Protecting You/Protecting Me: Effects of an Alcohol Prevention and Vehicle Safety Program on Elementary Students
Mary Lou Bell, Tara Kelley-Baker, Raamses Rider, Christopher Ringwalt

ABSTRACT: This paper describes an evaluation of Protecting You/Protecting Me (PY/PM), a classroom-based, alcohol-use prevention and vehicle safety program for elementary students in first through fifth grades developed by Mothers Against Drunk Driving. PY/PM lessons and activities focus on teaching children about (1) their brains (why their brain is important, how their brain continues to develop throughout childhood and adolescence, what alcohol does to the developing brain, and why it is important to protect their brain); (2) vehicle safety (what to do to protect themselves should they ever ride with an impaired driver); and (3) life skills (decision making, stress management, and media literacy). Fourth- and fifth-grade students from schools in the fourth year of PY/PM implementation were surveyed. Results indicated that, relative to comparison students from matched schools, PY/PM students increased their knowledge of alcohol’s effect on development; gained decision-making, stress-management, and vehicle safety skills; and demonstrated changes in attitudes toward underage alcohol use and its harms. Further, students retained lessons learned in previous years and their scores improved with increased exposure to PY/PM. In addition, the findings demonstrate that it is possible to design and implement a program that can improve young children’s knowledge regarding alcohol and their developing brains, teach them skills to protect themselves in dangerous situations, increase already high antialcohol attitudes, and change perceptions of alcohol’s harmfulness. (J Sch Health. 2005;75(5):171-177)
Protecting You/Protecting Me (PY/PM), developed by Mothers Against Drunk Driving, is one of the first alcohol prevention and vehicle safety programs to target children in elementary school, beginning in first grade. The goal of the classroom-based program is to prevent the injury and death of children and youth from underage alcohol use and riding in vehicles with impaired drivers. The PY/PM curriculum consists of 40 lessons (1 lesson per week for 8 weeks each in grades 1 through 5) and an equal number of “ownership activities.” Each year’s curriculum reinforces the one taught the previous year. Lessons and activities focus on teaching children about their brains (why their brain is important, how their brain continues to develop throughout childhood and adolescence, what alcohol does to the developing brain, and why it is important to protect their brain); vehicle safety (what to do to protect themselves should they ever ride with an impaired driver); and life skills (decision making, stress management, and media literacy).

PY/PM was named a Model Program both by the National Registry of Effective Programs of the Substance Abuse and Mental Health Services Administration and by the Office of Juvenile Justice and Delinquency Prevention. The program is designed to be led by high school students and by teachers. This study is the first to report results of the latter. Specific research questions included (1) Do students exposed to PY/PM gain knowledge, skills, and attitudes related to underage alcohol use and safety, as compared to students not exposed to the curriculum? (2) What are the cumulative effects of PY/PM exposure on student knowledge, skills, and attitudes related to underage alcohol use and safety? (3) Do students retain the lessons learned in PY/PM from previous years, at the time of a 1-year follow-up?

METHOD

Design and Sample
The study used a quasi-experimental design. The intervention group included all students in first through fifth grades in 4 ethnically and economically diverse schools divided equally between Montana and Texas. Each intervention school was matched with a nearby comparison school on school size, racial/ethnic composition, and percentage of students receiving free or reduced-price school lunch. One comparison school in Montana left the study after the third year and was replaced by another local matched comparison school for year 4. Table 1 displays characteristics of the matched pairs of schools.

In intervention schools, the PY/PM program was implemented annually for 4 consecutive years, beginning in academic year 1999-2000. Prior to teaching the first year, participating first- through fifth-grade teachers (N = 73) attended a 1-day training on the PY/PM curriculum that also included information on childhood and adolescent brain development and alcohol prevention theory. Teachers received booster training sessions before year 4.

These results came from the fourth year of the PY/PM program (academic year 2002-2003), in which all fourth- and fifth-grade students were surveyed. Intervention school teachers administered pretests in November and December 2002, prior to teaching PY/PM; posttests were administered 4 to 6 months after completion. Comparison teachers administered surveys at approximately the same time. In administering the surveys, teachers followed a script and were instructed to read each question aloud twice. There were a total of 1,214 students in fourth and fifth grades in intervention and comparison schools (Table 2). A higher percentage of students completed both pretest and posttest surveys in the Montana schools (matched pairs 3 and 4), which did not require active written parental consent.

