Increasing Seatbelt Usage Rates among High School Students

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Abstract

While seatbelt use has increased considerably during the last two decades, non-use and inconsistent use is still a significant problem, especially among youths. In addition, population-wide seatbelt rates may appear acceptable, but the rate is low in fatal accidents, especially for younger males. For Rhode Island High School students, Berman, Schaffran, and Fong found that a sizeable percentage fails to use seatbelts consistently. This project was designed to encourage teenage seatbelt use by developing innovative targeted interventions which take into consideration individual differences, such as Prochaska's *Stages of Change*, are based on resources available at individual schools, and rely primarily on peer influence and reinforcement. A 5-10 % increase in seatbelt compliance occurred after varied student-based interventions and high visibility peer observations. The gender gap needs to be addressed further. This report includes a Sample Intervention Program and discusses continuity beyond the funding period.

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Key Ingredients of the Project

- High Visibility Enforcement using visual surveys conducted by various groups of students throughout the school year.
- Provide enforcement tools to the school and identify 'sustainable' resources which enable and encourage continued activities beyond this project
- Social Proof by utilizing positive peer pressure towards risk avoidance regarding seatbelt use, speeding, DUI, and driving distractions.
- Innovative Communication Channels, notably social networking and student generated video.
- Bottom-up approach utilizing student generated messages and activities; high student involvement.
- Targeting messages to Gender and Stage of Change

Five years after their study, initial visual surveys at four high schools reiterated the concerns raised by Berman, Schaffran, and Fong, notably substantial non-compliance, lower compliance among males, passengers, and particularly males driving or riding in pick-up trucks.

Since limited gender based information was available, analysis of FARS data was conducted, which confirmed an even stronger level of risk and lack of safety restraint compliance for males. These result underscored the need for interventions which can reach even those in the *Precontemplation* stage who are not even planning to wear seatbelts in the foreseeable future.

Student groups developed 'grass-roots' interventions with special emphasis on those at the lower stages of change, with particular attention to non-compliant demographic segments.

Observed results indicate considerable improvement in seatbelt compliance. However, the gender gap persisted. Researchers are working with the schools on options to make interventions 'sustainable' after project has ended. A shift to multi-risk interventions is proposed.

Background

Seatbelt use has experienced a considerable increase since the 1980s due to greater awareness, enforcement levels, fines and penalties, and in particular the introduction of primary seatbelt laws in many states. While primary seatbelt laws are a key driver in seatbelt compliance, there is considerable variation within secondary (and primary) seatbelt states. In addition, demographic and lifestyle factors have a significant impact on compliance.

According to the RI *Strategic Highway Safety Plan*, seatbelt use in Rhode Island is considerably lower than the national average. Also, the rate of observed seatbelt use has lagged behind the national average, but it has been slowly increasing since 1994 and peaked in 2007 at 79 percent, only to decline to 72 percent in 2008. One of the key objectives of the Safety Plan is to "… achieve an annual reduction in unbelted fatalities and serious injuries to lower than the 2002 to 2006 average" (p. 19). In addition, the *Plan*

also emphasizes the need to address young drivers, who constitute a disproportionate share of fatalities. Public education campaigns aimed at drivers age 16 – 24 play a key role in the Plan's recommendation.

This interim report discusses conceptual discussions related to individual differences and appropriate interventions and results from data collection at selected high schools in Rhode Island. Observational data indicate that overall seatbelt compliance for high school students is (only) around 80 percent, with significantly lower levels of compliance for males, passengers (as compared to drivers), and persons in pick-up trucks (males in particular). Current activities are geared toward raising overall awareness, targeting males in particular, and utilizing 'Web2.0' communication technologies to reach target audiences.

In particular, making seatbelt related activities self-perpetuating after the end of the funding period is critical. Schools have health classes, volunteer groups, service and Senior projects, etc. which might lend themselves to institutionalizing student generated traffic safety activities. However, these are frequently either 'top-down' rather than 'bottom-up' and they follow a simplistic modeling or fear-based paradigm rather than active student involvement and targeting.

Due to retirement and administrative duties P.I.s changed in early 2008. In consultation with one of the original P.I.s the following Tasks were proposed for this project:

Task 1: Identify the key elements for running a successful school-based seatbelt program and for achieving measurable and cost-effective benefits in terms of increased seatbelt usage.

Task 2: Identify barriers to running a successful program and to achieving measurable and cost-effective benefits, and pinpoint how these barriers can be avoided and/or overcome.

Task 3: Draft best practice guidelines for practitioners guiding the effective implementation of large-scale programs, built around case studies derived from experiences in the pilot schools.

Preliminary Work

The original P.I.s took the extensive work by Berman, Schaffran, and Fong (2004) and began to focus on incorporating elements from Prochaska's *Transtheoretical Model of Change* (TMC). One key premise of the model is that—while some people change from one day to the next-- change for most is a long-term process which involves 5 Stages: Precontemplation, Contemplation, Preparation, Action and Maintenance.
Berman, Schaffran, and Fong (2004) applied the Stages of Change according to the Transtheoretical Model as applied to student behavioral change relative to seat belt usage. The following summary is taken from Berman, Schaffran, and Fong (p. 17):

Stage 1: Pre-contemplation

Students in this stage answer "no" when asked if they wear their seat belt given only two choices, "yes" or "no." These students are generally either unaware or unconcerned about the preventive effects of buckling up. Students of this stage are not presently thinking about the benefit of seat belt usage.

Stage 2: Contemplation

Students in contemplation are aware that non-use of a seat belt is an unnecessary risk and though they may desire to make a change in their behavior, are not yet actively displaying a positive behavior. They answer "yes" when asked if they wear their seat belt and that their usage has increased in the past 12 months, but also follow with answers representative of different behaviors when asked why they are less likely to wear a seat belt when riding with others. Ultimately, students of this stage indicate that there presently are reasons why their usage is not consistent.

Stage 3: Preparation

Students in the stage of preparation are exhibiting a plan of change. Their behavior shows an awareness and desire for change, such that students answer "yes" when asked if they wear their seat belts, but also admit non-use within the past week or month.

Stage 4: Action

Students in this stage are characterized by obvious change in behavior, such that they report themselves as seat belt users and only rarely fail to buckle up, such as within the past year. Action stage users are more likely to continue onto a stage of maintenance than revert to previous behavioral stages.

Stage 5: Maintenance/Termination

At this stage, students are not likely to revert to old habits and maintain a consistent pattern of seat belt usage. They are less likely to be affected by peer pressure and less willing to ignore the usage of a belt due to inconvenience. They are in a stage of habit and have adopted a new pattern for usage, which should last throughout and beyond high school. They have adopted this change because they now recognize its benefits and make a conscious effort to protect their lives.

Originally based on experiences with self-changers, the model identified different interventions for health behaviors, some of which are applicable to transportation safety; for instance, seatbelt safety strategies that might work with *Action* might not work for *Precontemplation*. *Precontemplators* may think that wearing a seatbelt is not *'cool'* if their peers in the car don't wear one. Students in the *Precontemplation* phase respond to different messages compared to those in *Contemplation, Preparation,* and *Action*.

Persons in *Action* are already aware of the benefits of seatbelt use, and may need situational reminders to buckle up every time. For instance, we have been conducting visual surveys, which are not only a research tool, but might also serve to create awareness for students in *Precontemplation and Contemplation* and serve as encouragement and reminders for those in the more advanced stages. Results are made accessible to various constituencies in the schools through announcements, posters and videos and serve to raise awareness and motivate high school drivers at different stages.

The groundwork for the current interventions was laid by the original P.I.s. Graduate students were trained in the *Transtheoretical Model of Change* (TTM). They developed a basic understanding of the Stages, along with individual difference variables that mediate progression through those stages. The protocol was tested with URI Freshmen. A pilot was tested at Coventry High School, and other high schools were approached about participating in the project.

Application of the Transtheoretical Model of Change

Temptations: Reasons For Non-Use. Two important TMC concepts are *Decisional Balance and Temptations.* Decisional balance relates to the Pros and Cons of change. As individuals move through the stages this balance shifts towards the Pros. Different situational and psychological factors can *tempt* an individual to *relapse* into a prior stage, i.e. revert to unsafe behaviors. Prior studies have identified some factors that would weigh in as Cons of change and also as Temptations. Berman, Schaffran, and Fong developed a Rhode Island statewide student *Safety Survey* and found that among drivers who at least on occasion *did not* use their seat belt, the most frequent reasons for non-use were that they were only *driving a short distance* (56%) or *they forgot* (53%). Among non-users, when asked which reason for non-use was most important, *forgetting* (24%) ranked first and "*short distance*" (22%) second.

Temptations, Cons of Change: *Part Time Users And Non-Users*. Few persons said they never wore their seat belt. However, non-users' reasons for non-use differed sharply from part time users. Among *part time users*, the most important reasons for non-use usually related to risk perception (going only a short distance; forgetting). For non-users, their primary reasons for non-use revolved around *discomfort* and "other" considerations such as issues of personal freedom, concern about seat belts being dangerous, and the lack of an established habit.

Pressure From Group Norms. Nationally, almost one-in-five persons (18%) either strongly (10%) or somewhat (7%) agreed that "I would feel self-conscious around my friends if I wore a seat belt and they did not." This item did not appear to be related to the level of reported seat belt use (Motor Vehicle Occupant Safety Survey, 2007).

Reasons For Use; Pros of Change. Nationally, injury avoidance was the most frequent reason given by drivers for wearing seat belts regardless of demographic or usage category. However, infrequent seat belt users (77%) less often gave this as a reason than did frequent seat belt users (97%). When asked which was their *most important* reason for wearing seat belts, two-thirds of drivers (66%) said it was injury avoidance.

Following in the distance were the law (7%), habit (6%), and wanting to set a good example (5%). Infrequent users of seat belts (46%) were less likely than frequent users (68%) to cite injury avoidance as their primary reason for seat belt use, although it still was the most common reason given (Motor Vehicle Occupant Safety Survey, 2007).

Self-Efficacy. One important individual difference is *Self-Efficacy*, an individual's confidence that he/she will and can adopt, implement, and maintain behavioral changes. *Self-efficacy* has been found to be a key predictor of successful change. To apply this concept to transportation behavior one might rely on role models, reminders, and different types of rewards for consistently safe behaviors. Since using a safety belt per se is not a significant challenge in most cases, *self-efficacy* in this case might relate to the ability to manage temptations not to wear proper restraints (i.e. reasons for non-use)

Stages of Change and Temptations

Recent Findings. Demographic and usage patterns are largely comparable between the 1990s and the current research. The 2007 Motor Vehicle Occupant Safety Survey [MVOSS; Report No. DOT HS 810 975] includes some comparable observations:

Age and Gender Differences align with earlier findings. In general, compliance increases with age and is higher for females compared to males. The report does not discuss gender differences within age groups. The gender difference might be more pronounced among younger drivers compared to their older counterparts.

Reasons for Non-Use. Chapter 2 of MVOSS discusses *Reasons For Seat Belt Use And Non-Use*. Table 24 might provide guidance for the development of targeted interventions—in particular messages geared towards each gender. This might also provide clues related to *Stages of Change* for seatbelt use.

While the top reason ("Only a short distance") holds across age and gender, young drivers (16-20) are clearly higher on the following:

"I forgot to put it on"

"In a rush"

"Uncomfortable"

"People I am with are not wearing belts"

These responses point to *Temptations* in Prochaska's nomenclature. The last item underscores the great importance of *social proof* (Cialdini, 2001), in particular for teenagers. Positive role models will be important both in messages created and in school based interventions. For instance, athletes and other popular males in the school should be involved in visual surveys and other high visibility activities. Also, videos or online messages should dwell on the behavior of peers.

Other hindrances and excuses seem to indicate that part-time and non-seatbelt users have not sufficiently internalized the click-it habit (see also MVOSS 2007, *Figure 25*). Reminder systems might work in this case.

Interestingly, the item "Don't like being told what to do" does not differentiate by age, but it does by gender (M > F). As has been found in other research, male segments tend to be particularly resistant to persuasion. One approach suggested by the research on Resistance is the development of effective and sustainable student-based, "bottom-up" interventions (Graham, 2002) among target groups.

Also, "The probability of being in a crash is too low" shows a distinct gender difference (M > F). Generally, males tend to be less risk-aversive compared to females. On the other hand, males also tend to be perpetrators of high-risk crashes more frequently. Messages dramatically emphasizing the risk of being involved in such a crash should target males.

Figure 25 ("Reasons for Driver Seat Belt Use by Reported Level of Seat Belt Use") is interesting. It compares *regular* seatbelt users with those who use seatbelts *Sometimes/Rarely*. It appears that *Regular Seatbelt User*s tend to internalize 'intrinsic' reasons (Avoid serious injury; it's a habit; uncomfortable without it), while *Sometimes/Rarely Users* seem to be more geared towards external pressures ("it's the law"; don't want ticket"; "others want me to wear it").

URI Cancer Prevention Research Consortium (CPRC) Seatbelt Measures. Among the pertinent initiatives at the CPRC is Caren Francione's Masters Thesis. Her primary interest was in the impact of alcohol use on other risky behaviors, including (absence of) seatbelt use. Francione found that various measures of current and past drinking behavior predict lower levels of seatbelt use. She also assessed *Stages of Change* for seatbelt use, and found that males and heavier/earlier drinkers tend to be at lower stages (i.e. less ready for change).

Demographic Factors: Gender and Age

Limited demographic seatbelt use data are available based on observational studies. The December 2008 report for Rhode Island *Seatbelt Compliance in Rhode Island* sponsored by the Office on Highway Safety provides information on driver and passenger seatbelt use, out-of-state vs. in-state, as well as racial information, but gender and age of drivers and passengers are not available. The *Executive Summary* of the report, based on observations of more than 12,000 vehicles states:

"Specifically, the data weighted for mileage traveled by road type shows that 72.0% *of front seat occupants* were buckled in December 2008, down from 79.1% in June 2007. This estimate is about equal to that observed in 2006 (72.3%), and down from 2005 (74.7%) and 2004 (76.2%). The estimate was 58.2% in 1994 (note: weighted data); 2007 represented record seatbelt compliance for the State of Rhode Island."

Also, compliance was higher for automobiles (vs. pick-up trucks), for rural interstates and 'principal arterial-other' roads, for drivers vs. passengers, and for Caucasians vs. African-Americans.

The focus of the current study is on high school students, who are particularly susceptible to traffic safety concerns due to their lack of driving experience. Berman, Schaffran and Fong found considerable variation in compliance across schools. They also identified a gender bias in that by and large females had better compliance than males. Visual data

collected by the current P.I. in 2008 consistently found lower male compliance; in some cases the difference was dramatic.

In order to obtain more detailed age and gender data, Fatality Analysis Reporting System data were used [http://wwwfars.nhtsa.dot.gov/States/StatesCrashesAndAllVictims.aspx/]; numerous queries for 2007 and 2006 data for RI and US data provided insights in age and gender related patterns.

Fatalities and Seatbelt Use

In spite of progress regarding seatbelt compliance and enforcement, non-compliance among drivers and passengers involved in fatal accidents is high. Only 3 states (OR, MI, CA)—all three with 93 percent observed use in 2005-- have a compliance rate higher than 60 percent among fatality victims, i.e. about one in three crash fatality was not restrained. Among 11 states with 50+ percent compliance among fatality victims, all have primary seatbelt laws; but even in WA, the state with the highest monetary penalty ($101 in 2005) and a 95 percent observed usage rate, only 54% of fatal accident victims were restrained! Rhode Island has a secondary seatbelt law, albeit with a fairly high monetary penalty; only 35 percent of fatal accident victims were restrained. Clearly, while it is important to target the population at large, reaching those who never or only rarely buckle up is pivotal. Presumably many engage in other high-risk behaviors (e.g. speeding, distracted driving, late-night driving and fatigue, DUI at the same time). One additional risk factor is lack of driving experience, which is naturally prevalent in the teenage demographic.

Age. Of all age groups, fatality rates are highest for those age 16 -20, most of whom are of high school age (FARS, 2007 data). Presumably these young drivers have little experience driving, especially with challenging traffic, weather, distractions, and other circumstantial factors.

Gender. Females overall tend to show a higher level of seatbelt compliance than males. This point is becomes even more apparent when reviewing fatality data as a function of gender and type of restraint. There is clearly a dramatic gender difference. Of the 39 male motor vehicle-related fatalities in Rhode Island 2007, only 4 wore a seatbelt. Even after subtracting 3 “helmet” and 6 “unknown” for a base of 30, the percentage of those wearing seatbelts is 13.3. Of 16 female fatalities, 10 wore seatbelts (one of them lap-only), i.e. 62.5 percent. When subtracting 3 ‘unknown’ from the base, the percentage rises to 76.9. Nationally, using the base of total fatalities minus “unknown” and “helmets,” the percentage of fatalities involving “lap and shoulder belt” use is also lower for males (28.6% of all male fatalities) compared to females (42.9%), but the gender difference is far less dramatic than for Rhode Island fatalities.

Of particular significance for this project is the seatbelt use among the 16-20 year old demographic. This was the group with the highest number of fatalities (9 male, 5 female). Only 2 males, but 4 out of 5 females wore seatbelts. By contrast, the gender difference was less pronounced in the 59 non-fatal accidents: About half wore seatbelts, 13 out of 35 males and 15 out of 24 females.

Based on FARS, RI Fatalities in 2006 were higher than 2007, comprising 59 males and 22 females. But only 4 of the males wore seatbelts (7.2%), while 9 of the females did. Among 16 – 20 year olds there were 8 male and 1 female deaths in this category, but not a single one was buckled!

Male motor vehicle fatalities in Rhode Island (72.5% of combined fatalities when averaging 2003-2007) are roughly 3 times the rate for females (27.5%), comparable to 2007 national figures of 29,039 (70.7%) male vs. 12,011 female (29.3%) traffic fatalities. Interestingly, in Rhode Island the seatbelt rate among female fatalities is close to the population percentage of drivers wearing seatbelts. However, for males it is much lower. It might be that males involved in fatal accidents are generally more risky drivers (maybe speeding, DUI, and other distractions play a greater role).

Alcohol. The following brief excursion indicates that lack of seatbelt use tends to coincide with other risk factors, notably alcohol consumption: In the 2007 RI data, out of 14 male fatalities involving BAC levels of .08 or above, only 1 wore a seatbelt. Looking at national data, of U.S. fatalities involving alcohol use above .08 (or BAC test refusal), 4,907 (84%) males were NOT restrained, while 1,018 wore a lap-and-shoulder belt, almost a 5:1 ratio, for females the ratio is close to 3:1 with 932 (70.5%) NOT restrained vs. 303 wearing a lap-and-shoulder belt. When combining both genders, 81.5% were NOT restrained compared to 18.5% who were.

Speed. Speed also appears to be related to seatbelt use. In the U.S. data, fatalities occurring at 55 mph or less were compared to those at 80 mph or greater. For both genders seatbelt non-use was higher in the higher speed situation: males: slow = 64.2 %, fast=71.5% non-use; females: slow=45.2%, fast = 65.3% non-use. It should be noted that only a small percentage of females were involved in high-speed vs. slower speed accidents (274 vs. 2192) compared to males (1026 vs. 3812).

Total Traffic Fatalities in RI2007 (FARs)			
Age	Male	Female	total
<16	2	2	4
16-20	9	5	14
21-24	7	3	10
25-34	10	2	12
35-44	4	1	5
45-54	7	1	8
55-64	4	2	6
65-69	2	0	2
>69	6	2	8
Total	51	18	69

Traffic Fatalities / Shoulder & lap belt			
Age	Male	Female	total
<16	0	1	1
16-20	2	4	6
25-34	1	1	2
35-44	0	1	1
55-64	0	1	1
>69	1	1	2
Total	4	9	13

Traffic Fatalities in RI 2007 / none used			
Age	Male	Female	total
<16	2	1	3
16-20	4	0	4
21-24	6	1	7
25-34	6	1	7
35-44	4	0	4
45-54	5	0	5
55-64	4	1	5
65-69	2	0	2
>69	5	1	6
Total	38	5	43

Applications to High Schools

Berman, Schaffran, and Fong's (2004) work provides a basic understanding of Pros and Cons specifically for High School students. When asked if they are just as likely to wear their seat belts when driving with friends as when they are alone, 67.6% of 9th-12th graders answered "yes ". Only 11.9% said their usage would be less likely. When the same information was evaluated by grade, 9th graders were more likely to be influenced by peer pressure than 12th graders, showing a 9% difference. The major conclusion from high school students is that peers influence an individual's likelihood of usage as well as his/her increase of usage.

Similar to the national population wide data, Berman et al. found that students reported, *"traveling a short distance"* as the number one reason (17.5%) why they are less likely to wear a seat belt. There seems to be a progression towards greater maturity as 9th graders were even more likely to respond for this reason (or excuse) than all other graders, showing a response rate of 22.6%. The 12-grade response rate was only 13.2%.

Methodology

School-based Assessments and Interventions

Year 1. Some schools had been selected by the original PI for this project and initial plans were developed. The current PI contacted intervention schools and obtained approval from Superintendent/School Principal and further refined the initial plans. Special emphasis was placed on Narragansett High School, which had especially low initial safety belt compliance in the Berman, Schaffran, and Fong study, which improved considerably after some interventions by these researchers.

Due to its smaller size, existing SADD group, and cooperative staff this school provided a beneficial setting. A number of meetings were conducted with school personnel and students, in particular:

- The School Nurse, who had participated in the earlier study and demonstrated a strong commitment to supporting the project. She is trained in public health and has a good grasp of the Stages of Change model. She remained the key point of contact to other school personnel.
- The Director of the School-to-Career Program, who has daily contact with at risk populations. Students involved in the program are often involved in automotive activities, including street racing, and were very interested in the practical aspect of this project.
- The Resource Teacher, who is the direct contact to the SADD (Students agains Destructive Decisions) group at the school, and who also maintains one-on-one contact to a number of students who might be involved in the project.
- The Athletic Director and the Football Coach, who promised support at athletic events, and who also suggested activities in which athletes would be able to reach segments of the school population that are typically difficult to target.
- The Senior Project advisor, who supervises the projects conducted by seniors, which typically have an outreach component and cover a variety of issues. It was deemed desirable to identify a number of current juniors who would take on a project related to traffic safety.
- The SADD advisor, who is a former NHS student, now at URI studying to become a teacher.

The SADD group had already independently planned a seatbelt related initiative during SADD week in March. After meetings with the SADD advisor, who is currently a URI undergraduate, and about 15 students in the SADD group, the students agreed to follow the visual survey protocol established by Berman, Schaffran, and Fong and to conduct visual surveys on each of 4 days during SADD week. Students also committed to working with this project during the 2008/09 school year.

North Kingstown High School (NKHS) became the other intervention school, since it has a strong media department with a teacher who is committed to long-term collaboration. Media arts teacher Aaron Thomas became the primary contact. He has been involved in the production of Public Service Announcements for several years, including traffic safety related work. Mr. Thomas teaches several media classes and also

supervises seniors for their Senior Project. He also serves as the head basketball coach and is involved in the high schools sports groups.

Contacts were also established at South Kingstown (SKHS). After a discussion with the SKHS principal and the resource teacher, several meetings with the school club *Natural Helpers* took place. *Natural Helpers* is a volunteer group supervised by the resource teacher and engaged in a range of prosocial activities chosen by the members. *Natural Helpers* conducted a visual survey of seatbelt use. Due to a change in membership and emphasis among *Natural Helpers* the group decided no longer to participate in the project. SKHS does not have an active SADD group.

Comparative Baseline Data, 2004-05 and 2008-09 School Year

Results of the exploratory work conducted in March-June 08 were analyzed, graduate and undergraduate students at URI were trained for observations and interventions at the schools. In the meantime, research was conducted comparing other work on risky driving behaviors—in particular inconsistent seatbelt use, but also cell phone and text message use by teenage drivers. At the same time, the PI was involved in numerous discussions at URI's Cancer Prevention Research Consortium (CPRC) in order to adapt Prochaska's Transtheoretical Model of Change to transportation behaviors.

Continuing and new school-based initiatives were under way with the new school year. The PI worked with volunteer high school students and their advisors to prepare survey administration and conduct observations to determine usage rates. In addition, alternative strategies for boys and girls and older and younger students were brainstormed. Additional students were trained on how to collect observational data at their school and analyze the data. Observational data are easier and more cost-effective for students to collect and are more consistently "accurate" than are survey data. The research team is currently discussing alternative and less intrusive ways of collecting the survey data.

North Kingstown. Several meetings at **NKHS** were conducted with the media teacher, a group of students, including one in student particular who is conducting his Senior Project creating videos and conducting seatbelt safety related research. The PI worked with this student to create his Senior Project proposal and provided feedback on video ideas.

NKHS students conducted an initial visual seatbelt survey at the school in September 2008. It resulted in an overall 82 percent compliance rate. Rates for passengers were lower than for drivers, and rates observed at the Junior lot entrance were lower than those at the Senior lot. In October, November, and in January 09 the PI met with the group again and strategies for a student originated seatbelt campaign were discussed.

North Kingstown High School Intervention. Seatbelt compliance was relatively high (compared to other RI High Schools) in NK at baseline (.80). In spite of a slight setback in Spring 09 overall compliance rose from .80 to .87 (drivers) and .89 (passengers). Closer inspection of the results indicate that male compliance initially trailed by 10

percentage points. While female compliance rose to 97 percent (!), males remained in the high 70s. Consequently most of the impressive improvement at the school is due to female compliance. Also, the males revealed the typical deficit of passenger vs. driver, while for females there is no clear pattern of higher driver compliance.

The intervention at the school consisted of videos, which were produced by students in the Media class (including a Senior Project) and then shown on the school's closed-circuit television network. Most of the students creating the videos were male, and the videos tended to feature male protagonists. While male compliance rose somewhat, the impact appeared to be primarily on females. This may be due to a 'ceiling effect' where compliance among young males tends to peak in the low 80 percent range. It is not clear that this effect exists; would have to be verified by analyses from high-compliance states. On the upside, the very high compliance rate among females is impressive. It is further evidence that females are more risk aversive than males, but also that they are less resistant to persuasion than their male counterparts.

As NKHS represents a school with a favorable climate for safe behavior, it could become a testing ground for strategies to specifically target males. On the other hand, females and the vast majority of males who are compliant need to be continuously supported and reminded of the need to wear their seatbelts not only on the way to school but also in other, potentially risky situations.

Tables 1-a, 1-b, 1-c; and Figure 1-a, 1-b, 1-c for *North Kingstown HS*

Narragansett. Initiatives at Narragansett High School were delayed due to construction at the school, which caused the SADD group to conduct its first meeting in October. A Police Dept. seatbelt demo was scheduled for mid-day Oct. 7. In order to capture data prior to this event, a visual survey was conducted by the PI and several student volunteers in the morning of Oct. 7. This survey resulted in an 82 percent seatbelt usage rate—considerably higher than during earlier observations. Several seatbelt related activities have been conducted at the school since April, notably 2 Spring visual surveys conducted by SADD, which were followed by announcements at the school. Also, there had been some limited publicity about the Seatbelt Demo beforehand. These factors may have combined to add visibility and lead to an increase in seatbelt compliance.

Tables 2-a, 2-b, 2-c; and Figures 2-a, 2-b, 2-c for *Narragansett HS*

The results for Narragansett indicate several interesting patterns. During our first observation in October 2008, a 14 percent difference in seatbelt compliance favoring females confirmed the previously identified *gender* bias. An even more pronounced gender difference shows female drivers 17 points ahead of male drivers. For passengers the difference was 10 points. At the most recent (Jan. 2010) observation the gender difference was 12 points. The gap almost disappeared for drivers (4 point difference), while it was 30 points (!) for passengers.

While all other observations were conducted in the morning before school, the 12/16/09 observation was done in the afternoon. The gender difference at this observation was extreme (.92 for females vs. .65 for males). Aside from random factors (smaller n during this observation), this might indicate that males are more conscientious in the morning while they become more careless after school. Some males may also simply delay buckling up until they have left school property. At any rate, this observation indicates the need to better understand after-school behavior, which is closer to evening and night-time, when most fatal accidents in this age group happen.

Increased after-school observations could also draw attention to this issue among male students. It could be combined with messages and other interventions associated with sporting and entertainment events in the evening.

The other noteworthy pattern, which was previously found in Berman, Schaffran, and Fong's work involves dramatic differences by *type of vehicle*. Pick-up truck occupants had a seatbelt rate of only 63 percent—passengers even lower at 50 percent! This finding corroborates Berman and Schaffran's finding of 58.6 percent seatbelt compliance for male pick-up truck drivers, vs. 74.3 for female drivers.

Apparently a large part of the low compliance for pick-ups is due to the prevalence of males (who also tend to be primarily the drivers of these vehicles).

South Kingstown. South Kingstown had a fairly low compliance rate of .73 in 2004 (.70 m, .75 f). In South Kingstown data were collected on two consecutive days. The gender pattern in South Kingstown became far more pronounced in 2008. As in the other schools it appears that females became far more conscientious over the past 4-5 years, while males maintained their behavior patterns.

Tables 3-a, 3-b, 3-c, 3-d for *South Kingstown HS*

Comparing 3 'South County' Schools. All three schools demonstrate a comparable pattern. They showed overall considerable improvement over the 2004 survey (Narragansett had already improved after an intervention during the 2004 project, but it maintained this higher compliance level). This may be due in part to *click-it-or-ticket* and similar activities, higher awareness level at the school, and parental influence.

However, it is worrisome that by far the greatest improvement is due to increased female compliance while males showed very tepid effort.

Tables 4-a, 4-b, 4-c, 4-d, 4-e; Figures 4-a, 4-b, 4-c for *Three South County HSs*

Scituate. Contacts were also established with Erika McCormick, the advisor for the SADD initially group at Scituate High School in the Northern part of the state. The SADD group decided that they would take on seatbelt safety as their project and conducted an initial visual survey. Initial results for Scituate produced dramatic gender effects: in the parking lots used by students female compliance was 86 percent, in contrast with only 67 percent for males.
In the student parking/drop-off area student seatbelt use was even lower, at 72%. Gender differences were more pronounced than observed at other schools: Females 81 percent vs. males 60 percent! Also, the difference between drivers (78%) and passengers (64%) was pronounced (passengers similar to NK).

Tables 5-a, 5-b, 5-c; Figure 5-a, 5-b, 5-c for *Scituate High School*

Below is a brief overview of activities by the Scituate SADD Group:

1. On 12/4/08 made cards that hang from the rear view mirror facing the driver reminding them to buckle up. With each card was an attached note announcing that this was a contest. The rules of the contest stated that if your car was spotted with the reminder card hanging from the rearview mirror then you could win a chance for a $25 gas card. The cards with instructions were placed under the windshield wipers of each car in the school parking lot. On 12/18 the group recorded winners and gave away 3 gas cards.

2. Each week a new message about **buckling up** was displayed in the school display case on the front lawn. This case is visible to all cars passing the school.

3. The students made posters from materials received from a representative from RI Department Of Transportation. These posters were displayed in the class hallways. The poster was an x-ray of a neck and scull but instead of bones connecting the head to the body, it was a seatbelt buckle. The same idea was used with an x-ray of the spine. The message was perceived to be very effective.

4. From the Stay Alive from Education web site http://www.safeprogram.com/photosvids.htm material was used and compiled into a video about seat belt safety. This 15 minute video was shown at an assembly for seniors and juniors, followed by a the State Police demonstration of a roll-over simulator. "The state police were so impressed with our video that they took a copy for their program."

Analysis

Characteristics of the Schools. All schools in this study are either rural or suburban. Due to the small size of the state there is no clear distinction between the two. Narragansett and SKHS are relatively far from the capital city of Providence, but are influenced by their proximity to the University of Rhode Island campus. Family incomes tend to be medium to high by Rhode Island standards. Narragansett and Scituate are somewhat more rural and might result in a higher level of pick-up truck use. Overall, the sample schools are representive based on data from Berman, Schaffran, and Fong indicating a strong gender difference among students around 70 percent male and 80 percent female for rural schools (p.7).

Gender and Stage of Change. While there is considerable prevalence of non-use among females, the data indicate that interventions need to pay special attention to male non-users. (Young) males tend to display higher risk driving behaviors than females and tend to be involved in accidents at a higher rate. Observations and self-report data have corroborated this gender gap for seatbelt use. Similar patters prevail for other risky transportation behaviors (speeding, DUI); in combination with driving distractions (music, cell phones, text messaging, food) multi-risk behaviors—which vary between genders--are gaining urgency.

Messages and strategies geared towards males and females need to be differentiated. Sports in particular have male appeal. Athletes often are expected to serve the campus and external community. A focus on safety and risk avoidance may create a highly visible vehicle for reaching the student community. On the other hand, groups such as SADD and Natural Helpers are often predominantly female. It is important to bridge this gender gap.

A sizeable group of males seems to be lower for stage of change for seatbelt use (Francione). Essentially they don't think that there is a problem, or if they do they don't think that the benefits of change outweigh the costs sufficiently. Awareness-building, consciousness-raising, emotional arousal are all mechanisms particularly suitable to these lower stages. Creating visibility for the problem is critical. Once the Preparation stage is reached, it is important to provide reminder tools and in particular 'helping relationships.' While many youths feel self-conscious if they are the only one wearing a restraint, the paradigm needs to be shifted to where peer pressure exists to always wear the restraint.

Continuity Beyond the Funding Period

Intervention Sustainability. While creativity and innovation are important for reaching beyond the traditional target audiences, it is critical to make school based interventions easy to implement. They need to become sustainable without significant outside input. Once they become part of the institutional memory of a school or student group it might be possible to establish a tradition of visual surveys, reminders, videos, online messages and student announcements in future years. And once students see that they themselves can make a difference such behaviors will be reinforced.

It is important that activities are compatible with the school calendar. Homecoming, Halloween, Christmas, Valentine's Day, Proms, Graduation might be opportunities to raise awareness since they are often associated with higher risks. Also different interventions need to be geared towards the interests to individual student groups. For instance, the media class in North Kingstown has a tradition of creating videos related to school life, and on occasion traffic safety, while other schools prefer lunchtime promotions or are interested in experimenting with Facebook and other social media.

Suggestions. It might be possible to assign a hands-on project as part of Health Education. This needs to be different from a conventional class project in that it is not perceived as just another chore (students already receive safety related messages in driver's education). One option might be to set up groups in Health class that take turn conducting the visual surveys. And since health is usually only 1 quarter there would be a significant number of students involved. Of course, teaching and applying the *Transtheoretical Model* in Health Class might be another, more challenging option.

Another option would be to make transportation safety a requirement of a volunteer hours program. Still another would be part of the requirement for homeroom or the new "activities" room items. A final option would be a requirement as part of maybe prom proposal ideas.

Schools increasingly require senior projects and portfolios. Advisors have considerable influence in making topics related to safe driving part of the range of areas students think about when they decide on a topic.

Like most behavior change, lasting modification of risky behavior is long-term in nature. High-schools are dealing with a 4-year turnover cycle which provides only a small intervention window, at a time when students are least motivated to listen to authority figures or make changes with long-term impact in mind.

Sample Intervention Program

We start with a visual survey conducted outside the school (done by the students with guidance from me) to assess what percentage of students wear seatbelts. Once that is

done and we have a baseline of information, typically a group (SADD group; video production class etc.) at the school will take on the project. I also have a student who is doing this as his Senior Project at North Kingstown HS.
The idea is that the students develop their own way of communicating to their peers, rather than professionals coming in and spreading fear messages. Some ideas that have come up were: using facebook to talk to your friends about avoiding risk, creating video, the school newspaper, announcements at athletic events.
There would be occasional (every 3 months?) visual surveys (which also serve as a reminder) and probably one in-school survey to find out more about behaviors outside of school.

Beyond that the students should come up with their own creative ideas. We want to avoid 'top-down' preachy scare tactics (they have limited appeal to teenagers). Instead focusing on social aspects, positively framed messages, and innovative communication channels (*Facebook*, *YouTube*, etc.) might be useful. The other important aspect of our approach is to target different groups of students differently (e.g. some students may wear their seatbelts sometimes but not when they are with their friends, or when they are out at night; for some males it may be a 'macho' thing not to wear seatbelts; some kids may be generally high risk and risky driving, speeding, seatbelts, even DUI may be part of a pattern).

As a preliminary conclusion, this project has identified a number of approaches that work and might allow for long-term impact. Also, a number of less promising angles were identified.

- An **instructional framework** is helpful in providing long-term change. For instance, North Kingstown offers an advanced year-long communication and media course, COM 3 which is currently involved in creating seatbelt related videos. The instructor has committed to incorporating traffic safety into his future curriculum. It is expected that at least one student/student group will focus on this topic. A town-wide wellness initiative will provide resources and incentives. Other opportunities might be based in health, art, or writing classes. Institutional support is essential for continuity.
- **Service and independent study** credit can be utilized to involve students in addressing safety and risk behaviors. Students can conduct visual surveys, create PSAs, posters, etc. This might be particularly suitable to students in athletics who could then use athletic activities as a vehicle for publicity.
- **Senior projects** and **portfolios** are increasingly required in school systems around the state. Traffic safety is particularly suitable as a **senior project** topic because it encourages independent work by the student and input by an outside supervisor (e.g. a traffic safety expert).
- **School based media** and **social networking sites** provide the opportunity to reach a large number of students. They are student originated and have long-term continuity. A school newspaper continues to exist even if students graduate. Students could report on surveys, activities, and promote contests. They could also create the context of current events (e.g. accident reports). Social networking

sites such as Facebook include numerous groups for which members sign up. However, frequently members sign up without actually getting involved. On the other hand, such sites might provide an added grass-roots vehicle.

- **School groups** provide opportunity for continuous focus on safety topics. Several SADD (Students against Destructive Decisions) have been involved in the current project. Advisors are critical for the success of the project as well as their continuity as they tend to be involved long-term. Given the need to reach males, many groups tend to be predominantly female. Increasing male involvement or collaborating with male-dominated groups (e.g. athletics) might be an option.
- **Extracurricular and recurring events** might coincide with elevated risk levels (e.g. Prom, Homecoming), and often include considerable communication among students for planning and promotional purposes. These could become 'teach-able moments' and safety interventions could become institutionalized.

Self-administered Seatbelt Observations.
Any in-school activities should be accompanied by observation of seatbelt rates before and after. In addition, schools should keep track of 'baseline' seatbelt compliance rate at the beginning of the School Year. These observations, while not strictly interventions, have multiple uses:

- Schools can compare rates with past performance and establish goals for future improvements
- Schools can compare themselves with other, comparable institutions statewide
- Subsets of drivers can be identified for targeting by internal campaigns. Based on prior research they might be males, younger drivers, those driving pick-up trucks, etc.
- Observations can be part of 'high-visibility enforcement.' The simple fact that drivers are made aware of their own seatbelt behavior creates 'top of mind' awareness of the issue.
- Observations may be supplemented with other symbolic actions. For instance, drivers may receive 'fake' tickets, or those in compliance may receive positive rewards.

Observation Methodology. Observations are conducted in the morning, before school. In most cases, a 30-minute observation period is set aside.
A short 'real life' training session is recommended in which students conduct and record observations.
A minimum of 4 student volunteers is desirable if the school has one main vehicle entrance (or parking lot) used by students (4 means they can work in shifts). A pair of students is required at each entrance. Additional volunteers are desirable to maximize attention during the often fast-paced observation process.
Student pairs will position themselves in a visible (and safe) location near the school/parking lot entrance.

Each form has 15 observations (i.e. 15 cars); a school would need 30 sheets for 450 observations. If there are multiple entrances e.g. Junior, Senior, Teacher/Parent lot it is important to include this information. Faculty and staff are included in the count if they

use the same entrance.

One student holds a clipboard with observation sheets, while the other calls out in the following sequence, e.g.:
SUV, driver: male, no seatbelt; passenger: female, seatbelt (due to time pressure no back seat use is recorded).

Variations. One important consideration is **who** does the observing. It is desirable to have a volunteer group (e.g. SADD) take responsibility for the initiative. This creates a sense of accountability and ownership. Also, group members and leaders may be more conscientious in recording and record keep.
However, it is also important to create a peer effect through these observations. For instance, in our experience volunteer groups are often predominantly female, while males tend to be more at-risk. We have worked with the Athletic Director to recruit (or 'assign') athletes (both male and female) to conduct observations. Also, students in the video class were primarily male. Not only did they create the video they also conducted repeated observations.
Afternoon and evening observations. Early morning observations should be the standard baseline, because the largest number of students arrives within a short period of time. However, afternoon observations might be valuable as an additional tool. While students are in the 'school' mode in the morning, afternoon drivers might already be thinking about leisure activities. Any 'intervention' at this time would be closer to the most risky driving time, which is after dark, and especially late-night. To get even closer to this risky time period, observations could be conducted at night before events frequented by students, notably sporting events, concerts, or movies.

Conclusion and Outlook

This School-based Seatbelt Program is a targeted intervention technique, which involves raising the awareness of socially driven decision making enhanced by information, advice, motivation and incentives. This program operates at the level of individuals and student groups in order to facilitate the making of safe journeys; it forms an important part of national and local transport policy, contributing to the suite of tools designed to promote smart choices.

A 5-10 % increase in seatbelt compliance occurred after varied student-based interventions and high visibility peer observations. The gender gap needs to be addressed further. For all participating schools seatbelt rates increased considerably since the 2004 observations and also since the baseline observations for the current project in 2008. The most dramatic increases were found in Scituate:
Females: 74% - 81% - 90%
Males: 64% - 62% - 81%

North Kingstown had a dramatic increase for females: 85% - 97%, and a moderate increase for males: 75% - 79%

The most dramatic increase in Narragansett was due to Berman et al.'s initial intervention in 2004. However, later observations showed a drop-off, but the interventions of the past two years resulted in a fairly stable picture with an impressive rate of 88% for females and a moderate 76% for males.

The current project was designed to tailor seatbelt-related messages based on individual student driving behavior, gender, and other individual differences, in particular *Readiness for Change*. In order to reach drivers at different stages of change, messages include information on a range of typical risks and challenges, and on ways to encourage regular seatbelt use. This project relies in particular on student generated messages and initiatives. This helps reach its intended target audience. It also makes the project sustainable in that students can continue it after the formal project has been completed.

Various methods to reach students can enhance the efficacy of the interventions:
Seatbelt surveys and observations conducted by students themselves
Student organizations, such as SADD, Natural Helpers, Honors Society
Academic units, such as Athletics, Health, Communication/Media, Social Studies
Individual student projects (Senior Project, community service, independent Study)
Personalized accounts on YouTube (successfully used by PI in DUI project)
Student operated websites (also *Facebook*, *iTunes*, etc. where appropriate)

High school students are exposed to countless messages on a daily basis. Information overload is overwhelming even at this young age. Any meaningful behavior change campaign has to cut through the clutter of messages. One proven venue is a 'hands-on' approach, where students are actively engaged rather than being merely message recipients as well as social support.

Rather than relying on national or statewide campaigns, our strategy was to focus on and utilize existing resources in the student population. We will continue to work with active student advocacy groups in a given school to target the intervention to this individual school, and to different student segments (tailored to Stage of Change, age, gender). The P.I. continues to be in touch with the schools to provide knowledge of communication campaigns, change processes, and media technology, to develop interventions jointly with the student groups. The more we are able to empower these groups to steer their own destiny, the more successful our strategies are likely to be.

Our contacts at Narragansett, North Kingstown, and Scituate High Schools are committed to continuously get students involved in transportation safety related projects, and we hope to expand to other schools in the State. For instance, the Athletic Director at Narragansett is planning to engage athletes, in particular males, in this endeavor. North Kingstown will continue to utilize its outstanding school media resources and instruction, and the SADD group in Scituate remains an important support structure.

This research was focused on interdisciplinary approaches to transportation behavior change centered around these principles:

1. Target audience segmentation based on age, gender and lifestyle
2. Stages of change, decisional balance and associated processes/barriers

3. Bottom-up (vs. top-down) messages generated by target groups (esp. high school and college age)
4. Utilization of social networking and current media technologies

Our approach coincides with the overall trend in health promotion and health psychology to explore multi-risk behaviors, i.e. the co-occurrence of one risky behavior (drinking) with others (e.g. speeding, cell-phone and text message use, inconsistent seatbelt use). Recent developments in health promotion have focused on Multiple Behavior Changes: "… participants may internalize common principles of behavior change communicated to them across a number of health behaviors, which may result in synergistic change effects" (Noar et al. 2008, p. 278). Research in several health areas has demonstrated improved health impacts across multiple risk behaviors, sometimes even generating unintended benefits. Recently, other work on behavior change has targeted higher level constructs; Prochaska et al. (2008) have successfully targeted school bullying and identified underlying constructs, such as Respect for self and others, that can drive multiple behavior changes.

Future work should focus on developing targeted **multi-risk** interventions for young drivers. In this current project we have worked with local high schools to involve students in assessing and promoting seatbelt use. Most fatal accidents involving youths, however, are multi-risk (seatbelt, distractions [texting, cell phone, music, passengers], speeding, night-time driving, fatigue, DUI). Recent research by Prochaska et al. has found that multi-risk interventions are feasible without compromising the efficacy of the primary goal. Targeted multi-risk interventions utilizing innovative communication and media strategies will be the next logical step to addressing risky driving among youths, and other populations. These types of interventions are complex and initial development is costly. However, once established and tested, incremental cost is small, and the pay-off in lives saved and injuries avoided could be considerable.

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Table 1-a (North Kingstown High School)

North Kingstown High School		
	Driver	*Pass.*
4/25/2004	0.8	0.79
9/22/2008	0.83	0.8
3/31/2009	0.74	0.76
9/25/2009	0.84	0.83
10/6/2009	0.86	0.78
11/25/2009	0.87	0.89

Figure 1-a (North Kingstown High School)

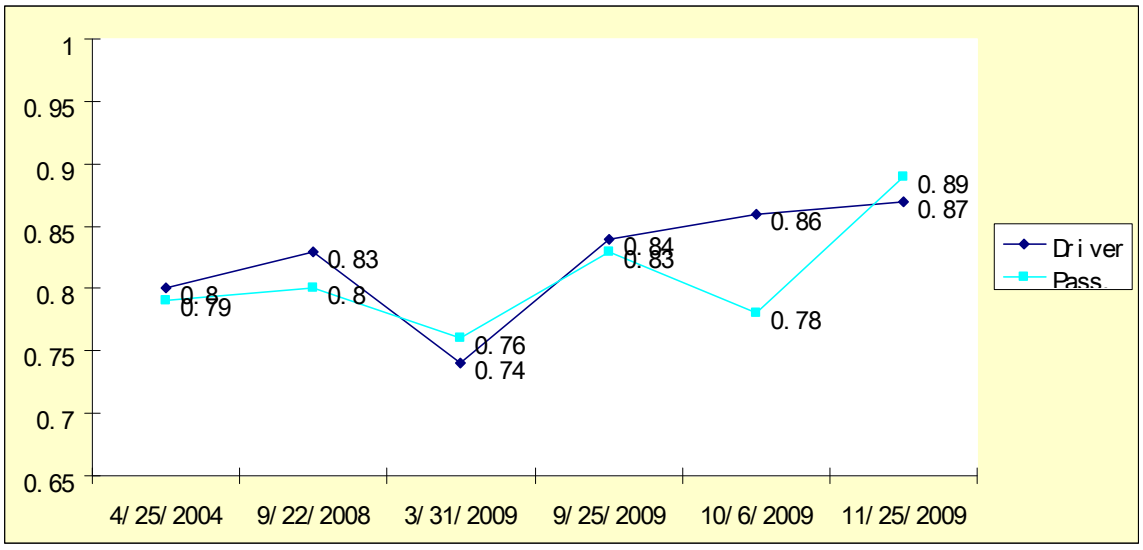


Table 1-b (North Kingstown High School)

North Kingstown High School		
	Male	*Female*
4/25/2004	0.75	0.85
9/22/2008	0.78	0.85
3/31/2009	0.73	0.77
9/25/2009	0.79	0.88
10/6/2009	0.77	0.88
11/25/2009	0.79	0.97

Figure 1-b (North Kingstown High School)

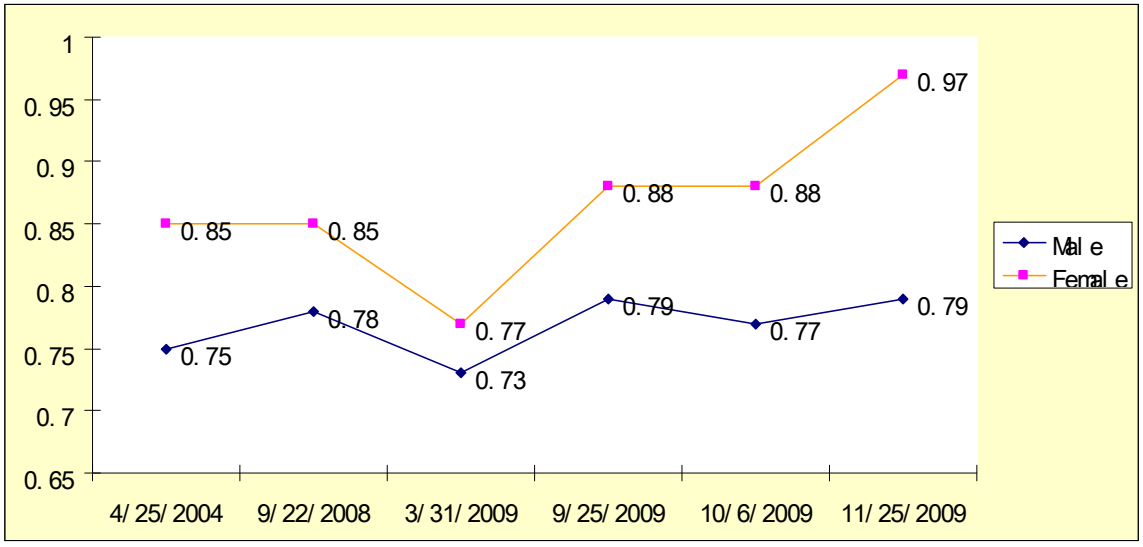


Table 1-c (North Kingstown High School)

North Kingstown High School				
	Male Driver	*Male Pass.*	*Female Driver*	*Female Pass.*
4/25/2004	0.76	0.75	0.85	0.84
9/22/2008	0.81	0.74	0.85	0.85
3/31/2009	0.74	0.72	0.75	0.8
9/25/2009	0.81	0.76	0.86	0.9
10/6/2009	0.82	0.71	0.9	0.86
11/25/2009	0.79	0.78	0.96	0.98

Figure 1-c (North Kingstown High School)

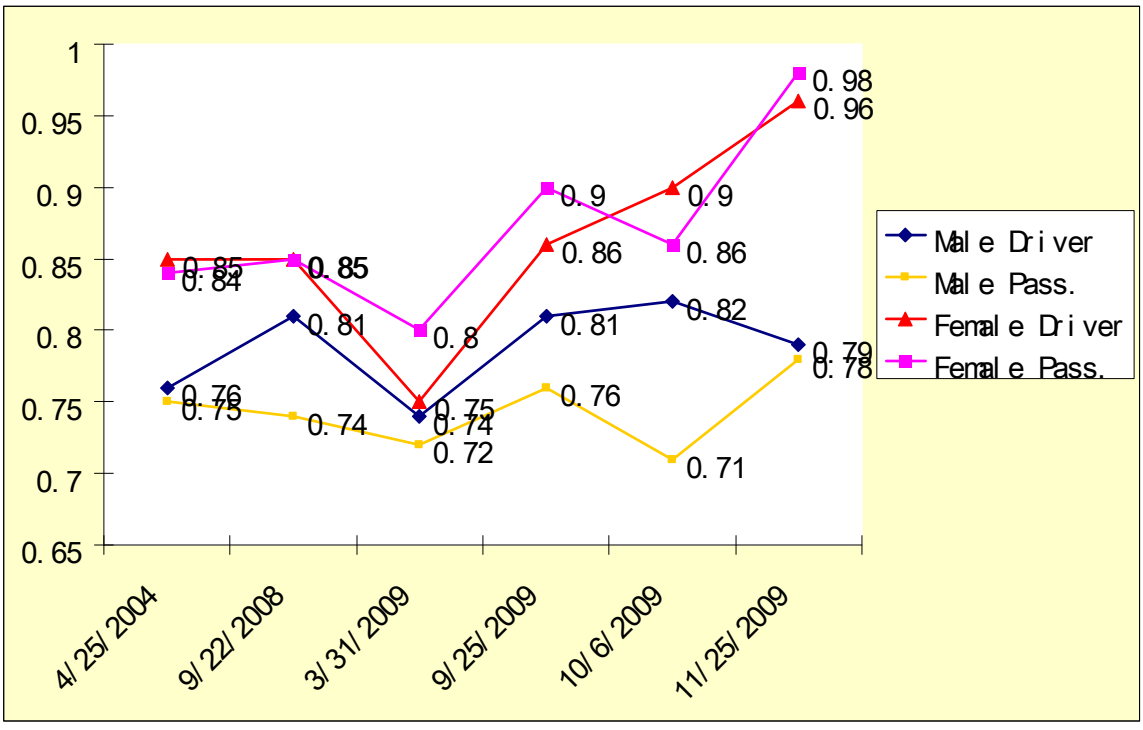


Table 2-a (Narragansett High School)

Narragansett High School		
	Driver	*Pass.*
4/25/2004	0.59	0.65
12/8/2004	0.87	0.73
10/7/2008	0.81	0.78
12/8/2008	0.77	0.79
9/25/2009	0.82	0.76
12/16/2009*	0.77	0.83
1/19/2010	0.84	0.82

[*note: 12/16/09 is afternoon observation]

Figure 2-a (Narragansett High School)

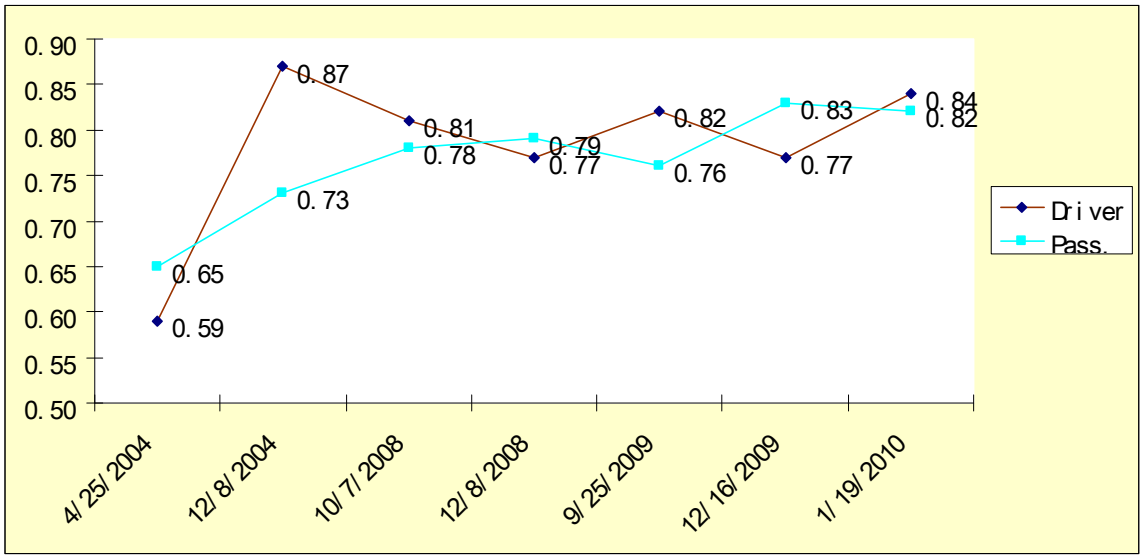


Table 2-b (Narragansett High School)

Narragansett High School		
	Male	*Female*
4/25/2004	0.52	0.68
12/8/2004	0.77	0.86
10/7/2008	0.72	0.86
12/8/2008	0.75	0.8
9/25/2009	0.74	0.86
12/16/2009*	0.65	0.92
1/19/2010	0.76	0.88

Figure 2-a (Narragansett High School)

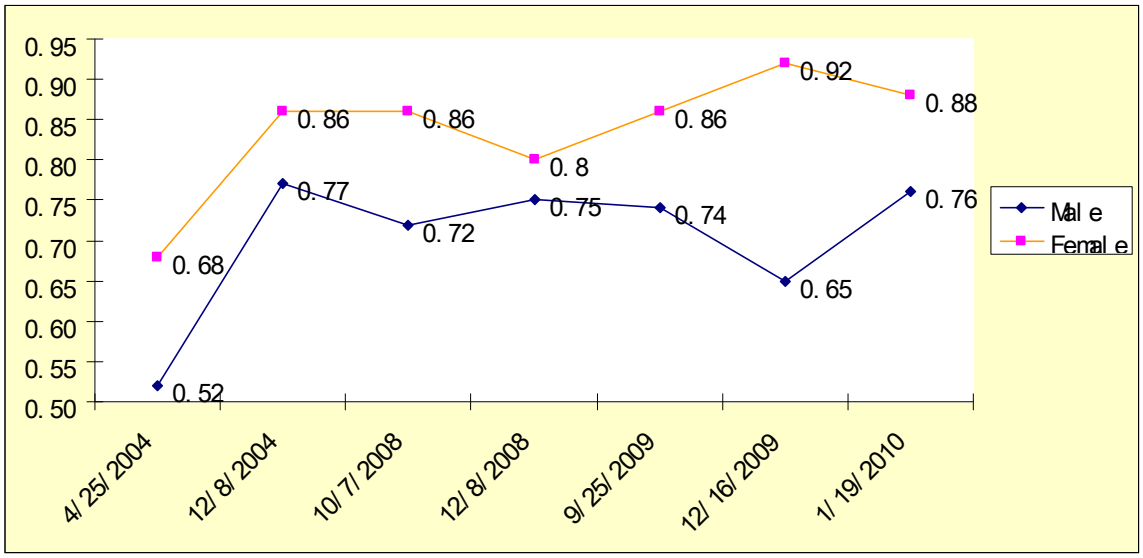
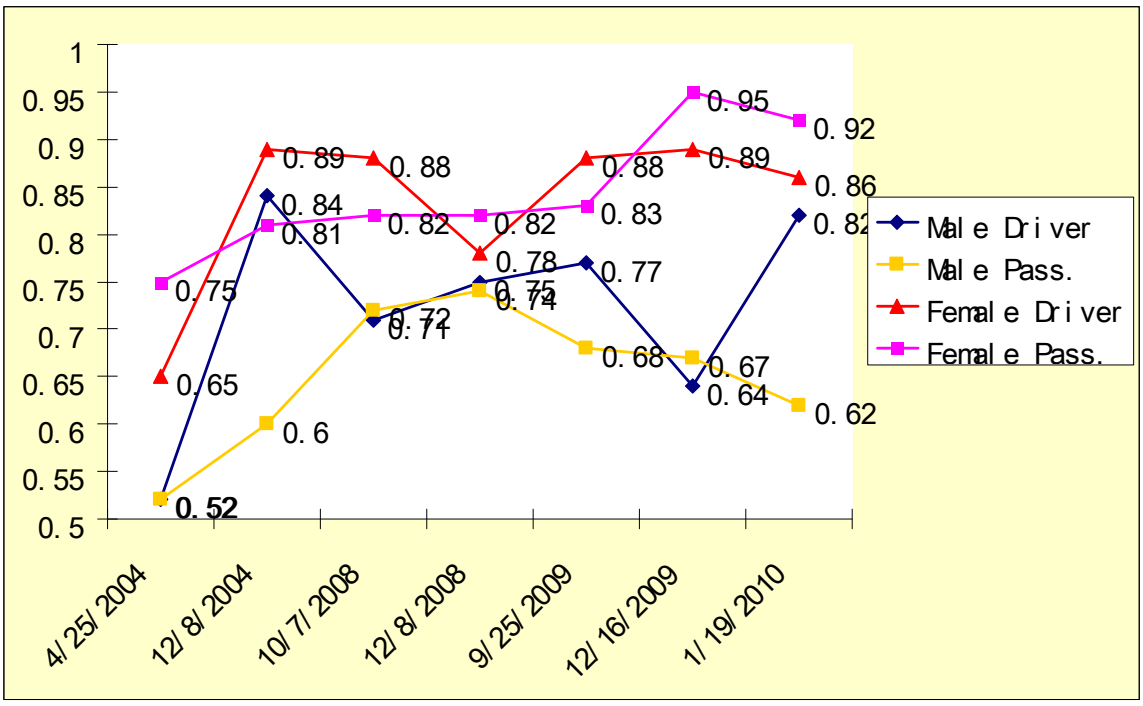


Table 2-c (Narragansett High School)

Narragansett High School				
	Male Driver	*Male Pass.*	*Female Driver*	*Female Pass.*
4/25/2004	0.52	0.52	0.65	0.75
12/8/2004	0.84	0.6	0.89	0.81
10/7/2008	0.71	0.72	0.88	0.82
12/8/2008	0.75	0.74	0.78	0.82
9/25/2009	0.77	0.68	0.88	0.83
12/16/2009*	0.64	0.67	0.89	0.95
1/19/2010	0.82	0.62	0.86	0.92

Figure 2-c (Narragansett High School)



[*note: 12/16/09 is afternoon observation]

Table 3-a (South Kingstown High School, 2004)

South Kingstown High Scholl (2004)			
Gender	*Yes*	*No*	*Total*
Female	0.75	0.25	283
Male	0.70	0.30	225
Total	0.73	0.27	508

Table 3-b (South Kingstown High School, 2008)

South Kingstown High Scholl (2008)			
Gender	*Yes*	*No*	*Total*
Female	*0.82*	*0.18*	*350*
Male	*0.69*	*0.31*	*293*
Total	*0.76*	*0.24*	*643*

Table 3-c (South Kingstown High School, 2004)

South Kingstown High Scholl (2004)			
Occupant Type	*Yes*	*No*	*Total*
Driver			
Female	*0.78*	*0.22*	*201*
Male	*0.72*	*0.28*	*138*
Passenger			
Female	*0.68*	*0.32*	*82*
Male	*0.67*	*0.33*	*87*

Table 3-d (South Kingstown High School, 2008)

South Kingstown High School (2008)			
Occupant Type	*Yes*	*No*	*Total*
Driver			
Female	0.86	0.14	245
Male	0.71	0.29	197
Passenger			
Female	0.82	0.18	105
Male	0.65	0.35	96

Table 4-a (3 Schools: Narragansett, South Kingstown, North Kingstown)

3 South County Schools Combined			
	Driver	*Passenger*	*All*
Male	*0.75*	*0.7*	*0.73*
Female	*0.86*	*0.8*	*0.84*

Figure 4-a (3 Schools: Narragansett, South Kingstown, North Kingstown)

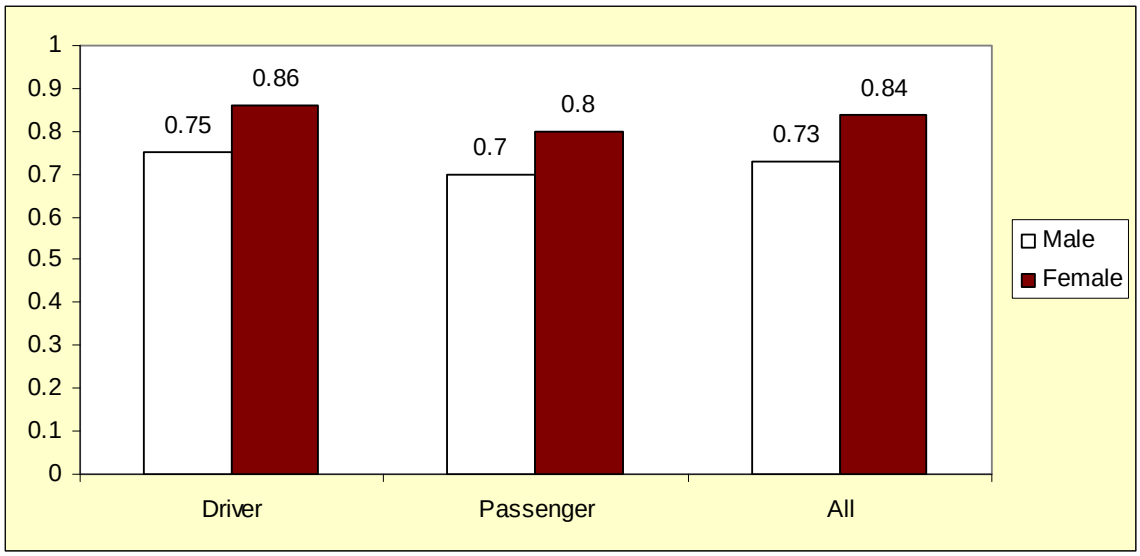


Table 4-b (3 Schools: Narragansett, South Kingstown, North Kingstown)

3 South County Schools Combined			
Gender	*Yes*	*No*	*Total*
Female	*0.84*	*0.16*	*829*
Male	*0.73*	*0.27*	*674*
Total	*0.79*	*0.21*	*1503*

Table 4-c (3 Schools: Narragansett, South Kingstown, North Kingstown)

3 South County Schools Combined			
Occupant Type	*Yes*	*No*	*Total*
Driver			
Female	0.86	0.14	546
Male	0.75	0.25	422
Passenger			
Female	0.8	0.2	283
Male	0.7	0.3	252

Table 4-d (3 Schools: Narragansett, South Kingstown, North Kingstown)

3 South County Schools Combined			
	Driver	*Passenger*	*All*
Auto	*0.82*	*0.77*	*0.8*
SUV	*0.82*	*0.71*	*0.78*
Van	*0.92*	*0.88*	*0.91*
PU	*0.6*	*0.62*	*0.61*

Figure 4-b (3 Schools: Narragansett, South Kingstown, North Kingstown)

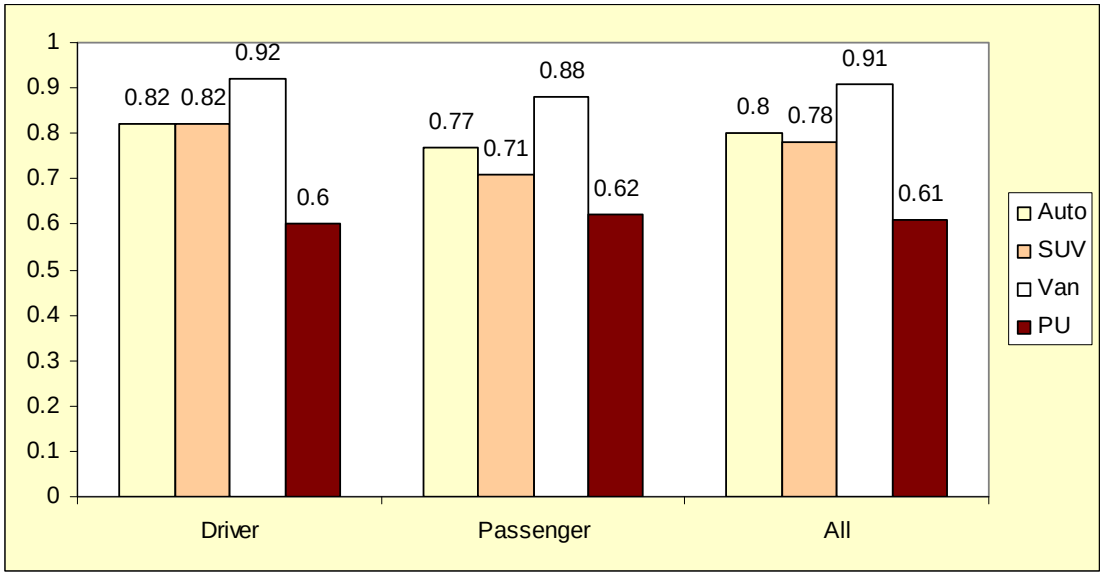


Table 4-e (3 Schools: Narragansett, South Kingstown, North Kingstown)

3 South County Schools Combined		
	Male	*Female*
Auto	*0.78*	*0.83*
SUV	*0.71*	*0.85*
Van	*0.86*	*0.95*
PU	*0.57*	*0.7*

Figure 4-c (3 Schools: Narragansett, South Kingstown, North Kingstown)

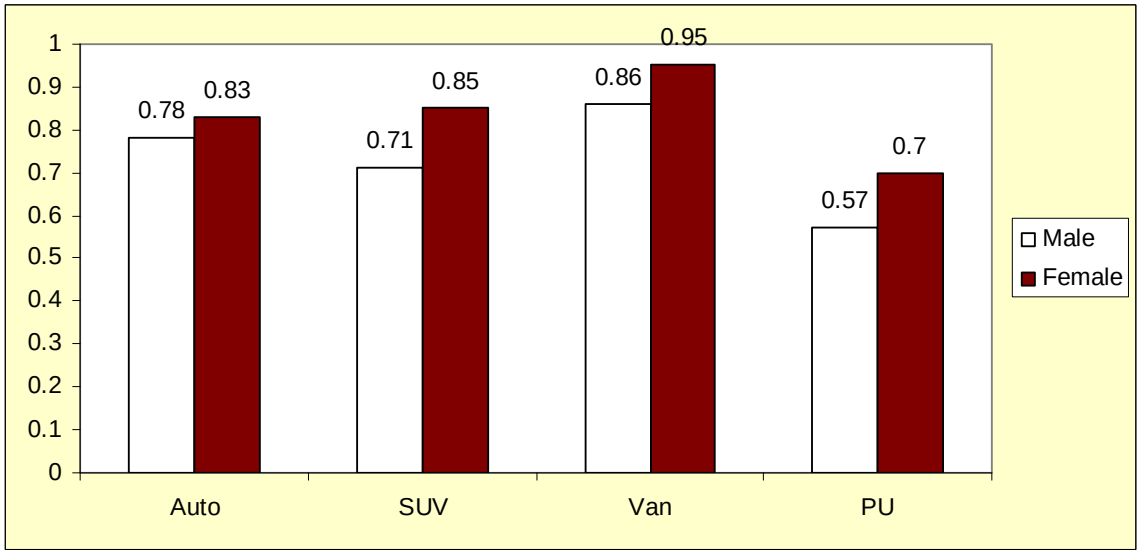


Table 5-a (Scituate High School)

Scituate High School		
	Driver	*Pass.*
4/25/2004	0.72	0.67
11/8/2008	0.78	0.66
4/20/2009	0.89	0.85

Figure 5-a (Scituate High School)

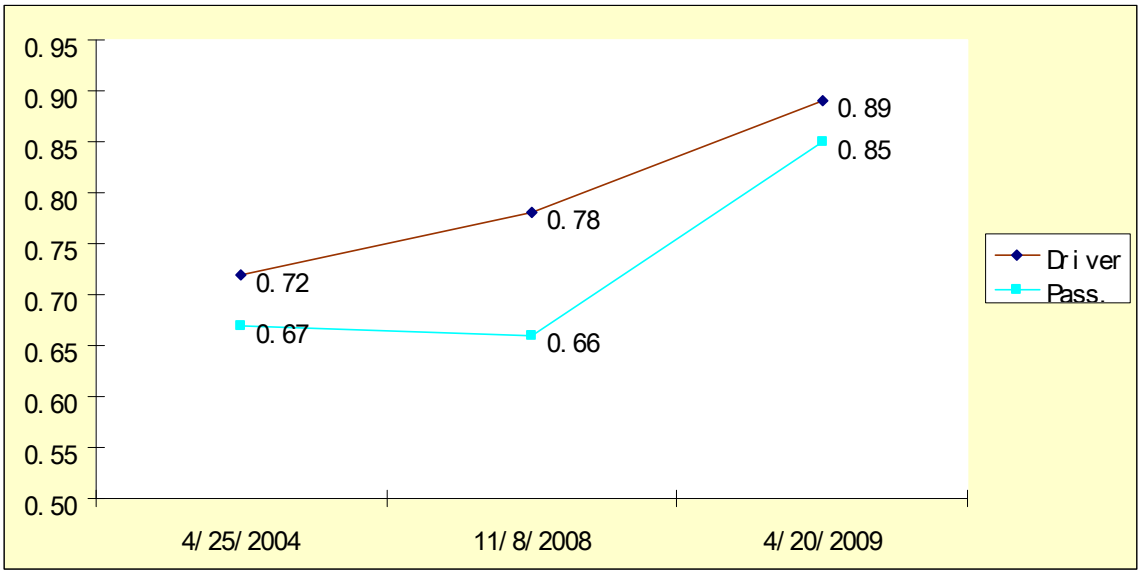


Table 5-b (Scituate High School)

Scituate High School		
	Male	*Female*
4/25/2004	0.64	0.74
11/8/2008	0.62	0.81
4/20/2009	0.84	0.9

Figure 5-b (Scituate High School)

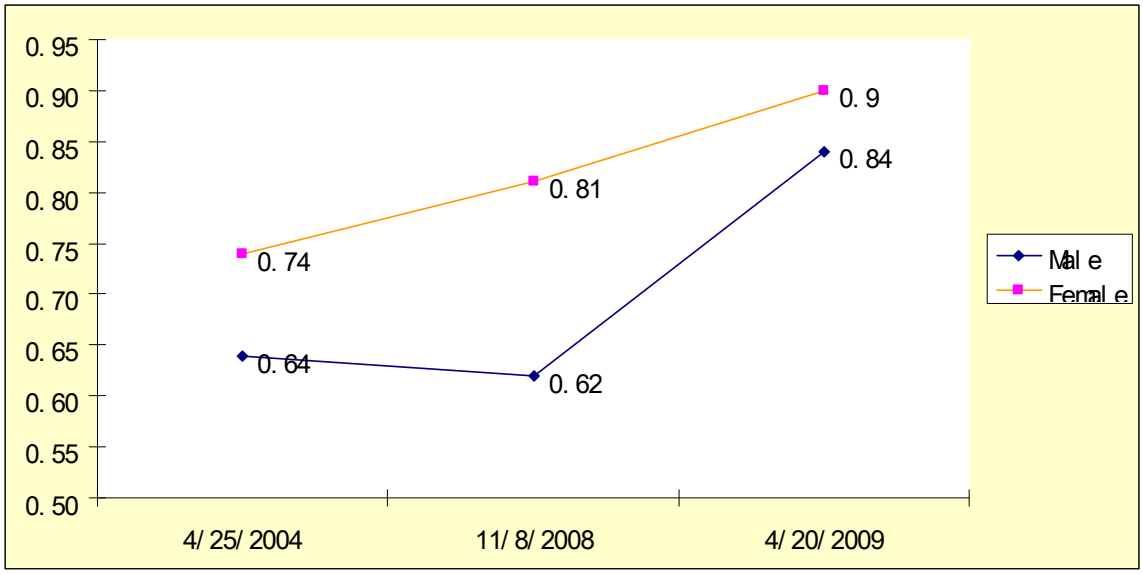
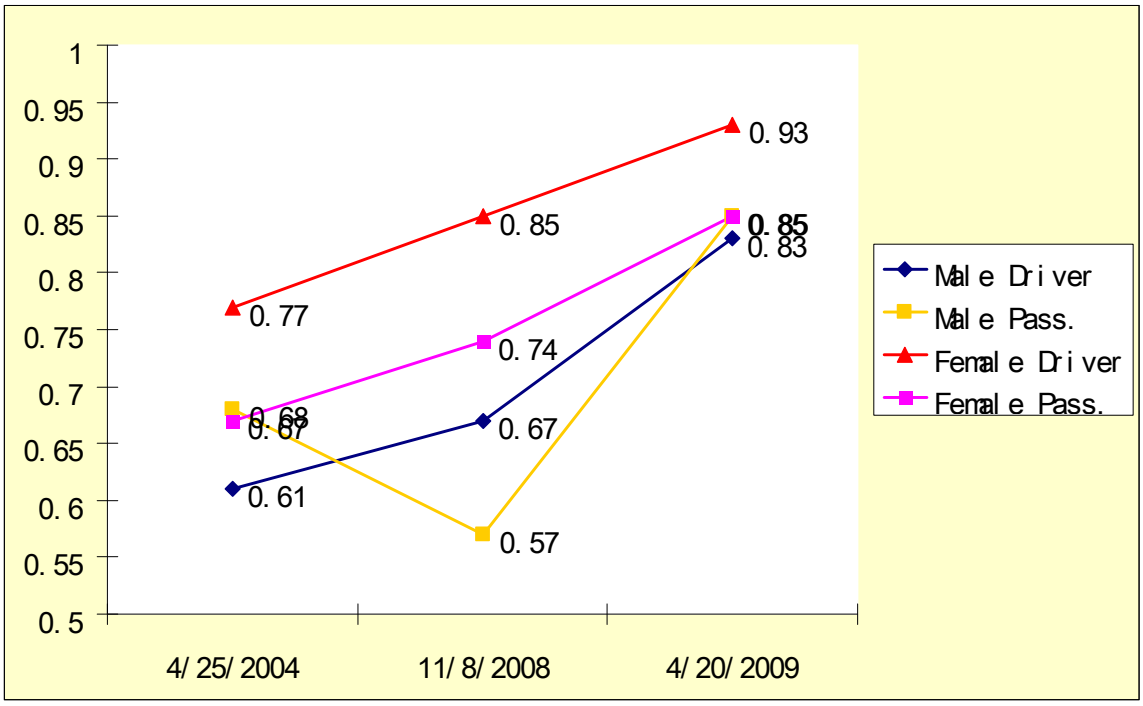


Table 5-c (Scituate High School)

Scituate High School				
	Male Driver	*Male Pass.*	*Female Driver*	*Female Pass.*
4/25/2004	0.61	0.68	0.77	0.67
11/8/2008	0.67	0.57	0.85	0.74
4/20/2009	0.83	0.85	0.93	0.85

Figure 5-c (Scituate High School)



APPENDIX A

Data Entry and Analysis.

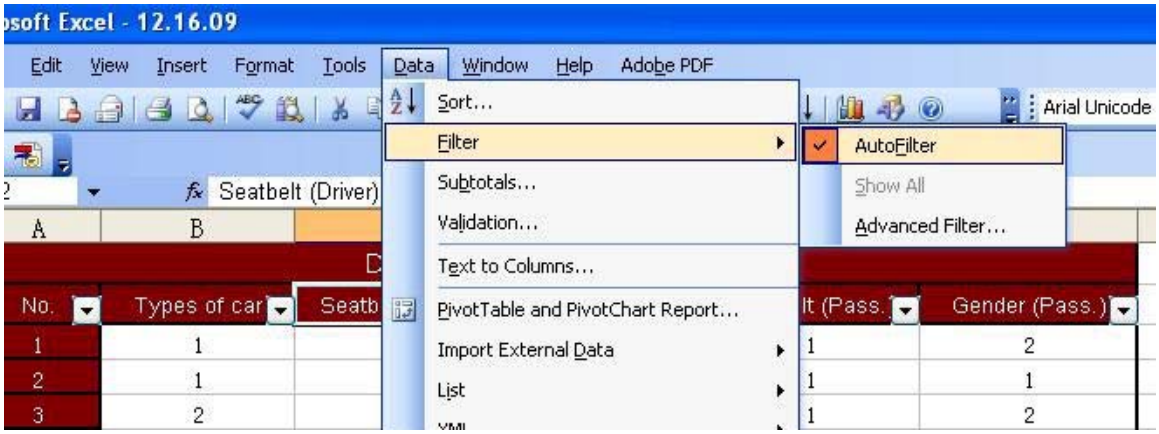
After collecting all the observation sheets, data entry and further analysis are required. Thanks the computer based software, such as Microsoft Office, students, teachers, student group advisors and administrators can easily complete this session.

Microsoft Office Excel is recommended for both the data entry and analysis. The types of vehicles can be labeled as 1 (Auto), 2 (SUV), 3 (Van), and 4 (PU); similarly the gender can be labeled ***1*** for male and ***2*** for female, seatbelt status as ***1*** for yes and ***2*** for no. Enter the data from the observation sheet, and you will have a table like this:

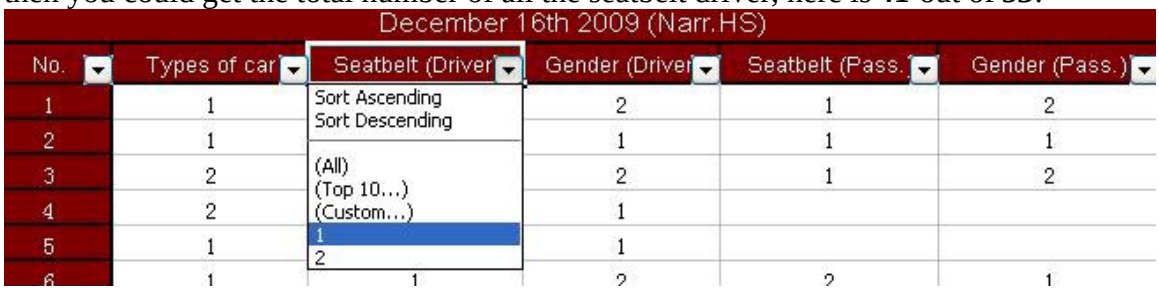
December 16th 2009 (Narragansett High School)					
No.	Types of car	Seatbelt (Driver)	Gender (Driver)	Seatbelt (Pass.)	Gender (Pass.)
1	1	1	2	1	2
2	1	1	1	1	1
3	2	1	2	1	2

After completing the data entry, simply use the filter option to get the specific data. For example, calculate the ratio of seatbelt male driver, you can filter all the "***1***" result out of the "Gender (Driver)", you get the number let's say "y"; then you continue to filter all the "1" results out of the "Seatbelt Driver" based on the result that you already did, you can get the total number of all the seatbelt male driver let's say "x"; finally you calculate the ratio by the formation "seatbelt male driver = x ÷ y". Please read the details as bellowed:

Instruction: Click the tabs that you want to filter, e.g. "Types of car", then you click the "data" to select the "filter option". A small downward arrow will appear at the tabs that you just selected.



Click the downward arrow, and select what kind of data you want to filter. For example, if you want to filter all the seatbelt drivers, click ***1*** (which is labeled ***yes***) for filtering, then you could get the total number of all the seatbelt driver, here is ***41*** out of ***53***.



After getting all the data you want, type the formations into the table to organize all the results; it would be convenient for your creating the graphs later. For example, we can get the ratio of seatbelt driver = 41 ÷ 53 = 0.77.

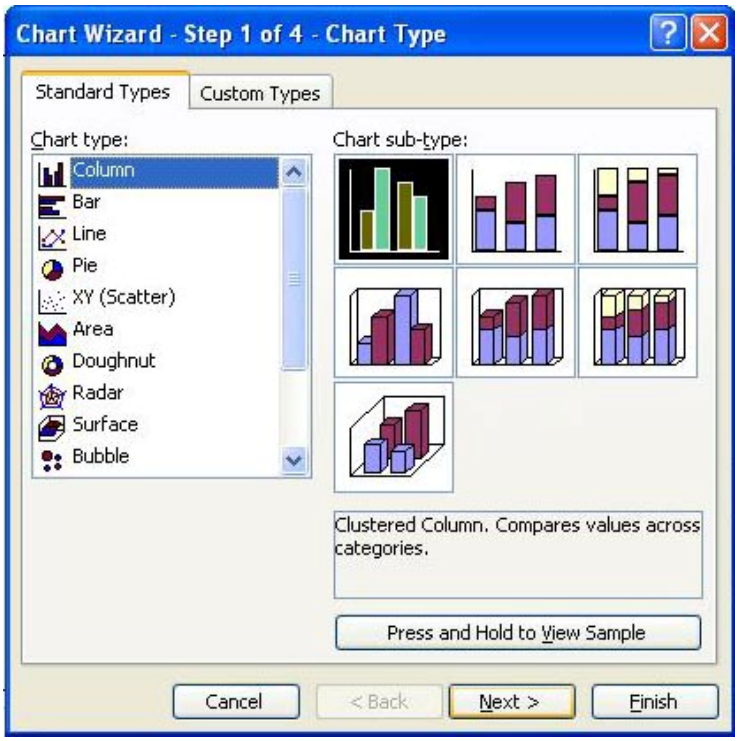
By this simple method, you can filter and calculate out all the ratios that you want. You can put all the ratios into a table to compare, for example see bellowed:

1	Ratio of Seatbelt Driver
	SeatbeltDriver/Driver=41/53=0.77
2	Ratio of Seatbelt Pass.
	SeatbeltPass./Pass.=29/35=0.83
3	Ratio of All Persons
	SeatbeltPersons/All=70/88=0.80
4	Ratio of Male Driver
	SeatbeltMaleDriver/MaleDriver=16/25=0.64
5	Ratio of Male Pass.
	SeatbeltMalePass./MalePass.=10/15=0.67
6	Ratio of All Male
	SeatbeltMale/Male=26/40=0.65
7	Ratio of Female Driver
	SeatbeltFeDriver/FeDriver=25/28=0.89
8	Ratio of Female Pass.
	SeatbeltFePass./FePass.=19/20=0.95
9	Ratio of All Female
	SeatbeltFemale/Female=44/48=0.92

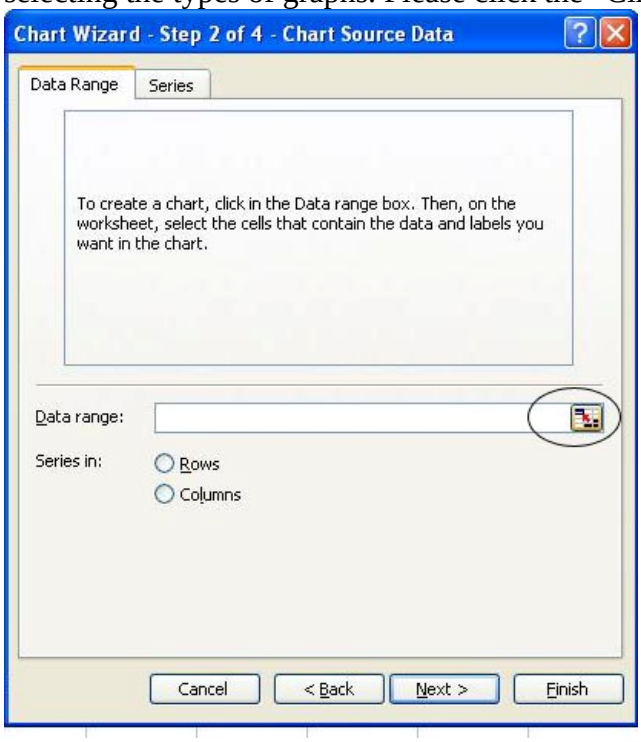
You can also put all the data into a graph to have a direct visual comparing effect, we can also take the data above as an example, please see bellowed:

Step 1: Click the “Chart Wizard” button at the top of the Excel.

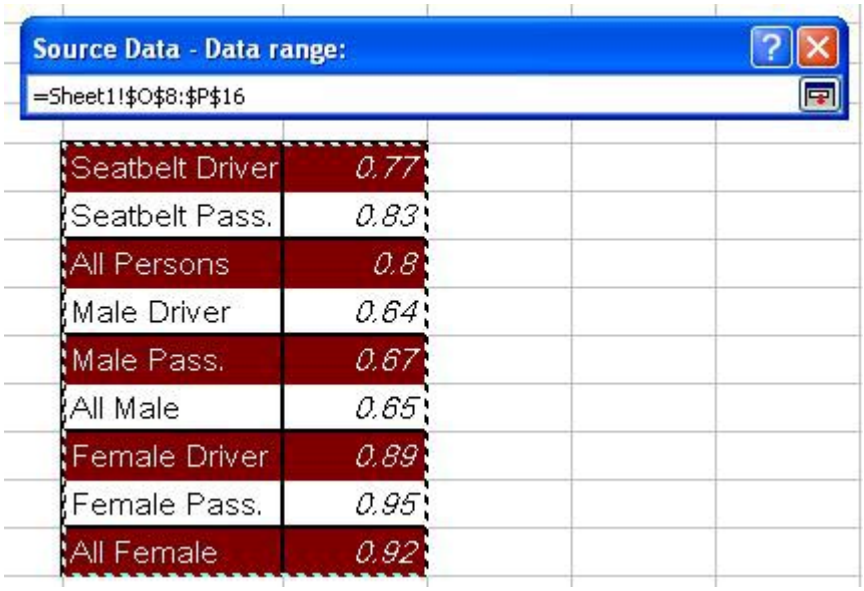
Step 2: It will pop out another window after you clicking the “Chart Wizard” button for you to select the types of graphs you want. You can choose one of the standard types and click “Next”.



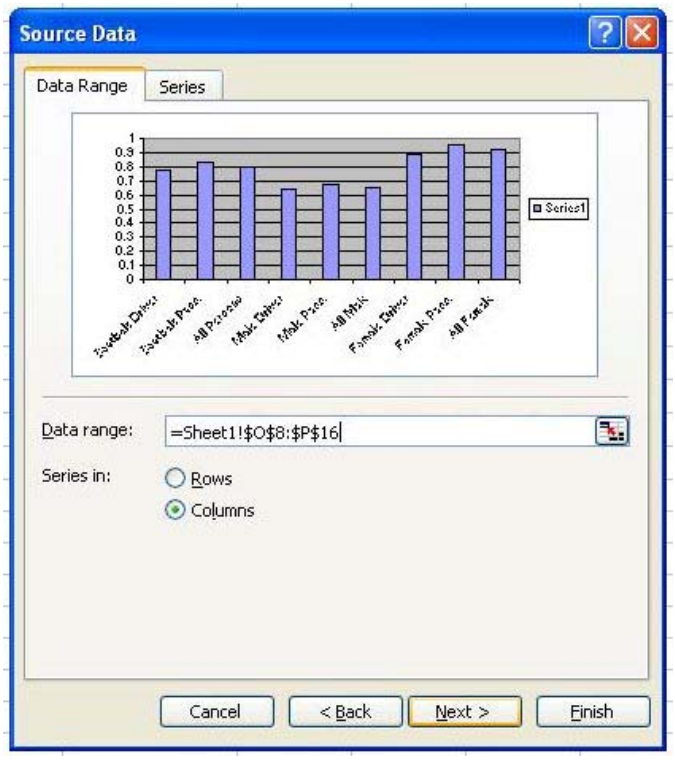
Step 3: You will be guided to choose the data range at this step after you finishing selecting the types of graphs. Please click the “Circling” button.



Step 4: You will be guided to the data tables that you just created by yourself. It is recommended that after finishing calculating the ratios, you create another small simple table for the convenience of creating the graphs. Circle that specific small table including the titles and the numbers.

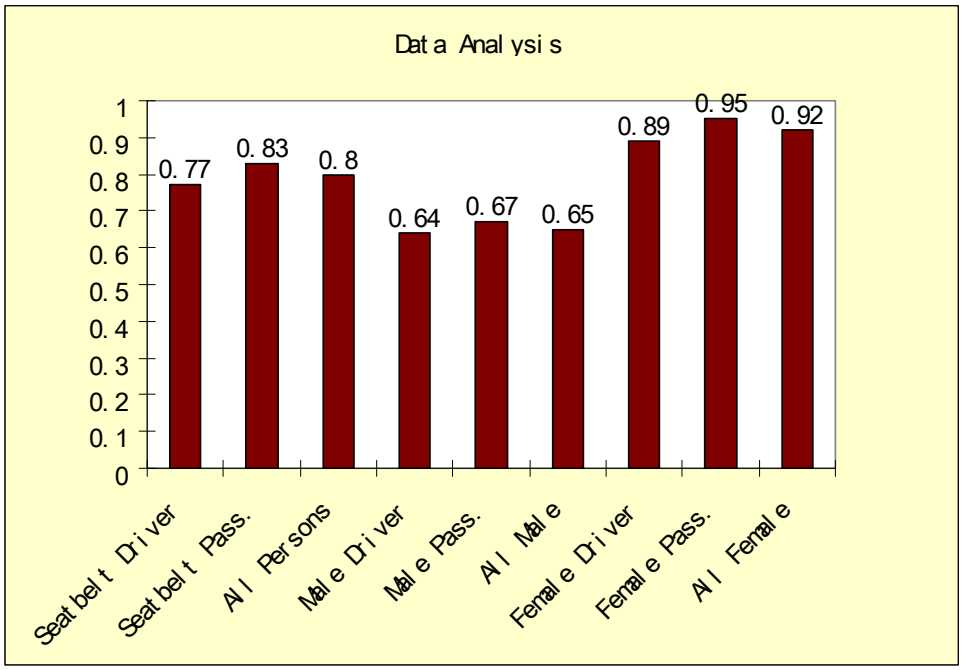


Step 5: After doing this, the draft of a graph will pop out in a small window. Click "Finish" button, then you will get a graph that includes all the data you want.



You can also click "Next" to customize the graphs that you want them to be, such as the colors, the digits, the titles.

Finally you will get a analysis graph as shown below:



You can also take the data that you are interested in to do the comparison analysis separately, for example if you are interested in comparing the female driver and male driver, or female passenger and male passenger, or female and male, you can only take some of the result out of the graph above to create a small and clear graph: