

Safety Ambassador Program Results 2013-2014

The findings for the 2013-2014 academic year are outlined below. There were four levels of evaluation: a) pre and post safety knowledge scores for elementary school students, b) pre and post scores for high school student safety knowledge, c) high school student presentation evaluations over-time, and d) assessment of behavior specific responses in pre and post scores for elementary school students. Each level is discussed followed by the results. This is the second year of the five-year longitudinal study, therefore the reports also includes a comparison of the results to previous academic years.

Pre and Post Safety Knowledge Scores for Elementary School Students

All participating elementary schools were recruited from Middlesex County, NJ. The pre and post evaluation consisted of first and second graders filling out a Yes/No answer sheet as they were presented with a series of visual safety questions, prior to viewing four different safety presentations conducted by trained high school students. Following the completion of the four safety presentations, which were conducted over the course of four months, the first and second graders were presented with the same answer sheet and safety questions to assess a change in safety knowledge. To examine individual responses from the pre and post test of the 2013-2014 cohort ($N = 1235$) we ran a paired samples t-test to see if the safety presentations made a difference in student responses. Results of the t-test are displayed below:

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Ped2WalkT1	1.603	1235	.5789	.0165
	Ped2WalkT2	1.113	1235	.9416	.0268
Pair 2	ChildAlo2eT1	1.783	1235	.5170	.0147
	ChildAlo2eT2	1.189	1235	.9700	.0276
Pair 3	Bic1cleT1	1.395	1235	.5897	.0168
	Bic1cleT2	1.028	1235	.9025	.0257
Pair 4	Jumpi2gBedT1	1.864	1235	.4493	.0128
	Jumpi2gBedT2	1.200	1235	.9744	.0277
Pair 5	Pla1Drivewa1T1	1.804	1235	.4984	.0142
	Pla1Drivewa1T2	1.194	1235	.9726	.0277
Pair 6	BeSafeSee2T1	1.065	1235	.3994	.0114
	BeSafeSee2T2	.628	1235	.5329	.0152
Pair 7	Bo1Drivi2gT1	1.858	1235	.4521	.0129
	Bo1Drivi2gT2	1.190	1235	.9713	.0276

Pair 8	PedCrosswalkT1	1.198	1235	.4698	.0134
	PedCrosswalkT2	.826	1235	.7679	.0218
Pair 9	Swi2gSafet1T1	1.845	1235	.4423	.0126
	Swi2gSafet1T2	1.188	1235	.9731	.0277
Pair 10	PedFaceTrafficT1	1.423	1235	.5731	.0163
	PedFaceTrafficT2	.854	1235	.7908	.0225
Pair 11	KidClimbT1	1.793	1235	.4839	.0138
	KidClimbT2	1.168	1235	.9663	.0275
Pair 12	BoosterSeatT1	1.039	1235	.3272	.0093
	BoosterSeatT2	.629	1235	.5402	.0154

Based on the results of the t-test there were some questions with marked difference in averages between time 1 and time 2 responses. Questions with the most difference are in bold. To further demonstrate the response differences between pre and post test, the following significance results are listed below with $p < .05$ as the threshold for significance:

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Ped2WalkT1 - Ped2WalkT2	.4899	1.0139	.0289	.4333	.5465	16.979	1234	.000
Pair 2	ChildAlo2eT1 - ChildAlo2eT2	.5943	1.0505	.0299	.5357	.6530	19.882	1234	.000
Pair 3	Bic1cleT1 - Bic1cleT2	.3676	1.0260	.0292	.3103	.4249	12.591	1234	.000
Pair 4	Jumpi2gBedT1 - Jumpi2gBedT2	.6640	1.0238	.0291	.6068	.7211	22.790	1234	.000
Pair 5	Pla1Drivewa1T1 - Pla1Drivewa1T2	.6097	1.0412	.0296	.5516	.6678	20.578	1234	.000
Pair 6	BeSafeSee2T1 - BeSafeSee2T2	.4364	.6452	.0184	.4004	.4725	23.770	1234	.000
Pair 7	Bo1Drivi2gT1 - Bo1Drivi2gT2	.6680	1.0224	.0291	.6109	.7251	22.962	1234	.000

Pair 8	PedCrosswalkT1 -	.3725	.9077	.0258	.3218	.4231	14.421	1234	.000
Pair 9	PedCrosswalkT2 Swi2gSafet1T1 - Swi2gSafet1T2	.6575	1.0351	.0295	.5997	.7153	22.323	1234	.000
Pair 10	PedFaceTrafficT1 - PedFaceTrafficT2	.5684	.9658	.0275	.5145	.6223	20.684	1234	.000
Pair 11	KidClimbT1 - KidClimbT2	.6251	1.0534	.0300	.5663	.6839	20.853	1234	.000
Pair 12	BoosterSeatT1 - BoosterSeatT2	.4097	.6123	.0174	.3755	.4439	23.514	1234	.000

From the Sig. column, in bold, we can see that the difference between time 1 and time 2 for each safety knowledge question is significant.