Overall, 848 students (70%) completed the pretest. The sample was 49% male, and the ethnic distribution was 56% white, 22% Hispanic, 10% African American, 9% Native American, 1% Asian, and 2% Other (primarily biracial). Analysis of pretest data for intervention and comparison students showed that the groups were comparable by gender and age, but the intervention group included more Hispanics (30% vs 12% in the comparison

Table 1
Characteristics of Matched Pairs of Schools, School Year 1999-2000

<table>
<thead>
<tr>
<th>School Pairs</th>
<th>School Size</th>
<th>% Receiving Free or Reduced-Price Lunch</th>
<th>% White</th>
<th>% African American</th>
<th>% Latino/Hispanic</th>
<th>% Native American</th>
<th>% Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Intervention</td>
<td>567</td>
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<td>45</td>
<td>8</td>
<td>43</td>
<td>0</td>
<td>4</td>
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<tr>
<td>1 Comparison</td>
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<td>36</td>
<td>49</td>
<td>8</td>
<td>38</td>
<td>0</td>
<td>5</td>
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<tr>
<td>2 Intervention</td>
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<td>72</td>
<td>19</td>
<td>45</td>
<td>35</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2 Comparison</td>
<td>365</td>
<td>67</td>
<td>24</td>
<td>45</td>
<td>30</td>
<td>0</td>
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<tr>
<td>3 Intervention*</td>
<td>304</td>
<td>46</td>
<td>63</td>
<td>0</td>
<td>2</td>
<td>34</td>
<td>1</td>
</tr>
<tr>
<td>3 Comparison*</td>
<td>301</td>
<td>52</td>
<td>66</td>
<td>0</td>
<td>2</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>4 Intervention</td>
<td>398</td>
<td>29</td>
<td>90</td>
<td>1</td>
<td>3</td>
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<td>2</td>
</tr>
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<td>4 Comparison*</td>
<td>438</td>
<td>85</td>
<td>94</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

* Includes both elementary (grades K-4) and intermediate (grades 5-6) schools.
group), more African Americans (14% vs 5%), and correspondingly fewer whites (45% vs 69%). Posttest sample demographics revealed a similar pattern, with more Hispanics and African Americans and fewer whites in the intervention group relative to the comparison group.

Most students completed both a pretest and a posttest (722 students). An attrition analysis comparing students who took both surveys with those who took only the pretest showed no differences in racial composition or gender and no significant differences in scores on pretest measures. School records determined how many years students had attended intervention schools and were thus exposed to PY/PM.

**Instruments**

Pretest and posttest surveys included questions assessing student knowledge, attitudes, behavior, and intention regarding underage alcohol use, as well as vehicle safety, media literacy, decision making, stress management, and brain development. All constructs were designed to be measured with multi-item scales. The response format for all items was a 4-point, Likert-type scale. Response anchors for all but 2 scales were YES! (strongly agree), yes (agree), no (disagree), and NO! (strongly disagree). The other 2 scales used frequency response anchors (always, never, etc.). Items were reverse scored where necessary, and all responses were coded from 1 to 4, with 4 indicating the most desirable response.

A 6-item scale assessed the perceived harm of underage alcohol use. Four items were adapted from the Monitoring the Future National Survey on Adolescent Drug Use, and 2 items concerning drinking and driving/riding were added. Students were asked, “How much do you think people less than 21 years of age harm themselves if they: try one or two drinks of beer; try one or two drinks of wine; try one or two drinks of liquor; have one or two drinks of alcohol once a month; ride with someone who has one or two drinks of alcohol; drive after having one or two drinks of alcohol?” Posttest Cronbach alpha revealed an internal consistency of $\alpha = .82$.

A 5-item scale measured future drinking and safety intentions. Students were asked, “In the future, do you think you will: drink beer, wine coolers, liquor; ride in a car with a driver who has had any alcohol; and forget to wear a seat belt when in a car?” Posttest internal consistency was .68.

A 4-item scale, adapted from a scale developed by Hansen and recommended for use in the Center for Substance Abuse Prevention Core Measures Initiative, measured stress-management skills. Items included the following: Do you handle stress well? Do you know what to do to handle a stressful situation? Do you know how to relax when you feel too much stress? Are stressful situations very difficult for you to deal with? The scale’s internal consistency was .71.

To assess decision-making skills, a scale developed by Hansen was adapted and the following items used: (1) attitudes toward underage alcohol use (“Is it okay for teenagers to drink alcohol?” and “Is it okay for teenagers to drink alcohol if they do not drive a car?”); (2) media literacy (“Do commercials on TV tell us what we need to know?” and “Do commercials on TV ever leave out information that could hurt us?”); (3) vehicle safety (“If you ever had to ride in a car with a driver who had been drinking alcohol (beer, wine, or liquor), what would you do: ‘Would you talk to the driver?’ and ‘Would you sit in the front seat to be near the driver in case you needed to help’?”); and (4) development (“Are people grown up when they are 18 years old?” and “Drinking alcohol is more dangerous for people under 21 than for people 21 and older.”).

