's Literature
 - Thought Suppression & Working Memory
- **Health Fair Planning Committee Member**, Spring 2000
- **Student Health Advisory Committee Member**, Fall 1999-Spring 2000