We then wanted to examine scores for Safety Knowledge between time 1 and time 2 for both 1st and 2nd grade students. Of the first grade students ($N = 527$), only 2.1% answered all questions correctly, 12 out of 12 questions, on the pre-test ($M = 8.39$, $SD = 1.89$). For the post-test, first grade students showed improved scores with 12.7% answering all questions correct ($M = 10$, $SD = 1.64$). Scores increased from time 1 to time 2 by 13.43%. Among the second grade students ($N = 121$), 3.3% answered all questions correctly at time 1 ($M = 8.90$, $SD = 1.70$). For the post-test, second grade students improved their overall scores with 6.6% answering all 12 questions correctly ($M = 9.74$, $SD = 1.30$). The second grade students demonstrated a 7.02% increase from time 1 to time 2. After running a paired samples t-test, both first and second grade scores between pre-test and post-test had a significance level of $p < .001$. Collectively, there was a 12.23% increase from pre-test to post-test.

Last years results for the elementary school scores were reported using combined students' scores per class. Of the 18 elementary schools participating in the 2012-2013 program, ten schools returned the pre-test for 41 first grade classes. Scores were combined for each school and across all first grade responses ($M = 72\%$). A total of nine schools returned the pre-test responses for 32 second grade classes. Scores were combined for each school and then across all second grade responses ($M = 78\%$). Six elementary schools completed the post-test evaluation. Of the first grade classes, there was a 13% increase in reported safety knowledge ($M = 82\%$). Among second grade classes, there was also a 13% increase in reported safety knowledge following the four safety presentations ($M = 88\%$). Only two schools returned both pre and post evaluations. To provide a clear assessment of knowledge growth, we compared the pre and post test results of the two schools that completed both tests. Six first grade classes, with approximately 78 student responses, demonstrated a knowledge gain of 19% between pre and post exams. Of the 3 second grade classes, with approximately 50 students, who returned both pre and post evaluations there was a 22% gain in safety knowledge.

Pre and Post Scores for High School Students Safety Knowledge

There were 22 high schools from Middlesex County that participated in the Safety Ambassador program during the 2013-2014 school year. Students were selected from each high school to present safety information to elementary school students on four distinct safety topics: 1) safety in and around cars, 2) falls prevention, 3) pedestrian safety, and 4) wheeled sports. Below is a detailed description of each test time and the breakdown of information for each question. The *M* symbol signifies the mean of the item, how most students responded to the question. The *SD* symbol refers to the standard deviation, the extent to which students deviated from the mean. To further understand the deviation we have provided the variance to express the extent of the distance. The higher the variance, the more disagreement among students. Items where students had the highest amount of disagreement are in bold. When responding to the scaled questions students answered on a 5-point scale (1 = *Strongly Agree*, 5 = *Strongly Disagree*).

Time 1 – Pre Test

Of the students who participated (N = 210) they reported the following for each item:

Unintentional Injury (*M* = 1.04, *SD* = .20, variance = .04)

Pedestrian Rules (*M* = 3.87, *SD* = .44, variance = .19)

Seatbelt (*M* = 4.79, *SD* = .64, variance = .42)

Back Seat 13 (*M* = 2.97, *SD* = .29, variance = .08)

Lead Death (*M* = 2.04, *SD* = .41, variance = .17)

Traffic Restrain (*M* = 1.07, *SD* = .25, variance = .06)

Helmet Law (*M* = 3.61, *SD* = .78, variance = .62)

Airbag Seatbelt (*M* = 1.98, *SD* = .13, variance = .01)

Booster (*M* = 3.68, *SD* = 1.86, variance = 3.48)

Playground Rules (*M* = 3.97, *SD* = .20, variance = .04)

Pedestrian Define (*M* = 3.77, *SD* = .41, variance = .17)

Wheel Slogan (*M* = 3.88, *SD* = .52, variance = .27)

NJ License (*M* = 3.86, *SD* = .59, variance = .35)

Prevent Fall (*M* = 2.76, *SD* = .64, variance = .42)

RWJ Trauma 1 (*M* = 3.83, *SD* = .54, variance = .29)

Passenger Influence (*M* = 4.59, *SD* = .96, variance = .93)

Seatbelt Frequency (*M* = 4.38, *SD* = 1.38, variance = 1.91)

Safe Driver (*M* = 2.36, *SD* = 1.85, variance = 3.43)

Time 2 – Post Test 1

Of the students who participated (N = 209) they reported the following for each item:

Unintentional Injury (*M* = 1.04, *SD* = .26, variance = .07)

Pedestrian Rules (*M* = 3.85, *SD* = .64, variance = .41)

Seatbelt (*M* = 4.82, *SD* = .73, variance = .53)

Back Seat 13 (*M* = 3.00, *SD* = .28, variance = .08)

Lead Death (*M* = 2.01, *SD* = .25, variance = .06)

Traffic Restrain (*M* = 1.02, *SD* = .15, variance = .02)

Helmet Law (*M* = 2.71, *SD* = .94, variance = .89)

Airbag Seatbelt (*M* = 1.96, *SD* = .18, variance = .03)

Booster (*M* = 3.73, *SD* = 1.83, variance = 3.36)

Playground Rules (*M* = 3.95, *SD* = .36, variance = .13)

Pedestrian Define ($M = 3.53$, $SD = .51$, variance = .26)
Wheel Slogan ($M = 3.89$, $SD = .47$, variance = .22)
NJ License ($M = 3.79$, $SD = .72$, variance = .52)
Prevent Fall ($M = 2.95$, $SD = .34$, variance = .12)
RWJ Trauma 1 ($M = 3.77$, $SD = .59$, variance = .35)
Passenger Influence ($M = 4.70$, $SD = .87$, variance = .77)
Seatbelt Frequency ($M = 4.51$, $SD = 1.24$, variance = 1.55)
Safe Driver ($M = 2.43$, $SD = 1.93$, variance = 3.74)

Time 3 – Post Test 2

Of the students who participated ($N = 144$) they reported the following for each item:

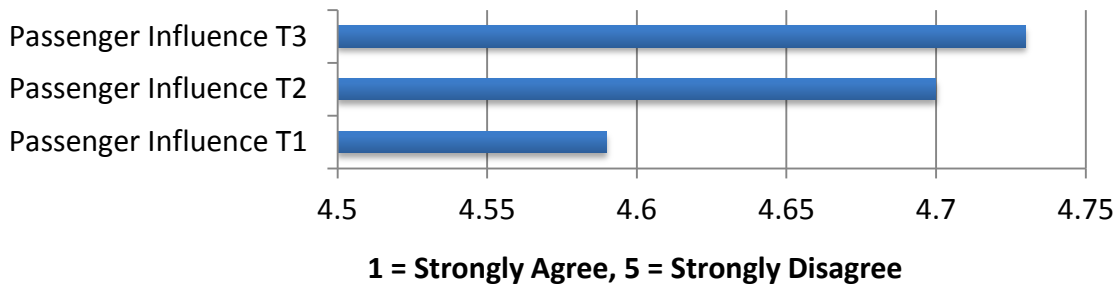
Unintentional Injury ($M = 1.04$, $SD = .21$, variance = .04)
Pedestrian Rules ($M = 3.90$, $SD = .43$, variance = .18)
Seatbelt ($M = 4.86$, $SD = .41$, variance = .17)
Back Seat 13 ($M = 2.97$, $SD = .30$, variance = .09)
Lead Death ($M = 2.10$, $SD = .36$, variance = .13)
Traffic Restrain ($M = 1.02$, $SD = .26$, variance = .07)
Helmet Law ($M = 3.35$, $SD = .97$, variance = .95)
Airbag Seatbelt ($M = 1.97$, $SD = .14$, variance = .02)
Booster ($M = 3.92$, $SD = 1.73$, variance = 2.99)
Playground Rules ($M = 3.99$, $SD = .08$, variance = .00)
Pedestrian Define ($M = 3.62$, $SD = .52$, variance = .27)
Wheel Slogan ($M = 3.81$, $SD = .66$, variance = .44)
NJ License ($M = 3.84$, $SD = .58$, variance = .34)
Prevent Fall ($M = 2.78$, $SD = .63$, variance = .39)
RWJ Trauma 1 ($M = 3.81$, $SD = .56$, variance = .31)
Passenger Influence ($M = 4.73$, $SD = .85$, variance = .72)
Seatbelt Frequency ($M = 4.58$, $SD = 1.17$, variance = 1.39)
Safe Driver ($M = 2.02$, $SD = 1.67$, variance = 2.79)

Students seemed to have the most disagreement on the Booster question and the last two scaled questions. For the most part, variance regarding each question decreased over time with the exception of the Safe Driver question, which actually went up during the second test (Post1). There are two possible explanations for the Booster item results. It is possible that during the safety training students did not clearly understand the criteria for using a booster seat or the item itself is not worded clearly. The responses to the Seatbelt Frequency (scaled) question suggest that students vary in terms of seatbelt use or the response options do not accurately describe seatbelt use. The Safe Driver results fluctuate but not drastically. It is possible that students driving experience over the four month timeframe made them feel inclined to believe they were safer drivers than the first day of tests.

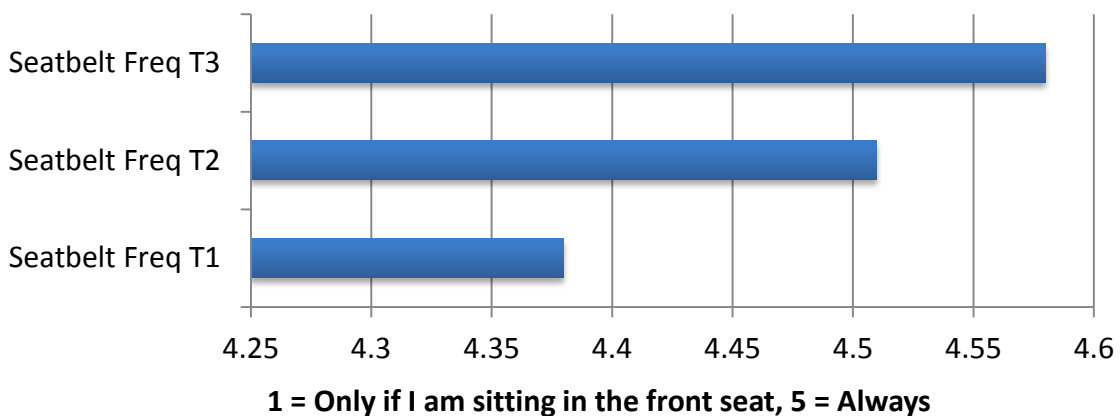
Comparison of Time Points for the 2013-2014 Scaled Questions

Bar charts were developed to further illustrate the differences across time points for the scaled questions regarding Safe Driver and Passenger Intoxication. Overall these findings suggest that the topics that speak to these two questions may require further attention in the Safety Ambassador training program.

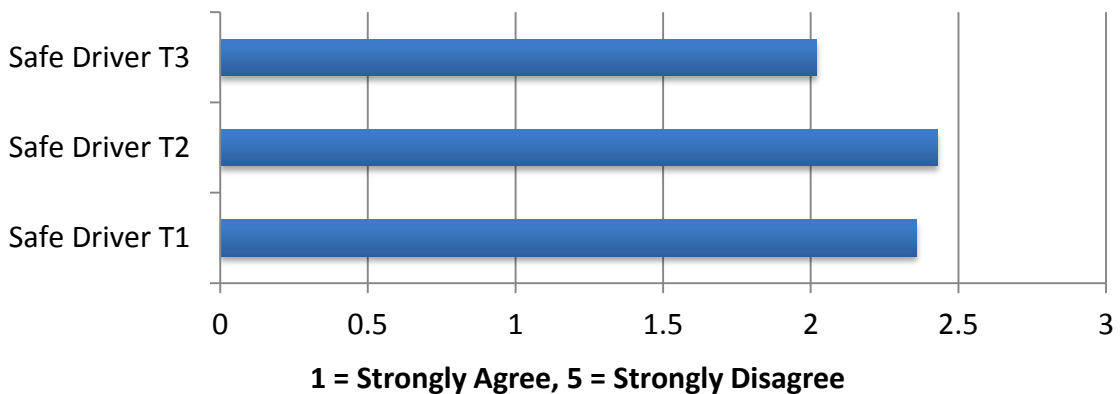
"In a pinch, I would consider being a passenger in a car being driven by someone who is under the influence of drugs/alcohol"



"I wear my seatbelt when travelling in a car"



"I consider myself to be a safe driver"*



*Students who are not driving yet are not included in this chart

A final analysis was conducted to examine gender differences in response to these two scaled questions. Using gender as the independent variable and SafeDriver/PassengerIntox as the two dependent variables a test of statistical differences was conducted. The analysis confirmed no significant difference between male and female responses to the two scaled questions at all three time points.

Comparing Pre & Post-Test Responses of 2012-2013 Cohort to 2013-2014 Cohort

An analysis was conducted to examine the test scores across time points. A within-subjects repeated measures analysis of variance (ANOVA) was conducted to assess how scores changed over time. Results of the ANOVA display the significant differences between each test at $p < .05$:

Pairwise Comparisons

Measure: MEASURE_1

(I) Test	(J) Test	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
1	2	-1.015*	.139	.000	-1.352	-.678
	3	-.273	.140	.160	-.612	.066
2	1	1.015*	.139	.000	.678	1.352
	3	.742*	.128	.000	.432	1.053
3	1	.273	.140	.160	-.066	.612
	2	-.742*	.128	.000	-1.053	-.432

Based on estimated marginal means

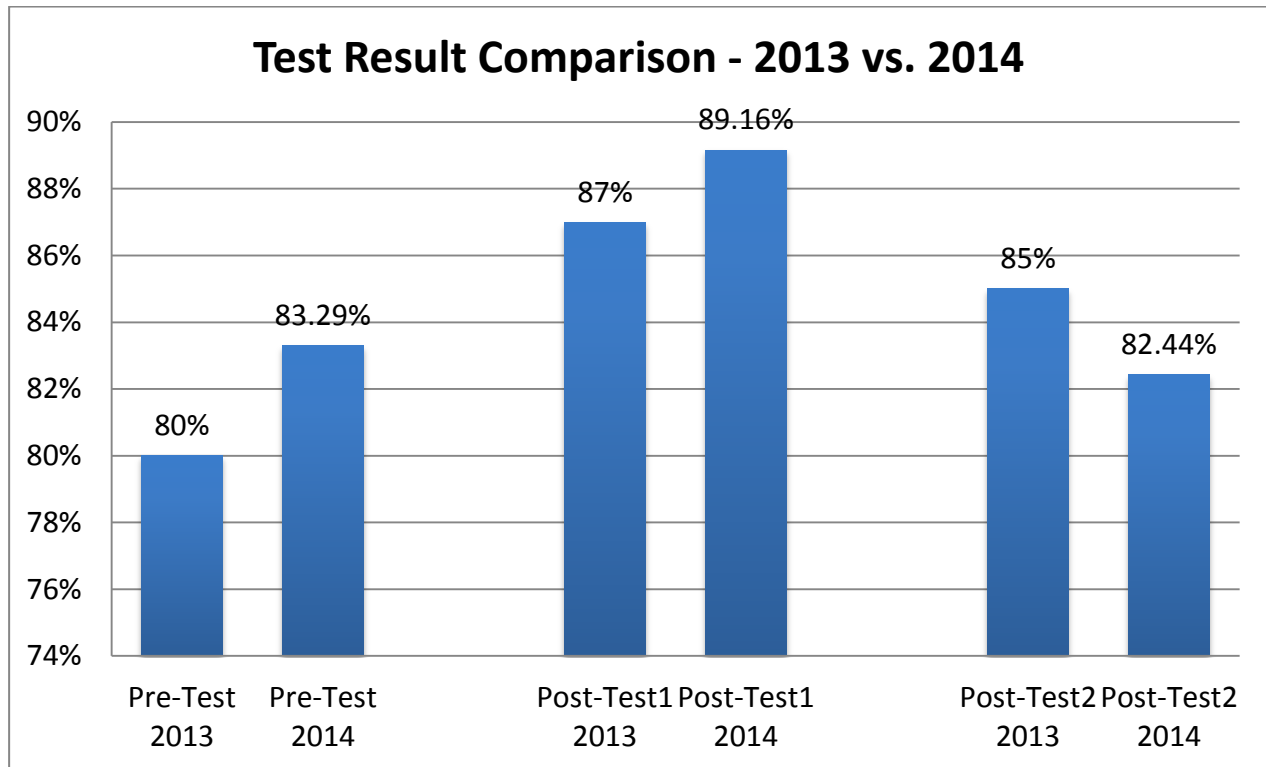
*. The mean difference is significant at the

b. Adjustment for multiple comparisons: Bonferroni.

In the Mean Difference column, bold, we can see the denotation of significance by the *. The table illustrates that there was a significant difference between the pre-test and post-test 1 but not post-test 2. The first post-test results were significantly different from responses in both pre-test and post-test 2. Finally, the post-test 2 only had a significant level of difference with post-test 2. These findings suggest that each stage of testing had a significant level of change and whether it be an increase in score or decrease in score. The next paragraph discusses the percentage of change at each time point and compares to the 2012-2013 results.

The correct answers to the pre-test, post-test 1, and post-test 2 of the 2013–2014 cohort were slightly improved compared to the results of the 2012-2013 cohort. Last years pre-test scores ($M = 80\%$) were slightly lower when compared to pre-test results from this year ($M = 83.29\%$). The results of the first post-test, distributed immediately following a day of safety training, for the 2013-2014 cohort ($M = 89.16\%$) was also slightly higher when comparing to the first post-test results of last years cohort ($M = 87\%$). Following the four months of safety presentations, students were then asked to complete a final post-test. The second post-test was completed at the end of the year Recognition Event in June, again completed by all participating high school students. For this test, last years cohort had a higher average

score ($M = 85\%$) than the 2013-2014 cohort post-test 2 results (82.44%). There are several possible reasons for this notable decline. Students may have taken the test less seriously given that it was the end of their involvement in the Safety Ambassador program. Other possible reasons are the design of the test questions and the environment in which the post-test 2 is distributed. We plan to examine each of these possibilities and locate ways to improve safety information retention. Overall, we are pleased with the general increase in test results and look forward to making comparisons over a three-year period with data from the 2014-2015 cohort. Below is a graph depicting the difference between cohort test results.



High School Student Presentation Evaluations Over-time

Each presentation conducted by the high school students was evaluated by volunteers and teachers based on presentation skills and safety messages. Evaluations from volunteers were collected after each presentation via an online survey. High school students were given feedback from their evaluators following each presentation. Collectively, we examined the overall evaluation results to compare any changes between the first month of presentations, February, and the last month of presentations, May. We expected the evaluations for the first month of safety messages to be substantial since the students had recently been trained however, we also anticipated that high school students would be adjusting to the public speaking dynamic. Presentation Skills were scored on a 5-point scale (1 = Strongly Agree, 5 = Strongly Disagree). The first month results are listed below by presentation topic:

Safety In and Around Cars - Safety Messages ($M = 37.57$), out of a possible 40 (93%)
 Presentation Skill ($M = 1.32$, $SD = .62$), on a 5-point scale

Pedestrian Safety – Safety Messages ($M = 34.14$) out of a possible 43 (79%)
Presentation Skill ($M = 1.40$, $SD = .55$), on a 5-point scale

Falls Prevention - Safety Messages ($M = 36.4$) out of a possible 42 (86%)
Presentation Skill ($M = 1.28$, $SD = .49$), on a 5-point scale

Wheeled Sports - Safety Messages ($M = 33.5$) out of a possible 37 (90%)
Presentation Skill ($M = 1.18$, $SD = .46$), on a 5-point scale

In comparison, the final month of results demonstrates an increase in safety message efficiency but a similar total for presentation skills between the first month and fourth month.

Safety In and Around Cars – Safety Messages ($M = 18$) out of a possible 19 (94%)
Presentation Skill ($M = 1.42$, $SD = .62$), on a 5-point scale

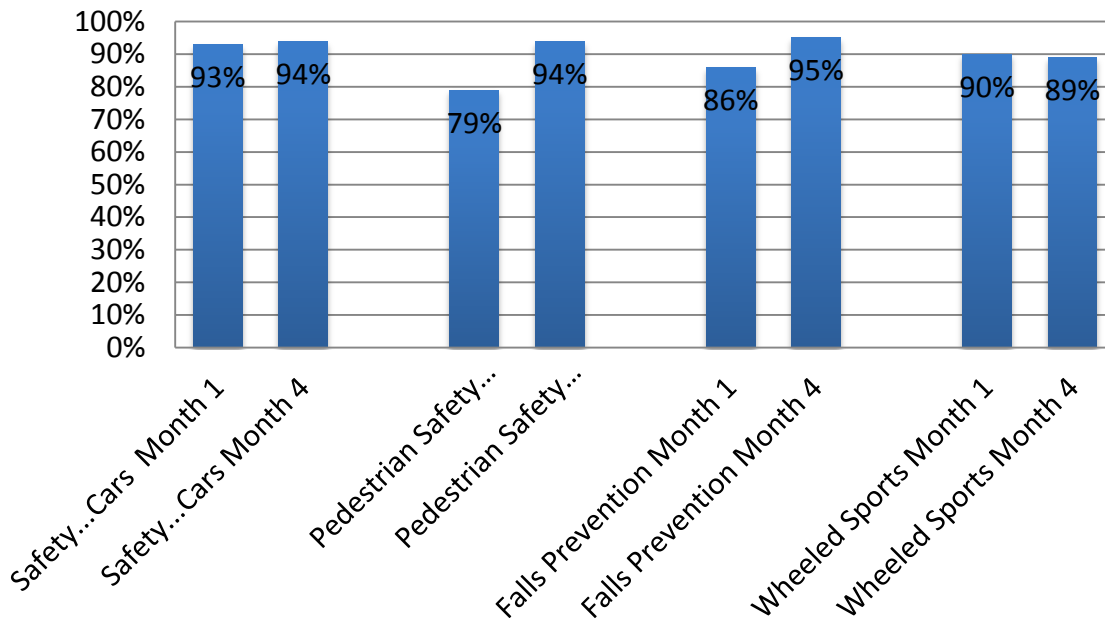
Pedestrian Safety – Safety Messages ($M = 31.14$) out of a possible 33 (94%)
Presentation Skill ($M = 1.23$, $SD = .47$), on a 5-point scale

Falls Prevention – Safety Messages ($M = 16.2$) out of a possible 17 (95%)
Presentation Skill ($M = 1.29$, $SD = .50$), on a 5-point scale

Wheeled Sports – Safety Messages ($M = 18.87$) out of a possible 21 (89%)
Presentation Skill ($M = 1.29$, $SD = .54$), on a 5-point scale

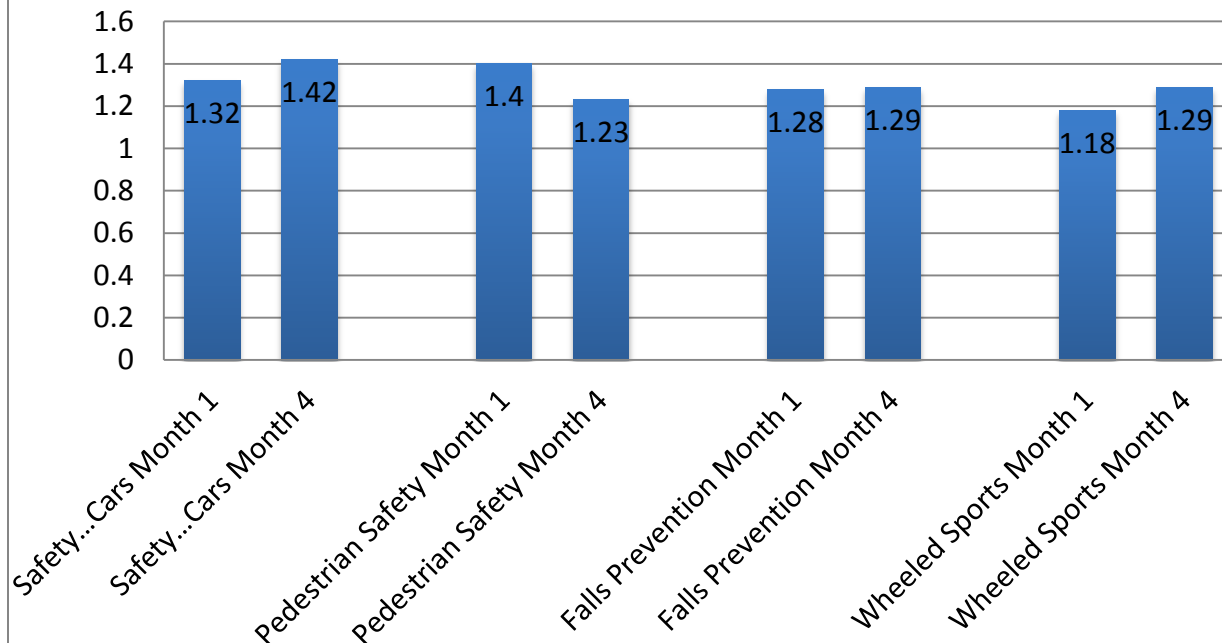
Scores were relatively consistent with the presentation results from the 2012-2013 school year on both first round safety message scores and presentation skills. The 2012-2013 cohort demonstrated an increase in both message (2.8%) and presentation skill (2.2%) between first and last month of presentations based on evaluator feedback. Below are two graphs depicting the 2013-2014 cohort evaluation feedback on safety messages and presentation skills from month 1 to month 4 per topic.

Evaluator Feedback - Messages M1 to M4



Evaluator Feedback - Presentation Skill M1 to M4

(1 = Strongly Agree, 5 = Strongly Disagree)



Assessment of Behavior Specific Responses in Pre and Post Scores for Elementary School Students

Among the questions asked of elementary students on the pre and post safety evaluations, there were four questions regarding safety behavior (*i.e.* “Even when I am busy playing and having fun, I stop to

tie my shoelace when it comes undone”). The behavior questions are of particular importance to this research because the ultimate goal of the Safety Ambassador program is to improve child safety behaviors, thereby reducing the amount of accidents involving children. We ran a paired samples t-test to see what differences were made in overall responses from time 1 and time 2. Again, we saw marked changes between the pre-test and post-test. Below is a review of the averages for each behavior question.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	SlideFirstT1	1.829	1235	.4856	.0138
	SlideFirstT2	1.161	1235	.9691	.0276
Pair 2	HelmetsT1	1.010	1234	.2700	.0077
	HelmetsT2	.617	1234	.5249	.0149
Pair 3	BoosterUseT1	1.169	1224	.4430	.0127
	BoosterUseT2	.684	1224	.6110	.0175
Pair 4	TieShoeT1	1.093	1040	.3537	.0110
	TieShoeT2	.759	1040	.5305	.0165

Based on the output, the Slide First question had the largest response difference between time 1 and time 2, in bold. To further demonstrate the significance in difference from pre-test to post-test the following table is provided:

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	SlideFirstT1 - SlideFirstT2	.6680	1.0482	.0298	.6095	.7265	22.396	1234	.000
Pair 2	HelmetsT1 - HelmetsT2	.3930	.5612	.0160	.3617	.4244	24.600	1233	.000
Pair 3	BoosterUseT1 - BoosterUseT2	.4853	.6825	.0195	.4470	.5236	24.876	1223	.000
Pair 4	TieShoeT1 - TieShoeT2	.3346	.5948	.0184	.2984	.3708	18.143	1039	.000

Based on the Sig. column, in bold, we can see that there is a significant difference in behavior responses between time 1 and time 2 for each set of questions.

To examine improved behavior responses, a t-test was conducted of reported scores from pre-test

to post-test. Results from the t-test found significant differences for all 4 behavior questions from pre-test to post-test where $p < .05$. Individual question comparisons from pre-test to post-test for question 1 found that of the 1177 elementary school students who answered the appropriateness of sliding head first, 91.9% said this was unacceptable behavior at time 1. At time 2, 94% of students said this was unacceptable behavior, demonstrating a positive increase of 3.1%. When asked about wearing a helmet 95.7% believed this was a necessary behavior at time 1. At time 2, 96.7% found this to be a necessary behavior and 3.3% did not, totaling a 1% positive increase. The third question asked about booster seat use behaviors with 79.4% of students saying they use booster seats properly at time 1. At time 2, 87% of students said they incorporated proper booster seat behavior, demonstrating a 7.6% positive increase. Finally, question 4 asked students about stopping to tie their shoe. At time 1, 88.9% of students said they behaved properly in terms of tying their shoe. At time 2, 93.1% of students said they behaved properly in terms of tying their shoe, showing a 4.2% positive increase in safety behavior.

Comparing with last years results, of the first grade classes 873 students completed the pre-test ($M = 85\%$). A total of 239 first grade students completed the post-test, demonstrating an improvement in behavior score ($M = 91\%$). There were 637 second grade students who completed the pre-test ($M = 82\%$). For the 167 second graders who completed the post-test, results were only slightly better than the pre-test scores ($M = 84\%$).

Once again we see some statistical change for both high school and elementary students that suggests the program has some level of positive influence on attitude and behavior. This year we even had a parent report a situation where a child actually applied what they learned from the safety presentations during a moment of duress, potentially saving them from a trip to the ER or even worse, death. The next stage of the study, which will be implemented in the 2014-2015 school year, is to recruit parents from those schools currently participating in the Safety Ambassador Program as well as schools that are not. These parents will be asked to inform researchers on their child's safety behaviors every 6-months over the course of two years. From this data we will be able to identify a) long term safety behavior and b) any differences between those students who received the safety intervention versus those students who did not. We would also like to note that several parents from the 2013-2014 cohort of students from participating schools have agreed to advise us of their child's safety behavior for the next few years. Although we do not have a large enough sample of parents to allow for statistical analyses, we intend to utilize their information in the form of case studies, that we hope will inform our research moving forward.