**Analysis**

Analyses addressed 3 research questions: (1) Do students exposed to PY/PM gain knowledge, skills, and

<table>
<thead>
<tr>
<th>School Pairs</th>
<th>Total N</th>
<th>Pretest (%)</th>
<th>Posttest (%)</th>
<th>Total N</th>
<th>Pretest (%)</th>
<th>Posttest (%)</th>
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</thead>
<tbody>
<tr>
<td>1 Intervention</td>
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<td>47</td>
<td>43</td>
<td>136</td>
<td>64</td>
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<td>84</td>
<td>71</td>
<td>63</td>
<td>81</td>
<td>100</td>
<td>89</td>
</tr>
<tr>
<td>2 Comparison</td>
<td>40</td>
<td>38</td>
<td>35</td>
<td>36</td>
<td>33</td>
<td>31</td>
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<tr>
<td>3 Intervention</td>
<td>55</td>
<td>89</td>
<td>96</td>
<td>45</td>
<td>84</td>
<td>87</td>
</tr>
<tr>
<td>3 Comparison</td>
<td>52</td>
<td>90</td>
<td>90</td>
<td>92</td>
<td>92</td>
<td>91</td>
</tr>
<tr>
<td>4 Intervention</td>
<td>60</td>
<td>78</td>
<td>55</td>
<td>63</td>
<td>87</td>
<td>81</td>
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<td>4 Comparison</td>
<td>92</td>
<td>73</td>
<td>86</td>
<td>75</td>
<td>88</td>
<td>83</td>
</tr>
<tr>
<td>Total</td>
<td>601</td>
<td>63</td>
<td>60</td>
<td>613</td>
<td>77</td>
<td>73</td>
</tr>
</tbody>
</table>
attitudes related to underage alcohol use and safety when compared to students not exposed to the curriculum? (2) What are the cumulative effects of PY/PM (in terms of prior years of curriculum exposure) on student knowledge, skills, and attitudes related to underage alcohol use and safety? (3) Do students retain the lessons learned in PY/PM from previous years at the time of a 1-year follow-up?

For the first 2 research questions, posttest data from fourth- and fifth-grade students collected during year 4 of PY/PM implementation were used. Regression analyses assessed effects of PY/PM intervention status (intervention vs comparison) on responses for the scales in the posttest, adjusting the analyses for the nested nature of the design using the SVYREG procedure in the statistical package STATA. This procedure took into account that individual scores were clustered within classrooms, which were clustered within schools.

To test the second research question, similar adjusted regression analyses assessed the relationship between the number of years students were exposed to the PY/PM curriculum and student scores on posttest measures. Analyses included 219 students with 4 years of exposure, 49 students with 3 years of exposure, 77 students with 2 years of exposure, 88 students with 1 year of exposure, and 362 with no exposure.

For the third research question, pretest data collected from fourth- and fifth-grade students during the fourth year of PY/PM implementation were used. This pretest served as a follow-up measure as it was administered almost a full year after the PY/PM exposure in the preceding year. Analyses included 219 students with 3 years prior exposure to the PY/PM curriculum, 49 students with 2 years of exposure, 77 students with 1 year of exposure, and 450 with no exposure. Analyses were adjusted only for students’ clustering within schools because no theoretical reason suggested that student classroom status in the fourth year would affect their pretest scores that year.

Preliminary chi-square analyses indicated no gender or age differences by intervention status. However, racial composition differed across treatment and comparison groups, so race was included as a dummy-coded covariate in all regression analyses.

### RESULTS

Prior to hypothesis testing, an overall check of the distributions for each item revealed strong skews toward more desirable responses (a ceiling effect). The modal response for all items was a 3 or 4 on a 4-point scale. No differences existed by intervention status at pretest, but the PY/PM group manifested consistently higher means and stronger negative skews at posttest. Hypothesis-testing analyses further explored the differences.

For the first research question, we hypothesized that intervention students, regardless of number of years of exposure to PY/PM, would attain higher posttest scores than comparison students. A significant PY/PM impact occurred in the hypothesized direction for 6 of the 8 outcome measures (Table 3). The drinking and safety intentions scale was unaffected by the PY/PM intervention, and media literacy was only marginally significant. The impact of PY/PM was in the hypothesized direction on every outcome measure.

For the second research question, we hypothesized that PY/PM’s outcomes would be positively associated with students’ number of years of exposure to PY/PM. Significant relationships existed in the desired direction for 6 of the 8 scales tested (Table 4). The remaining two, pertaining to media literacy and drinking and safety intentions, were only marginally significant. All correlations were in the predicted positive direction, suggesting that more exposure to PY/PM was associated with more desirable responses on the dependent measures.

For the third research question, we hypothesized that students’ exposure to PY/PM would be correlated with their follow-up scores as measured in the beginning of their fourth year of PY/PM (the pretest score in that academic year). Significant and positive correlations occurred between the number of years of PY/PM exposure and

### Table 3

Regression of Posttest Outcome Measures on PY/PM Intervention Status

<table>
<thead>
<tr>
<th>Measure</th>
<th>Comparison Mean</th>
<th>PY/PM Mean</th>
<th>Regression Coefficient*</th>
<th>t (6, 38)</th>
<th>p Value†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived harm of alcohol</td>
<td>2.91</td>
<td>3.13</td>
<td>.22</td>
<td>3.81</td>
<td>.00</td>
</tr>
<tr>
<td>Drinking and safety intentions</td>
<td>3.13</td>
<td>3.25</td>
<td>.12</td>
<td>1.41</td>
<td>.16</td>
</tr>
<tr>
<td>Stress-management skills</td>
<td>2.70</td>
<td>2.83</td>
<td>.13</td>
<td>2.07</td>
<td>.04</td>
</tr>
<tr>
<td>Decision-making skills</td>
<td>3.01</td>
<td>3.11</td>
<td>.10</td>
<td>2.15</td>
<td>.04</td>
</tr>
<tr>
<td>Underage drinking attitudes</td>
<td>3.48</td>
<td>3.65</td>
<td>.17</td>
<td>2.40</td>
<td>.02</td>
</tr>
<tr>
<td>Media literacy</td>
<td>3.27</td>
<td>3.38</td>
<td>.12</td>
<td>1.88</td>
<td>.07</td>
</tr>
<tr>
<td>Vehicle safety skills</td>
<td>3.11</td>
<td>3.56</td>
<td>.45</td>
<td>5.62</td>
<td>.00</td>
</tr>
<tr>
<td>Development</td>
<td>3.05</td>
<td>3.50</td>
<td>.45</td>
<td>5.73</td>
<td>.00</td>
</tr>
</tbody>
</table>

* The regression coefficient estimates the mean difference between intervention and comparison groups on a 4-point scale, with a positive number indicating a higher intervention group mean.
† The d.f. are adjusted for the nested design and incorporate race as a dummy-coded covariate. The n sizes differ per scale from 702 to 709, number of teachers = 52, number of schools = 9.
‡ The p value is based on adjusted t tests and rounded to 2 digits.
scores on 5 of 8 outcome measures (Table 5). The decision-
making scale was marginally significant. All correlations
were in the hypothesized positive direction. Thus, more expo-
sure to PY/PM was associated with better overall responses at
follow-up.

DISCUSSION
In this study, students exposed to the PY/PM interven-
tion fared better than students in the comparison group in
most of the domains measured. PY/PM students increased
their knowledge of alcohol’s effect on development and
gained practical skills concerning decision making, stress
management, and vehicle safety. They also demonstrated
changes in attitudes toward underage alcohol use and the
harm it causes. Moreover, PY/PM students retained the
information gained during the previous year’s exposure
and benefited from multiple years of exposure to the
intervention.

Although the procedures employed yielded statistically
significant results and supported the hypotheses, lower-
than-anticipated correlations occurred between PY/PM
exposure and the outcome measures. Low correlations
could have occurred due to the young age of the partici-
pants and the limited variability among their responses.
Also, ceiling effects inherent in the items suppressed vari-
ance in the dependent measures. Young children’s inten-
tions to use alcohol are very low to begin with, and their
negative attitudes toward alcohol are high.

One problem with the design concerned the inability
to track students longitudinally during their 4-year invol-
vement. The original design called for following indi-
vidual students over time by relying on an algorithm
comprising their initials and birth dates, but students had

Table 4
Regression of Posttest Outcome Measures on PY/PM Prior Exposure

<table>
<thead>
<tr>
<th>Measure</th>
<th>Correlation (R)</th>
<th>Regression Coefficient*</th>
<th>t (6, 38)†</th>
<th>p Value‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived harm of alcohol</td>
<td>.18</td>
<td>.06</td>
<td>3.25</td>
<td>.00</td>
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<tr>
<td>Drinking and safety intentions</td>
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<td>.08</td>
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<td>Stress-management skills</td>
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<td>Decision-making skills</td>
<td>.13</td>
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<td>3.35</td>
<td>.00</td>
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<tr>
<td>Underage drinking attitudes</td>
<td>.10</td>
<td>.04</td>
<td>2.26</td>
<td>.03</td>
</tr>
<tr>
<td>Media literacy</td>
<td>.04</td>
<td>.03</td>
<td>1.76</td>
<td>.09</td>
</tr>
<tr>
<td>Vehicle safety skills</td>
<td>.25</td>
<td>.12</td>
<td>6.21</td>
<td>.00</td>
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<tr>
<td>Development</td>
<td>.30</td>
<td>.12</td>
<td>6.07</td>
<td>.00</td>
</tr>
</tbody>
</table>

* The regression coefficient estimates the increase in score (on a 4-point scale) for every additional year of PY/PM exposure.
† The d.f. are adjusted for the nested design and incorporate race as a dummy-coded covariate. The n sizes differ per scale from 672 to 679, number of teachers = 52, number of schools = 9.
‡ The p value is based on adjusted t tests and rounded to 2 digits.

Table 5
Regression of Follow-Up Outcome Measures on PY/PM Prior Exposure

<table>
<thead>
<tr>
<th>Measure</th>
<th>Correlation (R)</th>
<th>Regression Coefficient*</th>
<th>t (6, 727)†</th>
<th>p Value‡</th>
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<tr>
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<td>.17</td>
<td>.08</td>
<td>4.36</td>
<td>.00</td>
</tr>
<tr>
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<td>.01</td>
<td>.48</td>
<td>.63</td>
</tr>
<tr>
<td>Stress-management skills</td>
<td>.09</td>
<td>.04</td>
<td>2.35</td>
<td>.02</td>
</tr>
<tr>
<td>Decision-making skills</td>
<td>.08</td>
<td>.03</td>
<td>1.89</td>
<td>.06</td>
</tr>
<tr>
<td>Underage drinking attitudes</td>
<td>.05</td>
<td>.03</td>
<td>1.51</td>
<td>.13</td>
</tr>
<tr>
<td>Media literacy</td>
<td>.15</td>
<td>.08</td>
<td>4.71</td>
<td>.00</td>
</tr>
<tr>
<td>Vehicle safety skills</td>
<td>.16</td>
<td>.11</td>
<td>4.50</td>
<td>.00</td>
</tr>
<tr>
<td>Development</td>
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<td>.16</td>
<td>7.95</td>
<td>.00</td>
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</tbody>
</table>

* The regression coefficient estimates the increase in score (on a 4-point scale) for every additional year of PY/PM exposure.
† The d.f. are adjusted for the nested design and incorporate race as a dummy-coded covariate. The n sizes differ per scale from 747 to 753, number of schools = 9.
‡ The p value is based on adjusted t tests and rounded to 2 digits.
difficulty remembering their birthdays and were confused by the instructions to use only their initials. Although this procedure was changed in subsequent years, researchers were unable to match later data to earlier data.

Another limitation of the study involved a natural confounding between years of exposure to the curriculum and geographic mobility. Students who relocated often had fewer years of PY/PM exposure, so effects seen for years of exposure could be due, in part, to differences in mobility, which may represent a risk factor for substance use.  

The results showed that increased exposure to PY/PM leads to student gains in several domains. However, the increase in gains across years of exposure was not a steady incline for several scales, perhaps due, in part, to the low number of students exposed to PY/PM 1, 2, and 3 years. Most students were in the comparison group or were exposed to 4 years of the intervention.

Finally, resource limitations precluded collection of systematic data concerning implementation fidelity. Delivery effectiveness could have varied considerably, affected by such characteristics as teacher familiarity with PY/PM and the approach to teaching. A study assessing fidelity to the delivery of PY/PM is currently under way involving videotaping of teachers and analysis of the tapes.

CONCLUSIONS

The study findings are encouraging, although preliminary. Despite challenges presented by gathering data from, and administering information to, a young sample, analyses still detected single-year and cumulative effects for the curriculum. Only recently have school-based, alcohol prevention programs for young children emerged as a potential source of early intervention. This study suggests that it is possible to design and implement a program that can improve young children’s knowledge regarding alcohol and their developing brains, teach them skills to protect themselves in dangerous situations, increase already high antialcohol attitudes, and change perceptions of alcohol’s harmfulness. Most importantly, students exposed to the program retained the information over time, and an association existed between exposure and increased knowledge, skills, and resistance to underage alcohol use. Further research is needed to determine PY/PM’s longitudinal effects with a true randomized control trial in which students are followed over time.

References

27. Bohman T, Barker T, Bell ML, Lewis CM, Holleran L, Pomery E. Early intervention for alcohol use prevention and vehicle safety skills:


