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**RISK AND PROTECTIVE FACTORS ASSOCIATED  
WITH ALCOHOL, TOBACCO, AND OTHER  
DRUG USE AND VIOLENCE**

**Analyses of the 1995 Washington State Survey  
of Adolescent Health Behaviors**

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## Executive Summary

Decades of research have established the association between specific risk factors and protective factors and the likelihood that young people will engage in alcohol, tobacco, and other drug (ATOD) use and violent behavior. Understanding these influences can provide important guidance and direction to prevention and early intervention programs.

The 1995 Washington State Survey of Adolescent Health Behaviors (WSSAHB) included substantial coverage of these factors. In all, 20 risk factors and eight protective factors were assessed using items developed by the University of Washington's Social Development Research Group. They are classified as falling into one of four domains of influence on young people's development: peer-individual, family, school, and community.

This report examines in detail the relationship between risk and protective factors and ATOD use and violence; whether the occurrence of these risk and protective factors varies by a host of background or behavioral characteristics of Washington's students.

Specifically, this report addresses three major questions for Washington state students:

- ◆ Are students of different background characteristics or levels of school involvement any more or less likely to possess these risk or protective factors?
- ◆ Which particular risk or protective factors are most strongly related to ATOD use and violence?
- ◆ Do varying levels and combinations of risk and protection among students make a difference in terms of their ATOD use or violent behavior?

Previous analysis of WSSAHB data confirmed that, as the number of risk factors increases among students, the likelihood of engaging in alcohol or other drug use also increases. Conversely, as the number of protective factors increases, the likelihood of engaging in these behaviors decreases. This

report provides far more detailed information on the nature of these relationships, and explores differences in risk and protection among students with varying characteristics as it attempts to provide even more specific guidance to state and local prevention efforts.

**Question 1: Are students of different backgrounds or levels of school involvement any more or less likely to possess risk or protective factors?**

There were no significant differences between white and nonwhite students, and few gender differences, in the presence of risk and protective factors. Boys are more likely to have favorable attitudes toward engaging in antisocial behavior and believe less strongly in a moral order than girls.

There were no differences among students from rural, urban, and suburban schools; students from large or small schools; or students from schools with high or low minority concentration in the presence of risk and protective factors.

Students at higher grade levels were more likely to be at high risk and have lower protection than younger students. With increasing prevalence of ATOD use as students get older, young people were more likely to associate with peers who engage in these behaviors and less likely to be governed by rules and expectations in the home.

Among many variations in family structure in the home, those students living with both mother and father had fewer risk and more protective factors than students who lived with a single parent, a stepparent or foster parents.

The strongest correlates with risk and protection were students' attendance at school and any history of having dropped out of school. Students' reporting poor attendance were far more likely to possess a variety of risk factors and very few protective factors.

**Question 2: Among all factors studied, which particular risk or protective factors are most strongly related to students' use of alcohol, tobacco, other drugs and violent behavior?**

In general, the risk and protective factors in the peer-individual domain were far more strongly related to the likelihood of ATOD use and violence than were those of the family, school, and community domains.

Risk and protective factors added substantially to the predictability of ATOD use and violence over and above what could be determined from background characteristics of students' grade level, gender, and minority status. For example, in the peer-individual domain, information on students' risk and protective factors added three to six times the predictability of ATOD use and violence to what could be determined from background characteristics alone.

The only significant gender differences across domains were in violent behavior and in smokeless tobacco use. Males were more likely to engage in violent behavior and to use smokeless tobacco than females.

*Peer-Individual Domain*

Students' patterns of antisocial behavior in general, and their attitudes toward illicit drug use in particular, are the strongest predictors of tobacco use, binge drinking, illicit drug use, and violence.

Early initiation of health risk behavior was the strongest correlate with alcohol use in this domain. Students who engaged in any of these undesirable behaviors at an earlier age were more likely to be drinking more frequently as they grew older.

### *Family Domain*

Among family risk and protective factors, a history of engaging in antisocial behavior by other family members (parents or siblings) was the strongest predictor of student alcohol and illicit drug use. Students' perceptions of parents' favorable attitudes toward drug use were the strongest influences on tobacco use, binge drinking, and marijuana use.

### *Community Domain*

Among community risk and protective factors, student perceptions of permissive laws and norms had the strongest association with tobacco use, binge drinking, and marijuana use. Students who felt they were more likely to get caught were less likely to engage in these substance use behaviors.

Perceived availability of drugs and weapons was the most influential predictor of alcohol use, illicit drug use, and violent behavior. Violent behavior was one of the few instances, however, in which the single largest influence among risk and protective factors in this domain was less potent than background factors. Males were far more likely to engage in violent behavior and carry weapons than females, regardless of their profiles of risk and protection.

### *School Domain*

In the school domain, academic failure and low commitment to school were related to all of these health risk behaviors, but these were also less salient than simply knowing what grade level the students were in. As students progress through the educational system, they are more likely to be at higher risk, at lower protection, and engage in ATOD use than they are at earlier grades. Violent behavior was also strongly related to grade level, but it is at its peak among eighth graders and declines steadily through high school.

**Question 3: Is the number of risk and protective factors and their combination associated with the likelihood of students' engaging in ATOD use or violent behaviors?**

In general, the level of risk a student possesses was more strongly associated with his or her engaging in health risk behaviors than was the level of protection present. The level of risk was significantly associated with all general and specific ATOD use and violence behaviors analyzed in this report.

Level of protection was a significant deterrent to the general levels of alcohol and other drug use and both forms of tobacco use. It was not associated with violent behavior or weapon carrying.

However, for specific levels of risk, higher levels of protection were associated with lower frequencies of engaging in health risk behaviors. Among students at highest risk, increasing levels of protection were associated with steadily decreasing frequencies of tobacco use and violence. Again, among students of highest risk, the highest level of protection was associated with significantly lower alcohol and illicit drug use compared to students at lower levels of protection.

Summarily, this report confirms the strong relationship between risk and protective factors and the incidence and prevalence of ATOD use and violence. State and local prevention efforts are well advised to consider these relationships as they attempt to stem the tide of increasing levels of ATOD use among students across the state of Washington.





## Chapter 1: Introduction

The 1995 Washington State Survey of Adolescent Health Behaviors (WSSAHB) included 89 schools and nearly 9,000 students in Grades 6, 8, 10, and 12 across the state. Administered every two years since 1988, the 1995 WSSAHB included attitudes and behaviors in five major adolescent health areas:

Physical Fitness: Nutrition and Exercise

Unintentional Injury: Safe Auto, Motorcycle, and Bicycle Riding

Intentional Injury: Fighting, Weapon Carrying, and Suicide

Alcohol, Tobacco, and Other Drug (ATOD) Use

HIV/AIDS and STD Education

The 1995 survey also included substantial coverage of risk and protective factors associated with these health risk behaviors. Instrumentation developed by the Social Development Research Group (SDRG) at the University of Washington was adapted slightly for use in the statewide survey (Arthur, et al., 1994). The purpose of this report is to present the results of in-depth analyses of these risk and protective factors, particularly as they relate to the backgrounds and demographics of the participating students and the prevalence of selected health risk behaviors included in the survey.

The findings of the 1995 WSSAHB are described in the *Analytic Report* of the survey results (Gabriel, et al., 1995). The technical characteristics of the sample and psychometric properties of the survey instrument and scales are detailed in the *Technical Report* of the survey effort (Deck, et al., 1995). Some of those findings will be reiterated in this report to set the context for the results presented here, but readers who wish further detail on the fundamental findings of the 1995 WSSAHB are referred to those reports.

## Overview of the Risk and Protective Factor Framework

The major findings of the recent WSSAHB have far-reaching implications for prevention and intervention efforts across the state. Decades of prospective and retrospective research have shown that a number of risk factors are associated with increased likelihood of engaging in health risk behaviors such as alcohol, tobacco, and other drug use (Hawkins, Catalano and Miller, 1992) and violent behavior (Bensley and VanEenwyk, 1995; Brewer, Hawkins and Catalano, 1994). Similarly, protective factors may exert a positive influence in the development of young people or buffer against the negative influence of risk. To the extent they are casual influences on health risk behaviors, these risk and protective factors suggest possible approaches to the prevention and amelioration of a number of health problems among adolescents.

In its Social Development Model, the SDRG conceptualize risk and protective factors as occurring in four domains of influence: the individual student and peers, the family, the school, and the community. In all, 20 risk factors and eight protective factors derived from this model were included in this survey. These are listed by domain in Table 1-1, along with the survey forms on which they were included, the number of items used to measure each, and the reliability (coefficient alpha) of each scale used to measure each factor. As evidenced by the excellent reliability of the scales, the instrument had already been extensively field tested and validated by the SDRG staff.

Table 1-1

**Characteristics of Risk and Protective Factor Scales**

<i>Community Factors</i>					
<b>Scale</b>	<b>Name</b>	<b>Type</b>	<b>Forms</b>	<b>No. of Items</b>	<b>Reliability</b>
Low Neighborhood Attachment	Nbhd Att	Risk	B, D	3	0.85
Community Disorganization	Comm Dis	Risk	B, C	5	0.8
Transition and Mobility	Tran Mob	Risk	B, C	4	0.68
Laws and Norms Favorable to Drug Use	Law/Norm	Risk	B, D	6	0.74
Perceived Availability of Alcohol, Tobacco, Drugs, and Firearms	Per Avail	Risk	all	5	0.85
Rewards for Conventional Involvement	Rewards	Protective	B	3	0.92

<i>Family Factors</i>					
<b>Scale</b>	<b>Name</b>	<b>Type</b>	<b>Forms</b>	<b>No. of Items</b>	<b>Reliability</b>
Poor Family Management	Fam Mgt	Risk	B, D	6	0.79
Poor Family Discipline	Fam Dis	Risk	B, D	3	0.76
History of Antisocial Behavior	Antsoc B	Risk	B, D	10	0.82
Parental Attitudes Favorable Toward Antisocial Behavior	Par Att	Risk	B, D	6	0.86
Low Family Attachment	Fam Att	Risk	B, D	4	0.75
Opportunities for Positive Involvement	Opport	Protective	B	3	0.79
Rewards for Conventional Involvement	Rewards	Protective	B	4	0.78

Table 1-1, cont.

<i>School Factors</i>					
Scale	Name	Type	Forms	No. of Items	Reliability
Academic Failure	Ac Fail	Risk	all	2	0.76
Little Commitment to School	Low Comm	Risk	all	4	0.75
Opportunities for Positive Involvement	Opport	Protective	B, C	2	0.62
Rewards for Conventional Involvement	Rewards	Protective	B	2	0.67

<i>Peer-Individual Factors</i>					
Scale	Name	Type	Forms	No. of Items	Reliability
Rebelliousness	Rebell	Risk	B, C	3	0.83
Early Initiation of Problem Behavior	Early Init	Risk	B, D	8	0.82
Antisocial Behavior	Antsoc B	Risk	all	8	0.87
Attitudes Favorable Toward Antisocial Behavior	Att Ant B	Risk	B, D	4	0.84
Attitudes Favorable Toward Drug Use	Att Drug	Risk	all	4	0.87
Interaction With Antisocial Peers	Antsoc Pr	Risk	B, D	6	0.76
Friends' Use of Drugs	Fr Use Dr	Risk	B, D	4	0.86
Sensation Seeking	Sens Seek	Risk	B	3	0.74
Peer Rewards for Conventional Involvement	Rewards	Protective	B	4	0.87
Belief in the Moral Order	Mor Ord	Protective	B, D	4	0.69
Social Skills	Soc Skil	Protective	all	4	0.58

Note: Forms A and B were shortened forms used at Grade 6; Forms C and D were used at Grades 8, 10, and 12.

## Summary of Prior Findings on Risk and Protective Factors

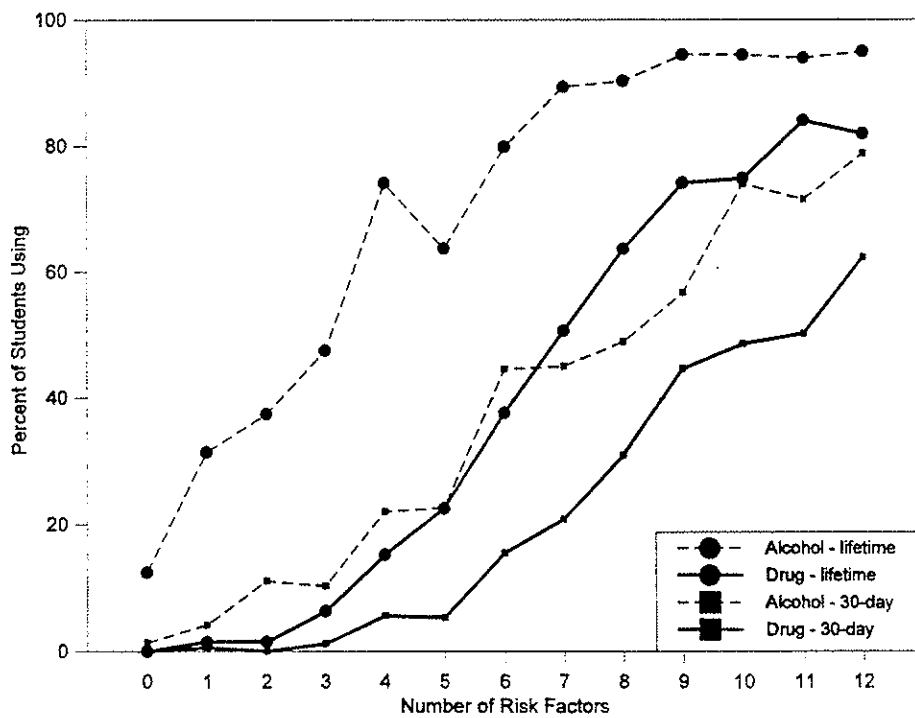
Specific findings pertaining to grade level differences in the prevalence of risk and protective factors and simple bivariate correlations between these factors and the health risk behaviors under study were presented in the *Analytic Report* of survey results (Gabriel, et al., 1995). A brief summary of these results, analyzed by domain and grade level, follows:

- ◆ Sixth graders reported the lowest risk and highest levels of protection in family and peer-individual domains. The pattern across grades was less uniform in the school and community domains.
- ◆ Of all risk and protective factors, those in the peer-individual domain evidenced the strongest relationships with health risk behaviors. Risk and protective factors in the family domain had the next strongest correlation with health risk behaviors.
- ◆ In general, school and community risk and protective factors had weak relationships with health risk behaviors, although a few of these factors were moderately correlated with the health risk behaviors.
- ◆ The relationships between risk and protective factors and health risk behaviors were fairly consistent, with alcohol use typically the most strongly associated and violent behavior the least strongly associated with these factors.
- ◆ The cumulative effect of risk and protection on alcohol and other drug use was very evident among Washington students. Students at high risk on a larger number of risk factors were increasingly more likely to use alcohol and other drugs while students possessing a larger number of protective factors were increasingly less likely to use alcohol and other drugs.

The final point in the summary above merits further discussion here for at least two reasons. First, because it represents strong validation of the risk and protective factor frameworks and evidences the cumulative effects of risk and protection on the health risk behaviors of interest. Secondly, because it spawned much of the interest in the analysis conducted for this report.

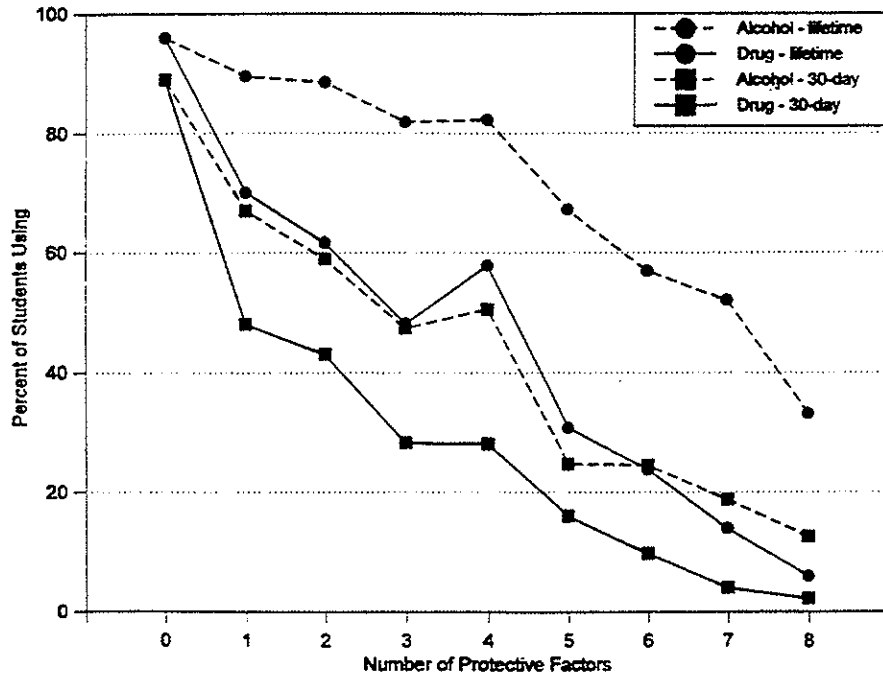
In Figure 1-1 and 1-2, the relationships between the number of risk factors (Figure 1-1) and protective factors (Figure 1-2) with selected indicators of alcohol use and other drug use are displayed. There is clear indication that as the number of risk factors increases in students, the prevalence of alcohol and other drug use also increases. Conversely, as the number of protective factors increases in students, the prevalence of these behaviors decreases. While these relationships are not perfectly linear, e.g., there are “plateaus” in which the prevalence of alcohol or other drug use does not increase within a given range of increased risk or decreased protection, they are generally monotonic through the range of numbers of risk or protective factors in evidence.

**Figure 1-1 The Relationship Between Alcohol and Other Drug Use With the Number of Risk Factors Reported by Washington Students**



Source: 1995 WSSAHB

**Figure 1-2 The Relationship Between Alcohol and Other Drug Use With the Number of Protective Factors Reported by Washington Students**



Source: 1995 WSSAHB

## Contents of This Report

This report extends the analysis already conducted on risk and protective factors in three directions, corresponding to the remaining three chapters.

In Chapter 2, the relationship of background/demographic characteristics and participation at school with the risk and protective factors is presented. These analyses provide answers to the question of whether the prevalence of risk or protection is related to demographic factors, family structure, and other measures such as participation in extracurricular activities at school.

In Chapter 3, the relationship of the full array of risk and protective factors with selected health risk behaviors is presented both within and across domains (peer-individual, family, school, and community). These analyses supplement the simple bivariate correlations presented in the *Analytic Report* and identify the most powerful predictors of these behaviors in the context of the full complement of risk and protective factors.

In Chapter 4, the interrelationships of risk and protective factors are examined as they affect the health risk behaviors under study. It is commonly believed that the prevalence of risk and protective factors has an inverse relationship, i.e., that a student who is at high risk on a large number of risk factors is necessarily at low protection on the array of protective factors. There is little empirical evidence on this point or on the way in which varying combinations of risk and protection influence health risk behaviors. This interplay of risk and protective factors is the focus of the final chapter of this report.

### **Interpretation Guidelines**

This report consists mainly of correlational analyses among demographic characteristics of students, their risk and protective factors, and the extent to which they engage in a number of health risk behaviors assessed in the Washington State Survey of Adolescent Health Behaviors. These correlations appear in many forms: *simple correlations* between two variables, *partial correlations* between two variables removing the influence of several other variables, and *multiple correlations* relating a set of predictor variables to a single criterion or outcome variable.



A few characteristics of correlations to keep in mind in reading this report:

Correlation coefficients range from zero to one. A zero (.00) correlation indicates no relationship between the variables. Knowing the value or score of one variable tells you nothing about what the value or score of the other might be. A correlation of one (1.00) indicates a perfect relationship. Knowing the value of one tells you exactly what the value of the other is. Typically, of course, correlations fall somewhere between these extremes.

Simple and partial correlation coefficients can be positive or negative (e.g., .35 or -.35). Positive correlations indicate that high values on one variable are associated with high values on the other (and low with low). For example, people's height and weight are positively correlated. In general, taller people weigh more than shorter people. Negative correlations indicate that high values on one variable are associated with low values on the other. An example of this might be people's age and the number of hours of sleep they get per night. In general, older people need and get less sleep than do younger people.

Multiple correlations are always positive. Among the full set of predictor variables there may be both positive and negative relationships with the criterion variable, but the multiple correlation coefficient is always positive, indicating the magnitude of the overall relationship between the set of predictors and the criterion on a scale from zero to one. The direction of the relationships between individual predictor variables and the criterion is expressed in the weights assigned to each variable in the prediction equation.

Squaring the value of the correlation indicates the proportion of variance in common between the variables being correlated. For example, a simple correlation of .50 indicates that 25 percent of the variance in one variable is shared by or is predictable from the other. The proportion of common variance can range between 0 percent (a correlation of .00) and 100 percent (a correlation of 1.00 or -1.00).

In reporting and interpreting the literally hundreds of correlations in this report, the authors will not use the conventional method of discussing only those relationships that are statistically

significant. Because of the large number of students who participated in the WSSAHB, even very small correlations—indicative of non-zero but very weak relationships—would be interpreted using conventional levels of statistical significance (i.e.,  $p < .05$  or  $p < .01$ ). Instead, standards suggested by Cohen (1988) will be used as an initial guideline. He classifies correlations as falling in three categories. *Small* correlations are those exceeding .10, indicating 1 percent of the variance in common between the variables. *Moderate* correlations are those exceeding .30, indicating 9 percent of the variance in common. *High* correlations are those exceeding .50, indicating 25 percent of the variance in common. Throughout this report, the authors will adhere to this terminology of small, moderate, and large in interpreting statistically significant correlations.

## Chapter 2: Interrelationships of Risk and Protective Factors With Demographic and School Participation Characteristics of Students

Little was said in the *Analytic Report* of survey findings about the distribution of levels of risk and protective factors in subpopulations of adolescents. The prevalence rates of some risk and protective factors were found to differ by grade level. Others were shown to be consistent across grades. No attempt was made to see if differences were present between racial groups or if the differences between grades could be explained by some other characteristic that changes with age.

This chapter will examine the relationships between the risk and protective factors and a variety of background and demographic characteristics. These analyses will attempt to explain whether the prevalence of risk or protection is consistently greater for certain demographic groups, family structure, participation in extracurricular activities or other behavioral groups.

Analyses will first examine the direct relationship of each background/demographic characteristic measured in the WSSAHB to each risk and protective factor. Then the context of the full set of demographic and background variables will be determined through multiple linear regression (MLR) analysis. This analysis will afford an interpretation not available from the simple correlations in that it will estimate the *unique contribution* of each background variable in the prediction of risk and protective factors. That is, the MLR will partial out the common influence of all other background variables and provide an estimate of the influence of each of these factors over and above the influence of the others in predicting risk.

## Measurement of Student Background Characteristics

Eighteen items in the WSSAHB contained demographic and family- or school-related background information. Because of the large number of questions on the overall survey, two forms were used at each grade and only half of the students responded to some of the questions. Eleven questions were asked of all students: age, grade, gender, zip code, the number of adults in the family, the number of siblings, the race/ethnicity of the student, their parents' educational attainment, which relatives live in the home with the student, the number of nonschool activities participated in, and the number of days in the previous month that the student skipped class or was absent.

Three questions were asked of older students (Grades 8, 10, and 12), but not asked on the sixth grade survey. The older students were asked how many hours per week they worked in a part-time job, how many school sports teams they participated on in the previous two years, and if they had ever dropped out of school for more than 30 days.

Two background questions were asked of half of the students at all grade levels. These students were asked how many hours of sleep they typically got on a school night and if they had ever gone to bed hungry in the previous month due to lack of money for food. This question was suggested as an indicator of extreme poverty.

The final background question was on the number of extracurricular school activities in which the student participated. Half of the older students (Grades 8 through 12) were asked this question. These were the same secondary students that were asked about hours of sleep.

The entire set of risk and protective factor questions was asked of only half of the students surveyed. This half was the half **not** asked about extracurricular activities, amount of sleep, and whether they had gone to bed hungry. These three questions were thus of little use in examining the characteristics of students at risk, except for a small number of questions about risk and protective factors which were asked of all students. Other background questions omitted from this analysis were those asking students about their parents' educational attainment (highest degree earned). Even among older students, these reports were so low that it was clear the majority of students were not providing valid information in this potentially important indicator (Gabriel, et al., 1995).

### *Family*

Several of the family background questions were recoded to form new variables based on combinations of response options. Question 9 on all forms of the survey asked the student to check all family members living with them. If either a foster mother or foster father was checked, the student was identified as being in a **foster family**. Likewise, a **blended** family was indicated by the presence of a stepmother or stepfather. When a mother or stepmother and a father or stepfather was identified, the student was categorized as being in a **two-parent family**. Whenever grandparents, aunts, or uncles were marked, the student's family was identified as being an **extended** family. Lastly, those students who marked both "mother" and "father," were identified as living with their parents. Approximately six out of ten students participating in the WSSAHB reported living with their parents. Among all of these recoded variables, students could be identified as living in more than one type of family (e.g., parents and extended).

### *Race/Ethnicity*

Race was another question providing multiple points of comparison. Due to the low prevalence of minority populations in Washington, conducting separate analyses for each racial group could

not have been done with statistical precision. Instead, students' race/ethnicity was recoded to indicate either white or nonwhite. Anyone who marked one of the five nonwhite options to the eighth question on all forms or who indicated a Hispanic background in the following question were counted as minorities. Coded this way, approximately one-fourth of the students were classified as a **minority**.

It is important to emphasize here that all subsequent analyses in this report that include the effects of race/ethnicity are differentiating only between white and nonwhite students. Again, African Americans, Hispanics, Asians, and American Indians were not analyzed separately due to their small and potentially nonrepresentative samples in the survey.

### **Simple Correlational Analyses**

Each of the background variables was correlated with the scores on the risk and protective factors. Table 2-1 shows where simple relationships were found between background variables and the measures of the risk and protective factors. Only correlations with an absolute value of .15 or larger are printed. A period (".") is printed where a coefficient could not be computed due to both sets of questions not being asked to the same students. The protective factors were scored such that a high score indicated greater protection. The direction of correlations with protective factors was typically opposite those of risk factors. Increasing grade level is often related to increasing risk. Consequently grade level is positively correlated with risk factors and negatively correlated with protective factors.

Three variables stand out as consistently relating to factors of risk. "Dropout," the question of whether a student had ever dropped out of school for at least 30 days, had small correlations of .15 or greater with 13 of the risk and protective factors; and moderate correlations of .30 or higher with four. A related variable, "absent"—the number of times a student was absent in the

previous month—had small correlations with 18 of the risk and protective factors; moderate correlations with five. Both of these variables showed consistent relationships in each of the four domains. Grade was the third variable showing a consistent relationship to risk and protective factors. This result is not surprising and was shown repeatedly in the *Analytic Report of WSSAHB* (Gabriel, et al., 1995). Many of the risk factors require time to develop. Sixth graders are typically not involved in drug use, so any sixth grader is much less likely to have friends who are users (Fr Use Dr). Other factors, such as norms favorable to use (Law/Norm) or poor family discipline (Fam Dis), show, by their relationship to grade level, that adults treat teenagers more like adults and hold greater control over younger children.

Gender evidenced small correlations with six factors, all in the peer-individual domain. The highest correlation was with the factors of attitudes favorable toward antisocial behavior (Att Ant B) and belief in a moral order (Mor Ord). Girls indicated stronger adherence to a conventional moral order and attitudes less favorable to antisocial behavior than boys. Many believe that girls tend to act out internally, while boys act out more outwardly, and this manifests itself in apparently greater compliance among girls and rebelliousness among boys. This difference in response to stressors should also show up in the pattern of responses to the questions measuring peer and individual risk factors.

Table 2-1 contains 17 different variables based on the item pertaining to family composition. Each of the 12 relatives listed in the item is represented as a dichotomous variable (presence or absence of that family member in the home) in the table. Additionally, as discussed earlier, variables were constructed to reflect being in a two-parent family (Family); being in a family with a stepparent (Blended); having a foster parent (Foster); living in a family with aunts, uncles, or grandparents (Extend Fam); and living with their mother and father (Parents). Each of these types of families could be associated with greater or less protection from developing unhealthy or antisocial behaviors and each for differing reasons.

Four of the 17 family variables showed a tendency to relate to risk: father, no adult, family, and parents. Parents, the variable indicating that the child lived with his/her mother and father and no foster or stepparent, correlated with more risk or protective factors than the other three variables.

One other pattern of correlations in Table 2-1 is worthy of note. In the school domain, the amount of sleep reported and the extent of involvement in activities outside of class both correlated negatively with two risk factors: academic failure and low commitment to school. A negative correlation indicates that students who sleep less or are less involved in outside activities are at a higher level of risk. Having dropped out and often being absent are also related to higher risk. The fact that these background variables are related to these risk factors is not surprising. Dropping out and skipping class show a low commitment to school. Children who do not like school will not usually become involved in extracurricular activities.

Of these school relationships, perhaps the most interesting correlation is the one between the amount of sleep and a low commitment to school (Low Comm). There is probably not a direct relationship here, but one that involves several other associated and intervening factors. If students are not sleeping, are not committed to school or doing well there, and are not involved in other school or community activities, then they must be doing something else. Hours of sleep is also related to community disorganization, perceived availability of drugs, rebelliousness, attitudes favorable toward use, and social skills. (Questions on family risk factors were not asked along with the question on sleep.) The students who do not sleep as much appear to live in disorganized communities where they believe illicit substances are readily available. These students also have more positive attitudes toward use, are more rebellious, and have poorer social skills. It is likely that these characteristics lead to their lower commitment to school and their lower achievement.

Four characteristics of the schools were also included in these analyses. The size and rural/urban nature of the community, the size of the school, and the concentration of minorities in the school were relatively unrelated to the students' scores on these risk and protective factors. Even



though these indices were used as sampling strata in the selection of schools for the survey sample, (Deck et al., 1995), there is little evidence that they correlate with the presence of risk and protective factors at the individual student level. The prevalence of risk and protection appear to be distributed across all kinds of schools all over the state.

Several variables were chosen for closer examination by multiple correlation analysis. These variables were chosen either because they had consistently high correlations with risk and protective factors or because they represented characteristics of importance in the research literature and/or to policymakers in Washington. The selected variables were separated into two sets. Five purely demographic measures comprised the first set of variables. The second set contained four questions concerning behavior.

The demographic variables chosen for further analysis were gender, grade, living with both mother and father (abbreviated in the table as Parents), minority status (Minority), and having gone to bed hungry (Hungry). Unfortunately, as noted earlier, the question on hunger (proposed as an indicator of extreme poverty) was asked only with seven risk factors and one protective factor.

The student behavior set included involvement in extracurricular activities (Extra Act), number of absences (Absent), having previously dropped out of school (Dropout), and hours worked at a job (Hrs Work). The extracurricular question was asked only with four risk factors and one protective factor.

Analyses of individual risk and protective factors included all nine available background and student behavior variables. Analyses of students' total level of risk did not include the items on hunger or extracurricular activities because of their low co-occurrence with risk and protective factors on survey forms. Sixth graders, who were not asked all risk questions, were not included in analyses of total risk or any risk factor for which they were asked an insufficient number of questions.

Table 2-1  
**Simple Correlations Between Risk Factors and Background Variables**

	Community Domain					Family Domain							
	Nbhd Att	Comm Dis	Tran Mob	Law/Norm	Per Avail	Rewards*	Fam Mgt	Fam Dis	Antsoc B	Par Att	Fam Att	Opport*	Rewards*
Grade				.37	.25		.25	.41	.28	.16			
Gender													
Mother			-.25				-.15		-.18				
Father			-.27				-.17		-.21				.16
Stepmom													
Stepdad													
Grandmom													
Granddad													
Aunt													
Uncle													
Foster Mom													
Foster Dad													
Other Adult									.15				
No Adult							.17		.17				
Foster													
Blended			.16										
Extend Fam													
Family			-.24				-.19		-.19				-.16
Parents			-.31				-.18		-.22				-.18
Num Adult													
Siblings													
Minority			.15										
Hungry													
Extra Act													
Schl Spnt													
Other Act			-.15										
Absent		.17		.26			.23	.25	.34	.24			
Dropout		.24		.20	.16		.22		.31	.28			
Hrs Work				.16	.22								
Hrs Sleep		-.23			-.17								
Min Con													
Enroll													
Urban													
Size													

\* Protective Factors.

• Correlation not computed because two variables didn't appear on same survey form.

**School Domain**

	<u>Ac Fail</u>	<u>Low Comm</u>	<u>Opport*</u>	<u>Rewards*</u>
Grade		.20		
Gender				
Mother				
Father	-.15			
Stepmom				
Stepdad				
Grandmom				
Granddad				
Aunt				
Uncle				
Foster Mom				
Foster Dad				
Other Adult				
No Adult				
Foster				
Blended				
Extend Fam				
Family				
Parents	-.19			
Num Adult				
Siblings				
Minority				
Hungry	-.36			
Extra Act	-.22	-.23		
Schl Sprt	-.24	-.16		
Other Act	.28	.26		
Absent	.22	.22		
Dropout				
Hrs Work				
Hrs Sleep	-.15	-.25		
Min Con				
Enroll				
Urban				
Size				

\* Protective Factors.

**Peer-Individual Domain**

	<u>Rebell</u>	<u>Early Init</u>	<u>Antsoc B</u>	<u>Att Ant B</u>	<u>Att Drug</u>	<u>Antsoc Pr</u>	<u>Er Use Dr</u>	<u>Sens Seek</u>	<u>Rewards*</u>	<u>Mor Ord*</u>	<u>Soc Skil*</u>
Grade	.16	.25			.37		.35			-.22	-.16
Gender		.17	.15	.21				.19		-.21	-.17
Mother		-.19									
Father		-.18									
Stepmom											
Stepdad											
Grandmom											
Granddad											
Aunt											
Uncle											
Foster Mom			.17								
Foster Dad											
Other Adult											
No Adult		.17	.20			.18					
Foster			.18								
Blended											
Extend Fam											
Family		-.17									
Parents		-.23					-.15				
Num Adult	-.16										
Siblings											
Minority											
Hungry			.22								
Extra Act											
Schl Sprt											
Other Act							-.15				
Absent	.29	.37	.27	.24	.32	.32	.35	.25	-.16	-.25	-.27
Dropout	.19	.36	.39	.20	.22	.30	.25	.16		-.15	-.21
Hrs Work					.17						
Hrs Sleep	-.30		-.19		-.28						.24
Min Con											
Enroll											
Urban											
Size											

\* Protective Factors.

Table 2-2

### Frequencies of Selected Background Variables by Grade

Gender (Boys)		Parents		Hungry		Minority		Extra Act (No Activities)		
Grade	Percent	N	Percent	N	Percent	N	Percent	N	Percent	N
6	50.4%	2,711	63.2%	2,857	4.3%	1,366	27.2%	2,665	NA	NA
8	49.6	2,447	60.9	2,510	4.9	1,195	22.0	2,401	26.0%	1,203
10	48.4	1,923	59.9	2,106	4.8	1,056	24.4	2,009	29.1	1,062
12	50.2	1,292	58.2	1,307	3.1	631	20.8	1,230	29.0	635
All Grades	49.7%	8,373	61.0%	8,780	4.4%	4,248	24.1%	8,305	27.8%	2,900

Grade	Absent (3 or More Days)		Dropout (Yes)		Hrs Work (Do Not Work)	
	Percent	N	Percent	N	Percent	N
6	16.8%	2,816	NA	NA	NA	NA
8	24.2	2,484	4.4%	2,495	75.4%	2,334
10	30.0	2,099	6.2	2,104	67.2	1,666
12	38.3	1,303	5.8	1,305	37.5	574
All Grades	25.4%	8,702	5.4%	5,904	64.1%	4,574

Notes: "N" is the number of students answering the question.  
 "NA" entered where question not asked of that grade level.

Table 2-2 shows what the sample of students was like in the areas measured by these demographic variables. Approximately half of the students surveyed were male, and almost two-thirds of the students live with their mother and father, although this proportion decreases for older children. Only about 4 percent reported going to bed hungry due to lack of money for food. About one-fourth were members of a minority group. Interestingly, that percentage decreases at the higher grades.

perhaps reflecting the higher dropout rate among minorities. Over two-thirds of the students reported taking part in extracurricular activities including sports, while about a quarter were absent at least three days in the previous month. Few students, about one in 20, reported having previously dropped out of school. This “dropout” ratio stayed rather steady across the three grades where this question was asked. Only about one in four eighth graders worked at a part-time job, but these rates increase dramatically with grade level. Among high school seniors, nearly two-thirds have some kind of part-time job during the school year.

### **Multiple Correlational Analyses**

From the simple correlations presented in Table 2-1 it can be seen that some background variables tend to be related more to risk and protective factors in one domain and have less of a relationship to the factors in other domains. Since the factors in a given domain share a conceptual framework, it was decided to examine each domain separately. Are there background characteristics that relate primarily to one domain but not others? Why does a given background characteristic show up with one risk factor, but not another? This approach allows us to address several questions. Are some correlations between background characteristics and risk factors due to a direct relationship or because of commonalities within the demographic variables?

For example, are past dropouts still at risk, or do they only appear at risk because they may tend to be older boys? Does the protection afforded to children living with both original parents continue even when the impact of other characteristics is considered?

The rest of this chapter will examine each risk and protective factor, grouped by domain, to see which background variables have the most direct relationship to levels of risk or protection. Table 2-3 contains the multiple correlations between each risk factor with, first, the set of demographic variables alone and, second, that set plus the set of school-related behavior

variables. For the multiple correlations the risk scores were recalculated to form dichotomous scores indicating “at risk” or “not at risk.” The regression analyses thus indicate not just a relationship between background variables and degree of risk, but begin to allow a description of the characteristics of students at risk.

Table 2-3

**Multiple Correlations of Demographic and School-Related Behavior Variables on Risk and Protective Factors by Domain\***

Community Domain		
	Demographic Variables Only	Demographic Plus School Behavior Variables
Nbhd Att	.16	.18
Comm Dis	.14	.22
Tran Mob	.26	.34
Law/Norm	.29	.35
Per Avail	.25	.31
Rewards**	.12	.20
Family Domain		
	Demographic Variables Only	Demographic Plus School Behavior Variables
Fam Mgt	.18	.29
Fam Dis	.41	.44
Antsoc B	.31	.37
Par Att	.11	.25
Fam Att	.13	.16
Opport**	.10	.18
Rewards**	.18	.23

\*\* Protective factors

School Domain		
	Demographic Variables Only	Demographic Plus School Behavior Variables
Ac Fail	.16	.33
Low Comm	.13	.24
Opport**	.05	.10
Rewards**	.10	.15
Peer-Individual Domain		
	Demographic Variables	Demographic Plus School Behavior Variables
Rebell	.17	.27
Early Init	.35	.44
Antsoc B	.24	.41
AttAnt B	.20	.32
Att Drug	.29	.40
Antsoc Pr	.23	.38
Fr Use Dr	.36	.41
Sens Seek	.16	.25
Rewards**	.09	.23
Mor Ord**	.24	.31
Soc Skil**	.27	.35

The partial correlations between the two sets of predictor variables and each risk and protective factor are in Table 2-4. Each partial correlation coefficient is the partial correlation between that variable and the dichotomized risk score after adjusting for all other background variables in the two sets. Each partial correlation thus shows the unique relationship between the background variable and the risk factor. For instance, there is a -.10 partial correlation between low neighborhood attachment and parents even after adjusting for the influence of grade, gender, minority, absent, dropout, and hours worked. In other words, there is a small but significant negative relationship between living with your mother and father and low neighborhood attachment—students who live with their mother and father are less likely to report low neighborhood attachment. All significant partial correlations are shown. “NA” is printed when the relationship could not be tested due to no student being asked both sets of questions.



Table 2-4

**Partial Correlations Between Risk and Protective Factors  
With Background Variables**

Community Domain						
	<u>Nbhd Att</u>	<u>Comm Dis</u>	<u>Tran Mob</u>	<u>Law/Norm</u>	<u>Per Avail</u>	<u>Rewards*</u>
Grade				.23	.15	
Gender				.08	.08	
Parents	-.10	-.07	-.20	-.05	-.07	.08
Minority		.08	.07			
Hungry	NA	-.04	-.07	NA		NA
Extra Act	NA	NA	NA	NA		NA
Absent		.09	.06	.14	.14	-.16
Dropout		.13	.22	.12	.06	
Hrs Work					.08	

Family Domain							
	<u>Fam Mgt</u>	<u>Fam Dis</u>	<u>Antsoc B</u>	<u>Par Att</u>	<u>Fam Att</u>	<u>Opport*</u>	<u>Rewards*</u>
Grade	.08	.35	.22			.05	
Gender		.14		.09			
Parents	-.10	-.09	-.13		-.10	.05	.11
Minority			.04		.06	-.05	-.11
Absent	.10	.14	.15	.11	.08	-.13	-.15
Dropout	.20		.09	.19		-.04	
Hrs Work						-.04	

Table 2-4 cont.

School Domain				
	<u>Ac Fail</u>	<u>Low Comm</u>	<u>Opport*</u>	<u>Rewards*</u>
Grade			.07	
Gender	.06	.06		
Parents	-.07			
Minority				.06
Hungry		.06	NA	NA
Extra Act	-.16	-.06	NA	NA
Absent	.15	.09	-.06	-.09
Dropout	.15	.15		
Hrs Work	-.04		-.06	-.07

Peer-Individual Domain											
	<u>Rebell</u>	<u>Early Init</u>	<u>Antsoc B</u>	<u>Att Ant B</u>	<u>Att Drug</u>	<u>Antsoc Pr</u>	<u>Fr Use Dr</u>	<u>Sens Seek</u>	<u>Rewards</u>	<u>Mor Ord</u>	<u>Soc Sk</u>
Grade		.20			.19	.09	.31		.09	-.16	-.15
Gender	.09	.14	.15	.15	.09	.10		.15	-.05	-.16	-.15
Parents	-.08	-.16	.04	-.06	-.05	-.07	-.09			.05	.06
Minority				.04		.07		-.05	-.05		
Hungry		NA	.04	NA	.05	NA	NA	NA	NA	NA	-.05
Extra Act	NA	NA	-.04	NA	-.11	NA	NA	NA	NA	NA	-.05
Absent	.18	.22	.20	.17	.18	.24	.19	.18	-.11	-.18	-.18
Dropout	.10	.11	.23	.16	.13	.16	.06		-.15	-.05	-.08
Hrs Work			.06						-.06	.06	

## Conversion of Factor Scores to Identification of Risk/Protection

In the primary analysis of the WSSAHB presented in the *Analytic Report*, a scale score was calculated for each of the risk and protective factors by averaging the responses to all survey questions pertaining to that factor. In some cases, the responses were recoded to allow all items in the scale to be on the same metric. Constructing a scale score for each risk or protective factor was useful for statewide analyses, but it is also useful to identify a student as simply "at risk" or not. In order to identify which students were at risk on each factor, the scale scores were split at a selected point. Any score above that point was deemed at risk, any score below was not.

For most scales, the cutting point was the mid-point of the scale. If a scale had a potential range of scores from zero to three, the cut-off was set at 1.5. Any score above 1.5 was identified as at risk. Many factors were composed primarily of questions with responses of the type "NO!", "no," "yes," "YES!" When these options were coded 0, 1, 2, and 3, a score above 1.5 represented agreement with most of the questions. All scales involving degrees of agreement like this were split at the mid-range.

One other type of response scale was used for risk and protective factors assessment. For instance, the scale concerning antisocial behavior in the peer-individual domain could have a top score of seven. Each question in this scale concerns how often the student had behaved in any of eight antisocial manners in the previous year. The point identifying risk was set at 0.5. Thus any student who typically engaged in these behaviors or engaged in one or more frequently would be categorized as at risk in the area of antisocial behavior. Even with this lower setting, only 11 percent of students were in the "at risk" category of this risk factor. The average scale score was .75. All risk and protective scales involving questions of ever doing a behavior were dichotomized in this manner.

In the remainder of this chapter, the multiple and partial correlation results will be presented for each risk and protective factor in each domain.

## **Community Domain**

**Neighborhood Attachment.** This multiple correlation coefficient was .18, nearly the lowest of all risk and protective factors. Only parents, minority, and absent were statistically significant predictors. There is a slight tendency toward higher risk of detachment from one's neighborhood for children who do not live with both mother and father, are nonwhite, or miss school often.

**Community Disorganization.** A disorganized community was characterized by students perceiving crime or drug selling, many fights, lots of empty buildings, lots of graffiti, and/or a place they did not feel safe. When all eight selected background variables were included in the multiple correlation, those at risk due to community disorganization were primarily students who had dropped out of school. Lesser yet statistically significant predictors included being from a minority group, not living with both parents, and going to bed hungry.

**Transition and Mobility.** The most mobile students were much less likely to live in a family with both their mother and father and much more likely to have dropped out of school. Perhaps their incident(s) of dropping out occurred during a move. It is also possible that their mobility is due to divorce or other family disruption. These students also tended to be from minority groups.

**Laws and Norms Favorable to Drug Use.** Questions on this scale asked about neighborhood adults' and police attitudes toward use of marijuana, alcohol, cigarettes, and carrying handguns. The selected background variables had the highest predictive influence on this factor of all

factors in the community domain with a multiple correlation of .35. Students at higher risk tended to be older, to have dropped out of school before, and to miss school more.

Grade level was the strongest predictor of risk due to a perception of norms favorable to drug use. This could very likely be due to adults being more accepting of drinking or smoking among high school students than they are of those same activities with sixth or eighth graders.

While school attendance evidenced a high partial correlation on this factor, its relationship may be more a function of engaging in the health risk behaviors themselves. The simple correlations between this factor and both the alcohol and drug use scales were .42. It is possible that many of the students at risk are already using alcohol and other drugs. These students would be the ones likely to have dropped out of school or be losing attachment to school as reflected in lower attendance.

**Perceived Availability of Alcohol, Tobacco, Drugs, and Firearms.** The overall multiple correlation and the pattern of partial correlations between specific background variables and this risk factor is similar to that reported for laws and norms favorable to drug use. Students at high risk tend to be older and absent more. Small, but statistically significant, correlations were also seen with gender, hours of work, living with both parents, and history of dropping out of school. Going to bed hungry and number of extracurricular activities were asked with this factor. Interestingly, neither contributed a significant amount to the correlation with risk. This is one risk factor that appears to be unrelated to a student's income level or participation in activities.

**Rewards for Conventional Involvement (Protective Factor).** "Neighbors who care" is the emphasis of this protective factor. The multiple correlation was among the lowest in this domain. The highest partial correlation occurs with being absent from school. Those students who are absent more are also those feeling less rewarded and valued in their communities. This

factor also seems to have little relationship to ATOD use, correlating at about .20 with the alcohol and drug use scales.

## **Summary**

Students who reported poor attendance or who had dropped out of school one or more times were the group most likely to be at risk in the community domain. The strongest relationships were with laws and norms favorable to drug use and transitions and mobility. When these risks were high, more students were from families in which one original parent was no longer present. Grade level was also a significant predictor of laws and norms and perceived availability of alcohol, tobacco, drugs and firearms. As students get older, they find these substances and weapons easier to get and perceive a more permissive attitude toward their use from the community. Importantly, this is true regardless of minority status or family structure. Students who were not living with both their mother and father, however, were at higher risk due to transitions and mobility and low neighborhood attachment.

## **Family Domain**

**Poor Family Management.** Most of the questions used in this survey to measure this factor involved parents' attention to their children's behavior in the areas of homework and curfew. Three of the six questions had to do with being home on time and knowing where the child was. This factor was related to school attendance, previously dropping out, and not living with both mother and father.

In families that fail to provide clear rules and monitor their children's behavior it would make sense that children would be more greatly influenced by peers. Many of these children could

develop a low attachment to school. If they skip class, their parents may not know or care. Such a scenario would explain the relatively strong relationship between risk and the two background variables of school absence and having dropped out.

When all selected background variables were regressed on the dichotomous measure of this risk factor, each variable that had significant simple correlations continued to have significant partial correlations. However, the pattern of those correlations changed. For example, grade level remained a significant predictor of risk due to poor family management, but having dropped out was the most important. Even after accounting for a history of dropping out, recent school attendance remained significant at a reduced level. Living with both mother and father was associated with lower risk, even for older students and those who miss school more.

**Poor Family Discipline.** Three questions were used to measure this risk factor. Each one asked if the students believed they would be caught by their parents if they drank, skipped school, or carried a gun. Nothing was asked of the consistency or severity of parents' discipline. Conceptually, these questions are similar to the questions on the family management risk factor having to do with parental supervision. Attentive parents would catch misbehaving children. Inattentive parents would not, whether or not they approved of the behavior. The family discipline scale has a correlation of .58 with the family management scale.

Grade level is the strongest predictor of family discipline. In fact, family discipline is the risk factor to which grade level is most strongly related. School absence and gender also have small but significant correlations with this factor. Unlike the scale on family management, family structure and a history of dropping out of school are not strongly related to this risk factor.

Gender increased its predictive influence after accounting for the interrelationships of the other variables. Boys are much more prone to reporting that they would not get caught by their

parents, even after adjusting for their grade level, family structure, attendance, and hours of work. These questions may be measuring male bravado in addition to parent discipline.

**History of Antisocial Behavior.** This scale was composed of four items on adult behavior with illicit substances, five items about siblings, and one question as to whether any one in the family had a severe substance abuse problem. This was one of the scales that included different response options across its items. The last six questions required merely a “yes” or “no” answer. These were coded 0 for “no” and 5 for “yes.” For the other questions, a 0 meant no adult the students knew had engaged in that behavior. A 1 or higher number meant one or more adults had. An average score greater than .5 was identified as at risk. In retrospect, this may have been a bit low. All a student would need to be in the “at risk” category is one sibling who had ever drunk and one who had ever smoked. Nearly two-thirds of students were consequently identified as at risk on this factor.

This family risk factor evidenced a significant partial correlation with student attendance, grade level, and living with both mother and father. Students at higher grade levels who are evidencing greater absenteeism from school and who do not live with both their mother and father are more likely to come from families with a history of antisocial behavior and be at risk on this factor.

**Parental Attitudes Favorable Toward Antisocial Behavior.** Six questions were asked of the students about how they thought their parents felt about substance use, stealing, drawing graffiti, and fighting. Importantly, this scale does not measure parents’ actual attitudes, but, rather, their child’s perception of those attitudes. Still, these perceptions are very important. If children think their parents disapprove, they are usually less likely to engage in that behavior. If they do not know whether their parents would approve or not, they assume that their parents feel the same way they do. In either case, whether they know their parents’ attitude or assume it, they will behave based on what they think they know.



The two predictor variables of primary importance are dropout and school absence. Past dropouts and those students who show up less often for class tend to have parents who are more (or who students think are more) approving of antisocial behavior. When these two characteristics are taken into consideration, grade level makes no difference, but boys are slightly more likely to perceive their parents' approval than are girls.

**Low Family Attachment.** The last three risk and protective factor scales in the family domain have to do with family involvement. All three have questions which ask about feeling close to one's parents, sharing thoughts with them, enjoying the time they spend together, and going to them with problems. The three scales have high internal consistency and are highly intercorrelated with each other (Deck et al., 1995). As noted in the previous chapter, these are highly reliable measures, but they may be reliably measuring the same construct.

Four items comprised the family attachment scale. These asked about feeling close to the child's mother, sharing thoughts with their mother, spending time with their father, and sharing thoughts with their father. This scale had the lowest multiple correlation ( $R=.16$ ) of any of the family domain risk and protective factors. Students who did not live with both their mother and father were at highest risk due to low family attachment.

**Opportunities for Positive Involvement (Protective Factor).** Three questions composed this scale. Each asked about opportunities to do fun things, be involved in family decisions, and willingness to take problems to parents.

Although six of the seven background variables had statistically significant partial correlations, from a practical significance perspective, none was very large. The highest predictive influence was with student attendance. Children absent more often report somewhat fewer opportunities for positive family involvement. Other groups with significantly higher levels of protection,

though these were small differences, include older students, children living with both mother and father, whites, those who work fewer hours, and those who have stayed in school.

**Rewards for Conventional Involvement (Protective Factor).** The last protective factor in the family domain was composed of four items on spending time with one's mother, feeling close to one's father, parents noticing a good job, and parents who say they are proud of the child.

Again, partial correlations with all background variables were low. Higher school attendance and living with both mother and father were associated with higher protection. Children from minority families were a little less likely to be protected, even if they lived with both parents and attended school regularly.

## Summary

Reduced school attendance typifies the prediction of risk in the family domain. Partial correlations between the measure of recent absenteeism (Absent) and each risk and protective factor ranged from .08 to .15. Other variables had higher partial correlations on some factors, but no other variable was significantly correlated to as many risk and protective factors. Living with both mother and father came close, having small but significant partial correlations on four of the seven family risk and protective factors. These students were substantially at less risk of having a family with a history of antisocial behavior, having low family attachment, and coming from families with poor management. They were more likely to experience rewards for involvement with the family.

## School Domain

**Academic Failure.** Two closely related questions formed this scale. One asked for and estimated a student's grade point average. The other asked how the student's grades compared to his/her classmates. The number of extracurricular activities was the best single predictor of this risk factor. As with so many other factors, students who missed lots of school or who had dropped out in the past showed a higher level of academic failure.

There is a logical relationship between academic failure and the background variables of involvement in other activities, missing class, and dropping out. All three background variables are conceptually related to commitment to school, the next risk factor. The measure of school commitment, discussed below, correlated very highly ( $r=.51$ ) with the scale of academic failure.

**Little Commitment to School.** Many of the same variables related to academic failure were found to be related to commitment to school, although this risk factor was less predictable ( $R=.24$ ) than was academic failure ( $R=.33$ ).

When the interrelationships among the demographic variables were statistically removed, only students who had dropped out before showed substantially less commitment to school. Several other groups had small, statistically significant differences. Those who had been absent or went to bed hungry were slightly less committed to school. Girls and anyone involved in extracurricular activities were slightly more committed.

With the relatively large simple correlations and the logical link between academic failure, attendance, and commitment to school, it is hard to explain the low partial correlations. A closer examination of the individual items yields a possible explanation. Almost every student surveyed expressed an extreme agreement to the school commitment items. In the case of these questions, the common response was "YES!" The definition of "at risk" used for this factor was

similar to that of other factors, an averaged score equal to the middle of the choices given. Thus if anyone's average response was on the "no" side, they were deemed at risk. Unfortunately, only about 5 percent of the sample marked their answers that low. It appears that few students were willing to admit to anything less than total commitment to school.

### **Opportunities for Positive Involvement and Rewards for Conventional Involvement**

**(Protective Factors).** The two protective factors in the school domain were each composed of two questions. Nothing correlated with either scale to a high enough degree to discuss. The multiple and partial correlations were the lowest of all risk and protective factors in all domains.

### **Summary**

In general, the prediction of risk and protective factors in the school domain was the lowest of all domains. Students who had dropped out of school one or more times were at highest risk in this domain. That relationship should be expected. Those students with little commitment to school or who are struggling in school are often the ones who miss class the most. Students experiencing academic failure (risk 31) and low commitment to school (risk 32) were also over-represented by students who did not participate in extracurricular activities—all characteristics of students who would rather be doing things other than going to class or associating with teachers.

### **Peer-Individual Domain**

**Rebelliousness.** Three questions formed this scale. Each asked for agreement with a belligerent behavior such as doing "the opposite of what people tell me, just to get them mad."

When the seven selected background variables were entered into a multiple regression equation, school attendance and a history of dropping out of school remained the primary correlate of risk due to rebelliousness. Gender, and family structure were also significant, but very small.

To better display the relationship between rebelliousness and attendance, we examined the increased risk for increasing levels of absenteeism. First, only 11 percent of students reporting no absences in the previous 30 days were deemed at risk on this factor. The percentage grew as the number of days absent increased. Of those reporting one or two days absent, 18 percent were at risk. Of those gone three to five days, 26 percent were at risk. Finally, those who said they had missed more than five days had 40 percent at risk.

**Early Initiation of Problem Behavior.** Eight items formed this scale. Each asked at what age the students had first tried each of four substances, got suspended from school, were arrested, carried a gun, or attacked someone. To identify risk, a student had to have first participated in one of the behaviors at age 10 or younger and have done one of the other seven at some time. Alternatively, a student who had done three of these things would also have been considered at risk.

This risk factor is one of the two most well-predicted from a combination of the selected background variables. The multiple correlation was .44. Five of the seven background variables included contributed significantly to the correlation.

Absence from school and previously dropping out tended to describe students at risk on all of the factors in the peer-individual domain. This was most true of this risk factor. About half of all students surveyed were at risk due to early initiation of problem behavior. However, 77 percent of those absent more than five days were at risk and 91 percent of those who had ever dropped out were at risk. The relationship was also strong for grade level and family structure. Only 25 percent of sixth graders were at risk, while 60 percent of seniors had done enough of the listed behaviors to be at risk. Children in families with both their mother and father were more than a

third less likely to be at risk on this factor (38 percent to 59 percent). Gender showed a similar difference with just over half of the boys at risk (52 percent), but only two-fifths of the girls (39 percent).

Once the attendance pattern of former dropouts was related to early initiation, the actual experience of having dropped out was of less importance. It appears that not only do children who are likely to drop out stop attending school, those who have dropped out and return continue to attend sporadically.

**Antisocial Behavior.** Eight questions asked how many times the students had ever done things such as being suspended, getting arrested, fighting, carrying guns, stealing, or being drunk. If they had done half of the actions listed or had done any often, they were deemed at risk. This risk factor comes very close to eclipsing the line between risk factor and actual health risk behavior. Someone who has been drunk at school 20 times and suspended three times would fall into the “at risk” group. One could say that, for alcohol use, they had gone past risk to abuse. Their abuse of alcohol could leave them at risk of other unhealthy behaviors.

Three predictors showed fairly large association with this risk factor: dropout, low attendance, and gender. For former dropouts, antisocial behavior most clearly differentiated them from their peers who had never left school. Though only 13 percent of the eighth through twelfth graders were deemed at risk due to antisocial behavior, 55 percent of those who had dropped out were at risk. In other words, students who had dropped out of school for a time were more than four times as likely to engage in antisocial behavior.

Attendance made the biggest difference for those who missed more than five days; 36 percent were reported as having engaged in substantial antisocial behavior. Seventeen percent of those missing three to five days were at risk. The majority of students, those missing no more than two days in the previous month, had only about 6 percent at risk on this factor.

Boys were slightly more at risk than girls on this factor. Fifteen percent scored high enough to be at risk, while only 6 percent of the girls were at risk.

**Attitudes Favorable Toward Antisocial Behavior.** The measure included four questions on how wrong students felt it was to fight, steal, or carry a gun. Where risk 43 asked about actual behaviors, this scale asked about the students' attitudes toward some of those same behaviors. Many of the same background variables correlated with this scale.

As with nearly all the factors in this domain, dropout and absent had the highest correlation with favorable attitudes toward antisocial behavior. Gender turned out to have a relatively high relationship to this factor. Of the boys, 14 percent were at risk, but only 5 percent of the girls were at risk. All three of these background variables maintained a small but significant relationship with this risk scale in the partial correlation. It seems that the people who have positive attitudes towards antisocial behaviors are similar to the ones who are committing antisocial behaviors.

**Attitudes Favorable Toward Drug Use.** The four questions in this scale were similar to the questions in risk 44, but they specifically asked about substance use including alcohol, cigarettes, marijuana, and other illegal drugs. The characteristics of the students scoring highly on this factor are a little different from the characteristics of those who feel positively toward antisocial behavior or actually engage in antisocial behaviors.

Grade level made the biggest difference between those most in favor of drug use and those least in favor. Only 4 percent of sixth graders were at risk due to a positive attitude about substance use. Over 30 percent of the seniors, however, were favorable enough toward drug use to be at risk—a sevenfold increase across these grades.

Frequent absence, having dropped out, and nonparticipation in extracurricular activities also described those students with positive attitudes toward drug use. Clearly, whatever leads students to skip class and be less involved in school activities increases as they get older and increases their risk of developing unhealthy behaviors.

**Interaction With Antisocial Peers.** Of the six questions in this scale, five asked of the students' friends the same questions that were asked of each student in risk 43, the measure of antisocial behavior. One question in this scale also asked if any friends had dropped out of school.

Only three variables had meaningful partial correlations with this factor: dropout, absenteeism and gender. Being absent remained strongly related to interaction with antisocial peers. Much of the risk seen among former dropouts appears to be due to their continued poor school attendance. Boys also were more likely to be at risk on this factor.

**Friends' Use of Drugs.** Four questions asked what substances students' friends used and how many friends used them. To be considered at risk a student had to report at least one friend using three different substances, or three friends using the same substance. The pattern of correlations was almost identical to the scale of attitudes favorable to drug use. Since these two risk scales have a correlation of .69, it may be that students acquire their positive attitudes from friends who use or they select friends who have attitudes similar to their own.

Overall, about half of the students surveyed were considered at risk due to friends' use. This ranged from 27 percent of sixth graders to 72 percent of seniors—evidencing the significant relationship of this risk factor with grade level. Similarly, only 37 percent of those not missing any school were at risk, but 79 percent of those missing five or more days were.

**Sensation Seeking (Risk Factor).** Young people who seek out dangerous situations or dangerous behaviors are more likely to participate in health risk behaviors. Little distinguishes



those high in sensation seeking from those not as high. School attendance and gender are the only variables showing a great difference in this risk factor. A little over half of the students were identified as being at risk on this factor. To be at risk a student had to report doing all three behaviors in their lifetime, two of the three behaviors in the last year, or one behavior weekly.

Students who missed more than five days were about 50 percent more likely to be at risk on this factor than students missing no school. Forty-seven percent of the students who missed no school were at risk compared to almost 75 percent of those most frequently absent. Boys also scored a little higher on this scale, indicating they were about 10 percent more at risk than the state average.

**Peer Rewards for Conventional Involvement (Protective Factor).** This scale was composed of four items, each phrased as: "What are the chances that you will be seen as cool if you ..." smoke cigarettes, drink alcohol, smoke marijuana, or carry a handgun. Worded this way, the questions appear to address students' perceptions of their peers' attitudes toward use. This scale has lower correlations with the other factors in this domain, indicating that it may be measuring a unique aspect of peer-individual risk or protective factors. Only school attendance and a history of dropping out of school had small but significant partial correlations with this protective factor.

Closer examination of the scale showed that most students said that there was little chance that others would see them as cool for any of the behaviors. With very little difference between individual scores on this factor, it is unlikely that differences between groups could be found. It is interesting that so many students thought these behaviors were acceptable or know others that do these, but they do not think they would "look cool."

**Belief in the Moral Order (Protective Factor).** Students were asked four questions about moral and immoral behavior. The questions were on stealing, cheating, fighting, and honesty. Young people who agree with society's moral code have reduced risk of participating in harmful

behaviors. Lower scores on this protective factor were seen for boys, older students, and those who miss school often.

Over 85 percent of the sixth graders agreed enough with these questions to be considered protected. There was little difference among the other grades, with their average being about 65 percent. Sixty-five percent of boys but nearly 80 percent of the girls were protected. Likewise, just over 80 percent of the students who missed no classes were protected; only half of the students who missed five or more days were protected.

**Social Skills (Protective Factor).** Four questions posing situations involving moral and interpersonal predicaments were asked. Each question had two right answers and two wrong answers. Those who gave the desirable answers on three questions were considered protected.

The biggest difference was again between those who attend school regularly and those who skip class often. Nearly four out of five students who missed no school were deemed protected on this factor. However, only two in five of those missing school the most were protected. Gender and grade level were also significant predictors. Boys and older students were less protected in terms of these social skills.

## Summary

For the peer-individual domain the nine selected demographic and behavior variables had the greatest predictive capability. Multiple correlations ranged from .25 to .44. Again, school attendance (Absent) correlated with every risk and protective factor, always the highest or second highest partial correlation among the background variables. Students at risk due to personal behaviors or attitudes or at risk due to their friends' attitudes and behaviors are much more likely to miss school. Former dropouts were also at higher risk, even after accounting for poor

attendance, on seven of the 11 risk and protective factors. Gender differences also appeared for seven of the risk and protective factors. Working at a part-time job or being a member of a racial minority had little relationship to the peer-individual domain.

## Conclusions

Often in social research, apparently strong simple correlations are due to the common influence of third factor. For example, one could detect a strong positive correlation between ice cream sales and soda pop sales and conclude that if you want to sell more pop you should also sell ice cream. In fact, the relationship may be due to people buying more of each as the days get hotter. Thus it is important to examine simple correlations more closely by computing partial correlations with all important predictor variables. In this chapter we looked at both the simple correlations of risk factors with background variables and then examined the unique relationships between those background variables and the risk measures after accounting for the simultaneous influence of other background variables.

Generally, the simple correlations held up after the more careful scrutiny of the partial correlation statistics in the multiple correlation analysis. The selected background variables tended to be important in explaining at least some of the difference between students at risk and those not at risk. Those differences were not usually further explained by other background variables. This is most likely because the selected background variables were almost entirely unrelated to each other and therefore contributed unique influence in the prediction of risk and protective factors. Table 2-5 lists the intercorrelations among the selected background variables. Those correlations statistically significant at the level of .01 are identified, although only about half of these reach Cohen's (1988) standard for a "small" correlation ( $r > .10$ ). For "hungry" the correlations are based on about 4,300 surveys. "Extra act" is based on 2,900 surveys. Almost 6,000 students were asked the questions "dropout" and "hrs wrk," while over 8,000 answered the other

questions. Since fewer students were asked “extra Act,” “hungry,” “drop out,” and “hrs wrk,” a higher correlation is needed with these four variables in order to reach the same level of statistical significance.

**Table 2-5**  
**Correlations Among Background Variables**

	Grade	Gender	Parents	Minority	Hungry	Extra Act	Absent	Dropout
Gender	-.01							
Parents	-.04**	.02						
Minority	-.04**	.02	-.08**					
Hungry	-.01	-.01	-.08**	.06				
Extra Act	.00	-.05	.11**	-.06**	-.06**			
Absent	.21**	-.05**	-.12**	.04**	.10**	-.11**		
Dropout	.03	.01	-.14**	.11**	.14**	-.09**	.21**	
Hrs Work	.39**	.06**	.01	-.03	.03	-.03	.14**	.04

\*\* p < .01

The largest simple correlation is between grade and number of hours worked ( $r=.39$ ). Older students work more hours. Since, by law, children under age 16 can work very few hours, this is the pattern we would expect. The number of hours that students worked was rarely related to their likelihood of being at risk. In the cases where it was, grade level explained the difference sufficiently.

The only other correlations between background variables that are high enough to make a difference involve the number of days students were absent. Older students report missing class more than younger students. Students who are absent more are also more likely to report having dropped out of school for a while. Attendance was related to most of the risk and protective factors. This relationship remained strong even after accounting for grade level and history of

dropping out. For many factors that one indicator, school absence, had the highest unique contribution of all background factors in predicting risk.

Several variables are remarkable for the absence of important correlations with risk factors. Correlations between the number of adults or the number of siblings in the family and any risk factor were all less than .12. The variable created to identify single-parent families did have several large correlations. It may be that the relationship between the number of adults in a family and any risk factor is curvilinear. Children in families of fewer than two or more than three adults may be at greater risk than children in families with two or three adults. Alternatively, the number of adults may not matter as much as who they are. Having two parents may be more important than living with one parent and a relative or unrelated adult.

No question on the survey directly measured family income, but one question asked if the student had gone to bed hungry due to lack of money to buy food any time in the previous month. Very few respondents (4 percent) indicated that this had happened to them. This question was only asked on one form of the test at each grade level and was asked in combination with only nine risk factors on the same form. This admittedly weak measure of poverty was significantly correlated with only one of these nine risk factors: antisocial behavior.

Minority status was another variable that showed little relationship to the risk and protective factors. When the two questions on race were recoded to identify whites and nonwhites, only very small differences appeared between the groups. The popular stereotype is that minorities are more likely to be users and are more likely to be living in situations or behaving in ways that puts them at noticeably greater risk. The evidence from this survey does not support that stereotype; although, as noted throughout, the minority status variable did not differentiate among racial/ethnic minorities. So, the analyses presented here cannot be viewed as a thorough assessment of racial/ethnic differences in risk and protective factors.

Grade level consistently correlated with many risk factors, as would be expected. The longer children live, the more likely they will experience the things in life that increase their risk of developing harmful behaviors. For example, even if a family has not moved by the time a child is 12, the family could still move in the next five years. One-fifth of American households move each year. Over time, a child's chance of moving away from friends and relatives increases. Such a move could increase that child's exposure to risky influences or remove protective ways of coping. Certainly older children are more aware of their world and the actual availability of various substances. Eighth graders and high school students are more concerned about their peers than are sixth graders. National surveys of ATOD use also tell us that, with each grade, more of a child's peers experiment with alcohol or other drugs and more have begun to abuse those substances. As more of their peers use, each individual student becomes more at risk.

Family structure was one demographic variable expected to identify children at risk. The impact of divorce on children has been widely studied and publicized in recent years. Single parenthood and blended families carry special burdens and added stress into children's lives. The variable created to identify children in blended families (one stepparent) was rarely related to risk and, in those cases, the correlation was fairly low. Another variable, labeled "family," was created to identify two-parent families versus one-parent families. This indicator did relate to several risk and protective factors in the family domain. A final family structure variable was created which, in some ways, combined the concept of the first two family variables. This one, labeled "parent," identified whether or not a child lived with both his/her mother and father, stepparents and foster parents excluded. This variable correlated with the same risk factors as family, but more strongly.

It appears that living with both parents is associated with added protection. It is not clear if living in a single-parent or stepparent family increases risk. There may be something found more often in the environment of a stepfamily or single-parent home or in the environment of the child's home before it became a single-parent or stepparent home that adds to a child's risk of developing unhealthy behaviors. This characteristic of the home may not be directly related to the marital status of the parent(s). For instance, one question on the survey asked if the student

had ever been abused or mistreated by an adult. Twenty-two percent of the students surveyed indicated they had been abused or mistreated, being much the same in each of the three grades where this question was asked. This single yes/no question correlated fairly highly with the family and parents variables. Only 13 percent of children living with both parents reported abuse, while over a third (34 percent) of those in one-parent or blended families said they had been abused or mistreated. For several of the risk factors the simple correlation with abuse was greater than any other background variable discussed in this chapter.

Low family attachment, as measured in the family domain of risk factors, was especially predicted by knowing if the child has been abused. After calculating the multiple correlations discussed in the body of this chapter, abuse and three additional variables were added to the equations. A regression equation including these four variables increased the multiple correlations with the low family attachment risk factor from .16 to .26. The highest partial correlation was with abuse, .20.

The other three added variables were named "gang," "binge," and "tobac." The gang question read, "Are you the member of a gang ... or other group which uses violence or threats of violence for protection or to gain respect?" "Binge" was a measure of how many times in the previous two weeks the student had consumed five or more drinks in a row. Lastly, "tobac" was a recalculation of the items concerning tobacco use to indicate if a student had ever used tobacco.

Abuse may be the key variable in explaining why some families exhibit less risk and why children who have lower attachment to home are at greater risk of participating in unhealthy behaviors.

All four additional variables were strongly related to most of the health and safety behaviors of this survey as well. They also consistently correlated highly with most of the risk factors. Of all the variables examined in this chapter, only one risk factor (transition and mobility) correlated

more highly with parents than did abuse. When these four additional variables were added to the calculations, the difference in risk between students living with their mother and father and those living in other family configurations was reduced. Thus, the particular structure of the family may be less fundamentally related to risk and protection than the behaviors elicited in the home.

Further examination of this survey's data or further research would be needed to better explain the relationships and to describe the key characteristics relating family structure, abuse, risk factors, and health risk behaviors.

Gender differences were also apparent with many of the risk factors. When taking all other background variables into account, the risk factors showing the greatest gender differences were in the peer-individual and family domains. No substantial differences between the genders appeared in the school or community domains. Some of the difference between boys and girls may be explained by their differing ways of handling stress. Many feel that girls tend to internalize their problems and withdraw, while boys are more likely to act out in rebellious and antisocial ways. Most of the peer-individual risk factors involve rebelliousness and antisocial behavior. Consequently, boys' ways of responding to disagreeable or stressful situations are the same behaviors that put them at risk of engaging in unhealthy activities.

Two background variables stood out as consistently having strong relationships with the risk factor scales. One variable identified students who have left school for at least 30 days, but have returned. About 5 percent of WSSAHB respondents had dropped out and returned. The second variable measured a student's attendance during the 30 days prior to the survey. These are naturally related variables. Most students who drop out do so gradually. They quit going to class or even skip going to school at all some days. Over time their attachment to school weakens and they finally quit. Based on the correlation between these variables, it looks like some students who leave for a while, but come back, continue to have low attachment to school and tend to miss class often.



Out of all the background variables examined, attendance exhibited the highest correlations with alcohol and other drug use and the highest correlation with the measures of violence. It appears that attachment to school as measured by attendance is more an indicator of substance use than it is of risk. Its correlations with risk factors are likely not evidence of the potential for substance abuse, but reflecting the fact that many students who are at risk are already using.

One last background variable was of interest. One form of the survey asked questions on nine risk factors and on the number of hours that students slept on week nights. For nearly every one of those nine factors, amount of sleep was negatively related to risk. Older students get less sleep, but so do students who are absent more. Those who are involved in sports actually get more sleep. Participation in other extracurricular activities is not related to amount of sleep. Substance use is. It seems that students who do not sleep as much are not studying, as there is a strong negative relationship between commitment to school and hours of sleep. These students are not at play practice or playing on the school basketball team. The correlations suggest that students who are getting less sleep, especially less than five hours a night, are more likely to be using alcohol or other drugs or involved in behaviors that put them at risk. Whether they are using by themselves or with friends is not clear. There was no measure of attachment to peers in the survey, and the risk scales pertaining to peer use and attitude were not asked of the same students as the question on sleep.

Summarily, we began this analysis with the question of what groups in the population are more at risk of participating in unhealthy behaviors. Two final conclusions may be possible. Those who miss school a lot may be most at risk, but may also be already using illicit substances or participating in risky behavior. Older students (high school) are at greater risk, especially when one examines peer influence. Boys and children in one-parent or blended families have a slightly greater risk on some factors. Otherwise, based on a thorough consideration of background variables, no group is clearly at greater risk than others. Being at risk depends upon each individual, their experiences, and how they handle them.



## Chapter 3: The Relationships of Risk and Protective Factors to Alcohol, Tobacco, and Other Drug Use and Violence

In the *Analytic Report* of survey findings, simple bivariate correlations between each risk and protective factor and many of the health risk behaviors were presented. These results clearly identified the magnitudes of the relationships between each of these factors in isolation and the health risk behaviors under study.

In this chapter, the relationship of each risk and protective factor, in the context of the full array of risk and protective factors, is examined through multiple linear regression (MLR) analysis. This analysis will afford at least two interpretations not available from the simple correlations. First, it will provide an estimate of the predictive influence of the full set of risk and protective factors on the ATOD use and violence-related behaviors under study. Second, it will identify the *unique contribution* of each risk and protective factor in predicting the health risk behavior. That is, the MLR will partial out the common influence of all other risk and protective factors and yield an estimate of the influence of each of these factors over and above the influence of the others in predicting ATOD use and violence.

### Analysis Method: Predictors and Criteria

The MLR analyses presented in this chapter were conducted in a preset, systematic manner. There are eight criterion variables (two indicators within each of the substance use and violence areas) used in all of the analyses—these are the health risk behaviors that are predicted by the risk and protective factors included in the survey:

Alcohol Use:	Alcohol Use Composite Scale Binge Drinking in the Last Two Weeks
Tobacco Use:	Use of Cigarettes in the Last 30 Days Use of Smokeless Tobacco in the Last 30 Days
Drug Use:	The Drug Use Composite Scale Use of Marijuana in the Last 30 Days
Violence:	The Violent Behavior Composite Scale Weapon Carrying in the Last 30 Days

Composite scales were chosen whenever possible because of their superior content coverage and reliability to individual items. The content and reliability of these scales are detailed in the *Technical Report* of the survey effort (Deck, et al., 1995).

The multiple linear regression analysis for each of these criterion variables were conducted first **within** each risk and protective factor domain, i.e., separately for peer-individual factors, family factors, etc. Following these analyses, a second set of MLRs were conducted across all domains to determine if additional predictability was attained by adding the risk and protective influences from all rather than a single domain.

The MLR analyses were all conducted in stepwise fashion, in which the risk or protective factor evidencing the strongest relationship with the criterion entered the prediction equation first, followed by the risk or protective factor that added the most to the prediction over and above the first factor, etc., until there was no statistically significant predictability added by any of the remaining risk and protective factors.

Prior to the consideration of risk and protective factors, however, all MLRs first included three background characteristics in the prediction equation: gender, race/ethnicity, and grade level. This has the effect of removing any predictability due to these fundamental influences before considering the influence of risk and protection. That is, any differences between males and females, white and nonwhite students<sup>1</sup>, and students at different grade levels on the health risk behaviors being predicted will be taken into account before the risk and protective factors are examined. This has the interpretive effect of “levelling the playing field” based on these characteristics and prefaces the discussion of the influence of risk and protective factors with a phrase such as “for students of the same race/ethnicity, grade level and gender” the significant risk and protective influences on this criterion variable are ...”

The remainder of this chapter will discuss the MLR results by risk and protective domain, presenting the findings for the prediction of each of the eight selected health risk behaviors. The peer-individual domain will be discussed first, followed by the family, the community, and the school.

### **Peer-Individual Risk and Protective Factors**

The results of the regression analyses for the eight criterion variables using the three demographic predictors and then the full array of eight risk and three protective factors are shown in Table 3-1. In this display, only the magnitude of the multiple correlation is shown for the two stages of the regression analyses, along with the sample size in each MLR.

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<sup>1</sup> Race/ethnicity was simply coded dichotomously as white or nonwhite due to the small sample sizes in some of the specific minority groups.

Table 3-1

**Magnitude of Multiple Correlations of Demographic and  
Risk and Protective Factors With  
ATOD Use and Violence in Peer-Individual Domain**

	Multiple Correlation (and R Squared) with Demographics Alone	Multiple Correlation (and R Squared) After Adding Risk and Protective Factors	Sample Size
Alcohol Use Scale	.34 (.12)	.72 (.52)	2,584
Binge Drinking	.20 (.04)	.58 (.34)	2,584
30-Day Cigarette Use	.18 (.03)	.45 (.20)	2,584
30-Day Smokeless Tobacco Use	.23 (.05)	.48 (.23)	2,584
Drug Use Scale	.28 (.08)	.76 (.58)	2,584
30-Day Marijuana Use	.22 (.05)	.68 (.46)	2,584
Violent Behavior Scale	.27 (.07)	.67 (.45)	2,584
Weapon Carrying	.23 (.05)	.53 (.28)	2,584

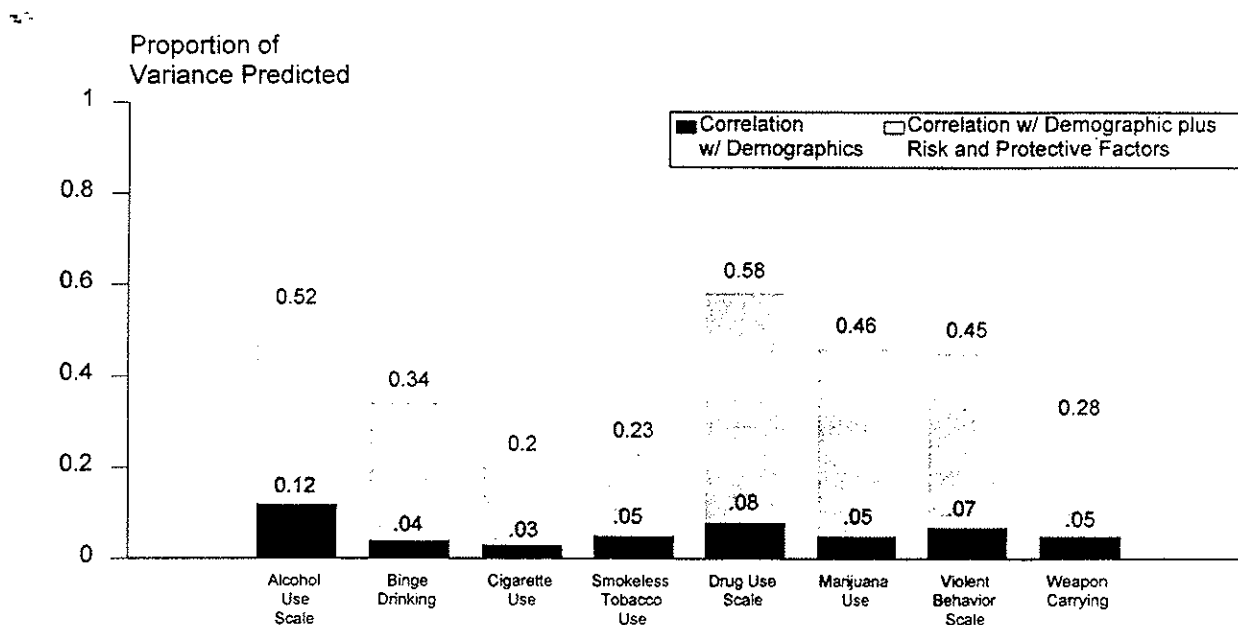
The squared multiple correlations in Table 3-1 indicate the proportion of variance in the criterion variable (alcohol use, drug use, etc.) that is predicted by the predictor variables used in the MLR. Two stages of the regression analysis are shown. First, the multiple correlation due to the demographic variables alone (gender, race, and grade level) is shown, followed by the multiple correlation using all available predictor variables (demographic plus all risk and protective factors in this domain). Squared multiple correlations are also shown in the table, because they indicate the proportion of shared variance between predictors and criterion.

In general, demographic variables account for less than 10 percent of the variance in health risk behaviors, with the exception of alcohol use, where they account for 12 percent. In contrast, consideration of risk and protective factors in this domain boosts the predictability of the health risk behaviors to 40 to 50 percent of the variance in many cases. Predictability is generally greatest when composite scales are used as criteria (alcohol use scale, drug use scale, violent

risk behaviors to 40 to 50 percent of the variance in many cases. Predictability is generally greatest when composite scales are used as criteria (alcohol use scale, drug use scale, violent behavior scale) rather than specific behaviors (30-day marijuana use, etc.). This is because these composites include a number of related behaviors and generally comprise a more comprehensive and reliable expression of the health risk behavior of interest.

Students' illicit drug use is the most predictable of the health risk behaviors, followed closely by alcohol use. In general, the peer-individual risk and protective factors add three to six times the predictability provided by demographics alone. Tobacco use, both smoking and smokeless, are least predictable, sharing only about 20 percent of their variance with the predictor set. Still, risk and protective factors in this domain account for three to five times more of the variance in these behaviors than do demographic variables. This relationship is shown most clearly in Figure 3-1. The shaded area in each bar represents the proportion of variance in each health risk behavior predicted through demographic characteristics alone. The full bar represents the total proportion of predicted variance due to demographics and risk and protective factors. Clearly, having information on peer-individual risk and protection in young people tells us a great deal more about their likelihood of engaging in health risk behaviors than their background or demographic characteristics alone.

**Figure 3-1 Predictable Variance in Selected Health Risk Behaviors Due to Demographic and Peer-Individual Risk and Protective Factors**



Note: Multiple correlations based on 2,584 students in Grades 6, 8, 10, and 12.

Given this overview of the multiple correlations of demographics and risk and protective factors with the eight health risk behaviors under study, these behaviors will be discussed individually in terms of the most significant of the predictive influences found in the multiple linear regression analyses.

### Alcohol Use

As noted earlier, alcohol use shows the strongest relationship with background/demographic factors, and is also highly predictable through the use of peer-individual risk and protective factors. In Table 3-2, the standardized regression weights, t-statistics, and significance levels of



all predictor variables are shown for both the alcohol use composite and binge drinking. These are the statistics corresponding to the final MLR equation. Blank entries in some of the risk and protective factors are used when that particular predictor variable was not included in the prediction equation because it did not add significantly to the predictability once the other predictors were included. To ensure that these relationships were assessed after partialling out differences in students' backgrounds, all three demographic predictors were included in the regression equation, whether they contributed significant influence or not.

Table 3-2

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of Alcohol Use**

Peer-Individual Domain

	Alcohol Use Composite			Binge Drinking		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
Demographics						
Gender	-.06	-4.09	<b>&lt;.01</b>	-.03	-1.77	.08
Minority	-.02	-1.23	.22	-.01	-.84	.40
Grade Level	.14	9.39	<b>&lt;.01</b>	.07	3.77	<b>&lt;.01</b>
Risk/Protective Factors						
Alienation and Rebelliousness	.06	3.61	<b>&lt;.01</b>			
Early Initiation of Problem Behavior	.32	18.08	<b>&lt;.01</b>	.10	4.86	<b>&lt;.01</b>
Antisocial Behavior	.09	5.46	<b>&lt;.01</b>	.25	12.77	<b>&lt;.01</b>
Students' Attitudes Favorable Toward Antisocial Behavior				.06	3.14	<b>&lt;.01</b>
Students' Attitudes Favorable Toward Drug Use	.09	5.02	<b>&lt;.01</b>	.13	6.41	<b>&lt;.01</b>
Interaction with Antisocial Peers						
Friends' Use of Drugs	.19	11.11	<b>&lt;.01</b>	.04	2.18	.03
Sensation Seeking	.08	5.49	<b>&lt;.01</b>	.04	2.40	.02
Reward for Conventional Involvement (P)	-.05	-3.33	<b>&lt;.01</b>	-.10	-5.72	<b>&lt;.01</b>
Belief in the Moral Order (P)						
Positive Social Skills (P)	-.11	6.18	<b>&lt;.01</b>	-.12	-5.69	<b>&lt;.01</b>
Total Multiple Correlation (Squared)	.72 (.52)			.58 (.34)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

Among the demographic factors, only grade level evidences a significant relationship with both alcohol use and binge drinking. This is simply restating the well-documented relationship that, as students get older, a higher percentage of them use alcohol and use it heavily. Given this understanding, the risk and protective factors' relationships indicate which of these influences are most highly related to drinking behavior as students get older. Gender is also significantly related to binge drinking, indicating that females are more likely to engage in binge drinking than males, once all other peer-individual factors are accounted for. This is quite contrary to the simple correlation, which indicates boys drink more heavily than girls. The current findings suggest there are likely such strong gender differences in risk and protective factors that girls who are at the same level of risk are actually more likely to binge drink than boys.

In terms of general use of alcohol (the alcohol use scale), the single most influential risk or protective factor is early initiation. That is, the earlier a student begins experimenting with alcohol, the more likely he or she will be to use moderately or heavily in later years. In terms of very heavy use—binge drinking—the strongest predictor is students engaging in antisocial behavior (using drugs, bringing weapon to school, being suspended from school, etc.). This evidences the strong interrelationship of these problem behaviors. That is, students who engage in the range of antisocial behaviors are more likely to binge drink.

Other influential predictors of alcohol use are having lots of friends who use drugs and having poor social skills (scoring low on this protective factor). While other risk and protective factors are statistically significant, they evidence far lower predictive influences on alcohol use than does the early initiation factor cited above.

Secondary influences on binge drinking include having favorable attitudes toward drug use, showing poor social skills, early initiation, and not experiencing rewards for being involved in conventional behaviors (i.e., not feeling “cool” for smoking, drinking and using drugs). While these are significantly less influential than the primary predictor of binge drinking (engaging in

the full range of antisocial behaviors), it is noteworthy that two protective factors are among the five most significant predictors. Those students who show positive social skills and assert that they don't think they would be seen as "cool" if they engaged in these health risk behaviors are significantly less likely to binge drink.

## **Tobacco Use**

In Table 3-3, the MLR results for tobacco use—cigarettes and smokeless tobacco—in the past 30 days are presented. As noted earlier, these are the least predictable of the health risk behaviors presented here. This may be due, in part, to the fact that they are single items and very specific behaviors (unlike the alcohol use and drug use scales). It is not likely that this low predictability is due to the fact that so many young people are smoking that none of the predictive factors presented here help determine who smokes and who doesn't. In fact, tobacco use is far less prevalent than alcohol use and, at some grade levels, marijuana use. We saw strong predictability of alcohol use above, so it is unlikely that lower predictability of tobacco use is due to its high prevalence rate.

Table 3-3

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of 30-Day Cigarette and Smokeless Tobacco Use**

## Peer-Individual Domain

	Cigarettes			Smokeless Tobacco		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
<b>Demographics</b>						
Gender	-0.07	-4.42	<b>&lt;.01</b>	.08	4.30	<b>&lt;.01</b>
Minority	-0.04	-2.22	.03	-0.02	-1.00	.31
Grade Level	.18	3.39	<b>.01</b>	.23	4.90	<b>&lt;.01</b>
<b>Risk/Protective Factors</b>						
Alienation and Rebelliousness						
Early Initiation of Problem Behavior	.12	6.39	<b>&lt;.01</b>	.07	3.15	<b>&lt;.01</b>
Antisocial Behavior	.22	11.56	<b>&lt;.01</b>	.15	6.93	<b>&lt;.01</b>
Students' Attitudes Favorable Toward Antisocial Behavior	.05	2.74	<b>.01</b>	.09	4.30	<b>&lt;.01</b>
Students' Attitudes Favorable Toward Drug Use	.20	9.96	<b>&lt;.01</b>	.09	3.99	<b>&lt;.01</b>
Interaction with Antisocial Peers	.15	7.91	<b>&lt;.01</b>	.06	2.67	<b>.01</b>
Friends' Use of Drugs						
Sensation Seeking				.04	2.04	.04
Reward for Conventional Involvement (P)	-0.13	-7.82	<b>&lt;.01</b>	-0.09	-4.76	<b>&lt;.01</b>
Belief in the Moral Order (P)						
Positive Social Skills (P)				-0.09	-4.10	<b>&lt;.01</b>
Total Multiple Correlation (Squared)	.45 (.20)			.48 (.23)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

Two of the demographic factors—gender and grade level—are significantly predictive of both forms of tobacco use. After accounting for all other peer-individual risk and protective factors, girls are more likely to smoke cigarettes and boys are more likely to use smokeless tobacco. Grade level shows its traditional relationship with all forms of ATOD use—as students progress through these developmental years they are increasingly likely to smoke cigarettes and use smokeless tobacco.

In predicting cigarette use, there is less of a distinction between the single strongest predictor and other significant predictors (unlike the pattern described above for alcohol use). Again, engaging in antisocial behavior and having favorable attitudes toward drug use are two potent predictors, followed by interacting with antisocial peers and feeling “cool” when engaging in these behaviors. Smokeless tobacco is somewhat different. Engaging in antisocial behavior in general is the strongest predictor, and it stands out more from the other predictors than was the case for cigarette smoking. Several other risk and protective factors add significantly to this prediction, but exhibit relatively small relationships with smokeless tobacco use.

Early initiation of this behavior is less influential than was the case for alcohol use, but the notion of the interrelationships of all of these health risk behaviors during these developmental times is again reinforced with the predictive power shown by the antisocial behavior risk factor. This continues to reinforce the “problem behavior” theory advanced many years ago by Jessor and Jessor (1978) among others who cautioned against attempts to isolate any of these behaviors, ignoring their influence on each other. Again, it suggests that prevention efforts are best advised to be sensitive to the need to embrace all of these behaviors—alcohol use, drug use, violent behavior, and delinquent behavior—to achieve reductions in any one of them.

## Illicit Drug Use

In Table 3-4, the MLR results for the prediction of illicit drug use behaviors—both the drug use composite and 30-day marijuana use—are shown. As observed earlier, illicit drug use evidences the highest predictability—both in terms of the composite scale and specific behavior selected for this analysis (30-day marijuana use)—of all health risk behaviors included here. This is some testimony to the utility of the risk and protective factor framework for these behaviors above all others. Although alcohol use is also highly predictable, more of its variance is due to demographic influences (12 percent) than is the case with drug use (8 percent). As shown earlier in Figure 3-1, a full 50 percent of the variance in drug use is predicted through information provided by the risk and protective factors.

Table 3-4

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of Drug Use**

Peer-Individual Domain

	Drug Use Composite			30-Day Marijuana Use		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
<b>Demographics</b>						
Gender	-.06	-4.43	<b>&lt;.01</b>	-.03	-1.88	.06
Minority	-.03	-2.25	.02	-.02	-1.46	.14
Grade Level	.28	5.43	<b>&lt;.01</b>	.22	4.88	<b>&lt;.01</b>
<b>Risk/Protective Factors</b>						
Alienation and Rebelliousness	.04	3.02	<b>&lt;.01</b>	.04	2.40	.02
Early Initiation of Problem Behavior	.25	14.78	<b>&lt;.01</b>	.06	3.55	<b>&lt;.01</b>
Antisocial Behavior	.26	16.56	<b>&lt;.01</b>	.37	20.63	<b>&lt;.01</b>
Students' Attitudes Favorable Toward Antisocial Behavior						
Students' Attitudes Favorable Toward Drug Use	.23	14.50	<b>&lt;.01</b>	.24	13.22	<b>&lt;.01</b>
Interaction with Antisocial Peers	.10	6.54	<b>&lt;.01</b>	.13	7.26	<b>&lt;.01</b>
Friends' Use of Drugs	.07	4.16	<b>&lt;.01</b>			
Sensation Seeking				.03	2.11	.03
Rewards for Conventional Involvement (P)	-.03	-2.18	.03	-.04	-2.66	.01
Belief in the Moral Order (P)						
Positive Social Skills (P)	-.07	-4.61	<b>&lt;.01</b>		8.68	<b>&lt;.01</b>
Total Multiple Correlation (Squared)	.76 (.58)			.68 (.46)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.



Both gender and grade level are significantly related to the drug use composite, but only grade level relates to marijuana use. In general, females are more likely to use drugs than are males—again, once all risk and protective factors are taken into account. As noted repeatedly, students at higher grade levels are more likely to use drugs in general, and marijuana specifically, than are students at lower grades.

There are three very strong predictors among risk and protective factors with the drug use composite scale—engaging in antisocial behavior, early initiation of problem behavior, and favorable attitudes toward drug use. Less influential, although statistically significant, are interacting with antisocial peers, friends' use of drugs, and having poor social skills. This hierarchy of predictive power may suggest that intra-individual factors—attitudes, engaging in the behavior itself—are more influential in predicting drug use than are peer-related factors—interacting with antisocial peers, having friends who use drugs, and knowing what to do in social situations.

When looking at marijuana use specifically, engaging in the full spectrum of antisocial behavior is by far the strongest predictor. Having favorable attitudes is next, and interacting with antisocial peers follows. Both of these are considerably less influential than engaging in antisocial behavior, however.

## **Violent Behavior**

Results of the multiple linear regression of the violent behavior composite scale and weapon carrying on demographic and risk and protective factors are shown in Table 3-5. Again the composite index, by virtue of its inclusion of an array of related behaviors, is more highly predictable than the single behavior of weapon carrying.

Table 3-5

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of Violent Behavior and Weapon Carrying**

## Peer-Individual Domain

	Violent Behavior Composite			Weapon Carrying		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
<b>Demographics</b>						
Gender	.14	9.54	<b>&lt;.01</b>	.13	7.47	<b>&lt;.01</b>
Minority	.03	1.91	.06	.03	1.94	.05
Grade Level	-.09	-5.81	<b>&lt;.01</b>	-.06	6.06	<b>&lt;.01</b>
<b>Risk/Protective Factors</b>						
Alienation and Rebelliousness	.10	5.81	<b>&lt;.01</b>	.12	6.06	<b>&lt;.01</b>
Early Initiation of Problem Behavior	.19	9.72	<b>&lt;.01</b>	.10	4.65	<b>&lt;.01</b>
Antisocial Behavior	.34	19.09	<b>&lt;.01</b>	.16	7.68	<b>&lt;.01</b>
Students' Attitudes Favorable Toward Antisocial Behavior	.16	8.86	<b>&lt;.01</b>	.13	5.97	<b>&lt;.01</b>
Students' Attitudes Favorable Toward Drug Use	-.07	-3.53	<b>&lt;.01</b>	-.06	-2.54	.01
Interaction with Antisocial Peers				.07	3.28	<b>&lt;.01</b>
Friends' Use of Drugs	.05	2.84	<b>&lt;.01</b>	.06	2.81	.01
Sensation Seeking						
Rewards for Conventional Involvement (P)	-.09	-5.92	<b>&lt;.01</b>	-.07	-3.76	<b>&lt;.01</b>
Belief in the Moral Order (P)				-.04	-1.99	.05
Positive Social Skills (P)	-.04	-2.16	.03	-.06	-2.68	.01
Total Multiple Correlation (Squared)	.67 (.45)			.53 (.28)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

In predicting violent behavior and weapon carrying, both gender and grade level are significant background influences, after removing the influence of the peer-individual risk and protective factors, while minority status is not. In general, boys are far more likely to engage in violent behavior or carry weapons than are girls. Unlike ATOD use, gender is the single strongest predictor among the three demographic variables of violent behavior. While grade level is a significant predictor of violence, as it was with all forms of ATOD use studied here, the relationship is quite different. While ATOD use increases as students get older, physical fighting and weapon carrying decrease. In fact, as reported in the *Analytic Report* of WSSAHB findings (Gabriel, et al., 1995), these behaviors reach their peak among eighth graders and decline through the high school years. These trends are not unique to Washington, but are also found in the national *Youth Risk Behavior Survey* (CDC, 1993) as well.

Beyond these demographics, several risk and protective factors contribute to the strong predictability of violent behavior in general ( $R=.67$ ) and somewhat lower predictability of weapon carrying in particular ( $R=.53$ ). Engaging in antisocial behavior is again the single strongest predictor of both of these indicators of violent behavior. In terms of the violent behavior composite scale, early initiation of the problem behavior and favorable attitudes toward antisocial behavior are also significant predictors, but have far less predictive influence than engaging in antisocial behavior itself. Weapon carrying, on the other hand, is also predicted strongly by antisocial behavior, attitudes favorable toward antisocial behavior in general and alienation and rebelliousness in particular, and early initiation of problem behaviors.

Another distinction in predicting violent behavior not seen in ATOD use is the relative diffusion of predictability of the specific behavior—weapon carrying—among nearly the full set (all but one) of the risk and protective factors. The composite scale, like many of the ATOD use measures, has most of its predictability loaded in three predictors, but the prediction of weapon carrying involves more subtle increments in predictive power through nearly the full range of risk and protective factors.

## Family Risk and Protective Factors

Results of the multiple linear regression analysis for the eight health risk behaviors using the three demographic predictors and the full array of five risk and two protective factors in the family domain are shown in Table 3-6. Again, the MLR results are shown in two stages—including only demographic variables, followed by the full set of predictors including all risk and protective factors in this domain.

Table 3-6

### Magnitude of Multiple Correlations of Demographic and Risk and Protective Factors With ATOD Use and Violence in Family Domain

	Multiple Correlation (and R Squared) with Demographics Alone	Multiple Correlation (and R Squared) After Adding Risk and Protective Factors	Sample Size
Alcohol Use Scale	.34 (.12)	.59 (.35)	2,169
Binge Drinking	.20 (.04)	.45 (.20)	2,169
30-Day Cigarette Use	.18 (.03)	.45 (.20)	2,169
30-Day Smokeless Tobacco Use	.23 (.05)	.39 (.15)	2,169
Drug Use Scale	.28 (.08)	.57 (.32)	2,169
30-Day Marijuana Use	.22 (.05)	.45 (.20)	2,169
Violent Behavior Scale	.27 (.07)	.46 (.21)	2,169
Weapon Carrying	.23 (.05)	.39 (.15)	2,169

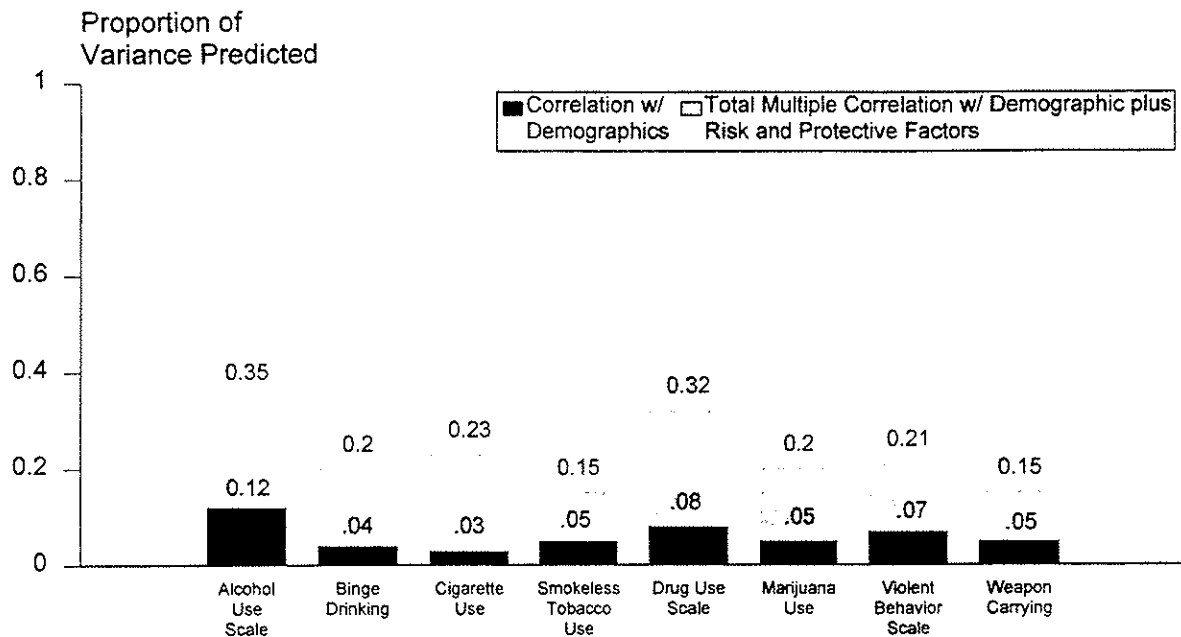
As expected, the multiple correlations of health risk behaviors with the three demographic indicators used in these analyses are the same as already viewed in the peer-individual domain. None of this background information varies by risk/protective domain, so the strength of the relationships remains the same. Furthermore, since these predictors were always included first in the stepwise multiple regression analysis, the magnitude of the multiple correlations between the

demographic factors and health risk behaviors will also remain the same in all domains. However, the influence of each factor as a predictor in the full MLR equation may vary from that seen in other domains because the risk and protective factors and their influences on health risk behaviors (and intercorrelations with demographics) will differ. Therefore, in discussing the results for each health risk behavior, we will continue to comment on the relative influences of each demographic factor.

In general, the predictability of health risk behaviors through risk and protective factors is not as strong in the family domain as in the peer-individual domain. The most predictable behaviors are again alcohol and drug use composites, but these multiple correlations are just under .60, while in the peer-individual domain they were above .70. Still, these results suggest strong predictability of these health risk behaviors through family influences.

In Figure 3-2, the contrast in predictable variance due to demographic influences and risk and protective factors is presented. Given that the predictable variation due to demographics is unchanged from that in the peer-individual domain and that the total multiple correlations are somewhat lower in the family domain, it must be the case that the influence of risk and protective factors on health risk behaviors is also lower here. Still, however, the influence of family risk and protective factors is often three to four times that of background/demographic influences across the health risk behaviors studied here.

Figure 3-2 Predictable Variance in Selected Health Risk Behaviors Due to Demographic and Family Risk and Protective Factors



Note: Multiple correlations based on 2,169 students in Grades 6, 8, 10, and 12.

### Alcohol Use

In Table 3-7, the MLR results in the prediction of alcohol use and binge drinking are presented. In the family domain, alcohol use has the strongest relationship to risk and protective factors of any of the other health risk behaviors. Approximately one-third of its variance is predicted through information on risk and protective factors.

Table 3-7

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of Alcohol Use**

Family Domain

	Alcohol Use Composite			Binge Drinking		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
<b>Demographics</b>						
Gender	.01	.71	.48	.04	1.86	.06
Minority	-.02	-1.31	.19	.00	.02	.99
Grade Level	.19	9.71	<b>&lt;.01</b>	.09	4.27	<b>&lt;.01</b>
<b>Risk/Protective Factors</b>						
Family Management				.08	3.64	<b>&lt;.01</b>
Family Discipline	.20	9.71	<b>&lt;.01</b>	.12	5.27	<b>&lt;.01</b>
History of Antisocial Behavior	.29	14.77	<b>&lt;.01</b>	.13	6.40	<b>&lt;.01</b>
Parent Attitudes Favorable Toward Antisocial Behavior	.17	9.40	<b>&lt;.01</b>	.26	12.91	<b>&lt;.01</b>
Family Attachment				.10	4.73	<b>&lt;.01</b>
Opportunities for Positive Involvement	-.09	-4.44	<b>&lt;.01</b>			
Rewards for Conventional Involvement	-.06	-2.71	<b>.01</b>			
Total Multiple Correlation (Squared)	.59 (.35)			.45 (.20)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

Demographic influences on alcohol use are less potent when accounting for other family influences than was seen in the peer-individual domain. In the family domain, only grade level is a significant predictor of alcohol use and binge drinking. Again, it indicates that older students are more likely to drink and drink heavily than are younger students.

Among risk and protective factors in this domain, a history of antisocial behavior (parents or siblings engaging in drug use, heavy drinking, or weapon carrying) is the single strongest predictor of alcohol use, while parent attitudes (as perceived by the student) favorable toward antisocial behavior in general is the strongest predictor of binge drinking. Family discipline (students' perception of being likely to be caught by their parents if they drank, skipped school, or carried a handgun) is also a relatively strong predictor of alcohol use. Those students who were less likely to feel these consequences from their parents were more likely to drink. Other predictors of binge drinking were far less influential than parent attitudes toward antisocial behavior, cited above. This reinforces the strong message being sent to parents—that the kinds of attitudes and expectations they communicate to their children do, in fact, have a great deal of influence on their behavior. Although the strongest relationships with these health risk behaviors are in the peer-individual domain as previously noted, the relationships described here affirm the strong, positive influence family attitudes and behaviors have on these young people.

## **Tobacco Use**

In Table 3-8, the MLR results predicting 30-day use of cigarettes and smokeless tobacco are presented. While these multiple correlations are again lower than those in evidence for composite indices of alcohol and other drug use, the discrepancy is not as large as was seen in the peer-individual domain. That is, it appears that family influences are nearly as strong on tobacco use as they are for alcohol and other drug use.



Table 3-8

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of 30-Day Cigarette and Smokeless Tobacco Use**

Family Domain

	Cigarettes			Smokeless Tobacco		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
<b>Demographics</b>						
Gender	.00	-12	.90	.14	6.71	<.01
Minority	-.01	-4.9	.63	.00	-.19	.85
Grade Level	.09	4.43	<.01	.10	4.63	<.01
<b>Risk/Protective Factors</b>						
Family Management	.14	6.54	<.01	.07	3.06	<.01
Family Discipline	.06	2.79	.01	.05	2.24	.03
History of Antisocial Behavior	.14	6.91	<.01	.13	6.07	<.01
Parent Attitudes Favorable Toward Antisocial Behavior	.25	12.78	<.01	.21	10.42	<.01
Family Attachment						
Opportunities for Positive Involvement	-.09	-4.25	<.01			
Rewards for Conventional Involvement				-.04	-2.11	.04
Total Multiple Correlation (Squared)	.45 (.20)			.39 (.15)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

Among the demographic influences, only grade level is a significant predictor of both cigarette and smokeless tobacco use, while gender is a significant predictor of smokeless tobacco use. In general, older students are more likely to use tobacco of both types, and boys are more likely to use smokeless tobacco than girls. Interestingly, the gender difference in cigarette use noted in the peer-individual domain, drops out when other, more strongly related, family risk and protective factors are considered.

The single strongest predictor of both cigarette and smokeless tobacco use is parent attitudes perceived by the students to be favorable toward antisocial behavior in general. These attitudes (pertaining to smoking, drinking, fighting, drawing graffiti, etc.) are far more influential on students' tobacco use than are other predictors, although family management practices and a family history of antisocial behavior are also significant predictors of cigarette use. Again, the norms and expectations communicated by parents to their children have a strong influence on their likelihood to use tobacco.

### **Illicit Drug Use**

In Table 3-9, the results of the MLR predicting illicit drug use from demographic and family risk and protective factors are presented. While the predictability of the drug use composite is among the highest in this domain, it is considerably less than noted when peer-individual factors were considered. Similarly, the predictability of 30-day marijuana use is lower than that observed in the peer-individual domain, but on a par with tobacco use in this domain.

Table 3-9

### Regression Weights of Demographic and Risk and Protective Factors in the Prediction of Drug Use

#### Family Domain

	Drug Use Composite			30-Day Marijuana Use		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
Demographics						
Gender	.02	1.22	.22	.05	2.38	.02
Minority	-.01	-.79	.43	.00	.11	.81
Grade Level	.28	6.41	<b>&lt;.01</b>	.11	5.01	<b>&lt;.01</b>
Risk/Protective Factors						
Family Management	.10	5.14	<b>&lt;.01</b>	.10	4.65	<b>&lt;.01</b>
Family Discipline	.18	8.91	<b>&lt;.01</b>	.11	5.07	<b>&lt;.01</b>
History of Antisocial Behavior	.23	11.97	<b>&lt;.01</b>	.15	7.11	<b>&lt;.01</b>
Parent Attitudes Favorable Toward Antisocial Behavior	.23	12.56	<b>&lt;.01</b>	.23	11.41	<b>&lt;.01</b>
Family Attachment	.05	2.33	.02	.05	2.28	.02
Opportunities for Positive Involvement				-.05	-2.07	.04
Rewards for Conventional Involvement	-.06	-2.51	<b>.01</b>			
Total Multiple Correlation (Squared)	.57 (.32)			.45 (.20)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

Among demographic predictors, grade level evidences the only significant relationship. There are no gender or minority status differences in drug use after accounting for the influences of risk and protective factors in this domain. Again, this is different from what we saw in the peer-individual domain, where gender differences in composite drug use were observed. Apparently, other family influences can mitigate these tendencies for the greater likelihood of females to use illicit drugs.

A family history of antisocial behavior and student-perceived positive attitudes toward these behaviors (likely a function of those behaviors themselves in the students' eyes) are the strongest predictors of drug use, with poor family discipline somewhat less influential. For marijuana use specifically, perceived positive attitudes of the parents is the strongest predictor. Again, in both instances, what parents do and the attitude they communicate to their children are potent influences on the likelihood that they will use drugs.

### **Violent Behavior**

In Table 3-10, the results of the MLR on violent behavior in general and weapon carrying in particular with demographic and family-related risk and protective factors is presented. Again, the composite scale is more predictable than the specific behavior. However, violent behavior is considerably less predictable in the family domain ( $R=.46$ ,  $R^2=.21$ ) than it was in the peer-individual domain ( $R=.67$ ,  $R^2=.45$ ). In terms of predictable variance, it is less than half as predictable from the family influences included here. In the family domain, violent behavior in general is only as predictable as such specific behaviors as binge drinking, cigarette use, and marijuana use.

Table 3-10

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of Violent Behavior and Weapon Carrying**

Family Domain

	Violent Behavior Composite			Weapon Carrying		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
<b>Demographics</b>						
Gender	.22	11.48	<b>&lt;.01</b>	.19	9.30	<b>&lt;.01</b>
Minority	.06	3.23	<b>&lt;.01</b>	.06	2.89	<b>&lt;.01</b>
Grade Level	-.10	-4.96	<b>&lt;.01</b>	-.10	-3.22	<b>&lt;.01</b>
<b>Risk/Protective Factors</b>						
Family Management	.04	2.15	.03	.05	2.27	.02
Family Discipline	.16	7.28	<b>&lt;.01</b>	.16	6.82	<b>&lt;.01</b>
History of Antisocial Behavior	.15	7.36	<b>&lt;.01</b>	.13	6.24	<b>&lt;.01</b>
Parent Attitudes Favorable Toward Antisocial Behavior	.19	9.81	<b>&lt;.01</b>	.13	6.24	<b>&lt;.01</b>
Family Attachment						
Opportunities for Positive Involvement	-.09	-4.37	<b>&lt;.01</b>	-.08	-3.90	<b>&lt;.01</b>
Rewards for Conventional Involvement						
Total Multiple Correlation (Squared)	.46 (.21)			.39 (.15)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

In this domain, all demographic factors contribute significantly to the multiple correlation for both violent behavior and weapon carrying. For both behaviors, gender is by far the strongest correlate, indicating that males are more likely to engage in these behaviors than are females. Grade level is the next strongest influence. Again, as seen previously, students in lower grades

(6 and 8) are more likely than high school students to engage in the violent behaviors assessed in the WSSAHB. Finally, minority nonwhite students are more likely to engage in these behaviors than are white students. It is noteworthy that race was not a significant influence on violent behavior in the peer-individual domain, but it is in the family domain. This suggests that attitudinal and behavioral differences between white and nonwhites that are associated with violent behavior are captured more strongly by risk and protective factors (peer influences) in the peer-individual domain than they are in the family domain. This further suggests that these violence-related influences are found in the peer group, not the families of minority students.

Violent behavior in general is best predicted by perceived parent attitudes favorable toward antisocial behavior, followed closely by family discipline and a history of antisocial behavior. Weapon carrying is best predicted by family discipline followed by positive attitudes toward a history of antisocial behavior. By now, these are familiar relationships within the family domain—parent attitudes and the history of these behaviors by parents and siblings are strong determinants of student behaviors.

### **Community Risk and Protective Factors**

Results of the multiple linear regression analysis of the eight health risk behaviors on the three demographic, five risk, and one protective factors in the community domain are shown in Table 3-11. As noted in the previous section, the multiple correlations with demographic factors alone are the same as seen in the other domains.

Table 3-11

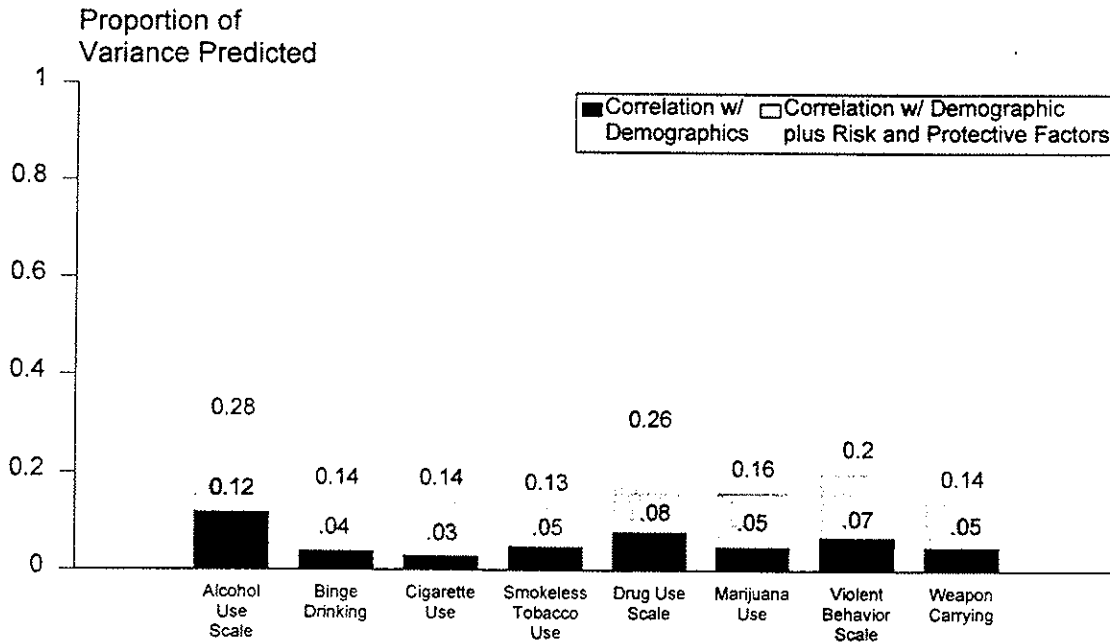
**Magnitude of Multiple Correlations of  
Demographic and Risk and Protective Factors  
With ATOD Use and Violence in Community Domain**

	Multiple Correlation (and R Squared) with Demographics Alone	Multiple Correlation (and R Squared) After Adding Risk and Protective Factors	Sample Size
Alcohol Use Scale	.34 (.12)	.53 (.28)	2,597
Binge Drinking	.20 (.04)	.37 (.14)	2,597
30-Day Cigarette Use	.18 (.03)	.38 (.14)	2,597
30-Day Smokeless Tobacco Use	.23 (.05)	.36 (.13)	2,597
Drug Use Scale	.28 (.08)	.51 (.26)	2,597
30-Day Marijuana Use	.22 (.05)	.40 (.16)	2,597
Violent Behavior Scale	.27 (.07)	.45 (.20)	2,597
Weapon Carrying	.23 (.05)	.38 (.14)	2,597

In general, the predictability of the eight health risk behaviors from risk and protective factors in this domain is somewhat lower than seen in the family domain, which was considerably lower than that of the peer-individual domain. The highest multiple correlations are again with the alcohol and drug use composites ( $R=.53$  and  $R=.51$ , respectively) followed closely by the violent behavior composite ( $R=.45$ ).

In Figure 3-3, the predicted variance in each of these health risk behaviors—from demographics and the full set of predictors—is shown. As the overall predictability decreases over that seen in previous domains, the proportion of variance predicted by risk and protective factors also decreases. For example, although alcohol use is the most predictable health risk behavior in this domain, demographic influences account for nearly half of the predicted variance. Across the other health risk behaviors, however, risk and protective factors generally account for about twice the variance in these behaviors over that accounted for by demographic influences.

Figure 3-3 Predicted Variance in Selected Health Risk Behaviors Due to Demographic and Community Risk and Protective Factors



Note: Multiple correlations based on 2,597 students in Grades 6, 8, 10, and 12.

### Alcohol Use

In Table 3-12, the multiple linear regression results of alcohol use and binge drinking on demographics and community-based risk and protective factors are shown. Just over one-fourth the variance in alcohol use is predicted through these influences, while that of the specific behavior of binge drinking is about half of that (14 percent).



Table 3-12

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of Alcohol Use**

Community Domain

	Alcohol Use Composite			Binge Drinking		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
Demographics						
Gender	.00	.26	.79	.04	2.15	.03
Minority	.00	-.28	.78	.01	.52	.61
Grade Level	.24	13.51	<b>&lt;.01</b>	.10	5.28	<b>&lt;.01</b>
Risk/Protective Factors						
Low Neighborhood Attachment						
Community Disorganization	.08	4.49	<b>&lt;.01</b>	.11	5.64	<b>&lt;.01</b>
Transition and Mobility	.05	2.78	<b>.01</b>	.04	2.19	.03
Community Laws and Norms	.12	6.73	<b>&lt;.01</b>	.18	9.07	<b>&lt;.01</b>
Perceived Availability of Drugs, Gangs, and Handguns	.32	17.87	<b>&lt;.01</b>	.17	8.63	<b>&lt;.01</b>
Rewards for Conventional Involvement	-.07	-3.81	<b>&lt;.01</b>			
Total Multiple Correlation	.53 (.28)			.37 (.14)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

Among the demographic influences, only grade level is significantly predictive of alcohol use in general and binge drinking in particular. As already seen, this reflects the well-known relationship of increasing alcohol use as students get older. Once the community risk and protective influences are considered, there are no differences between genders or due to minority status in these indicators of alcohol use.

Among the community influences on alcohol use, the perceived availability or access to the “agents” of these health risk behaviors—guns, drugs, gangs, etc.—is by far the most powerful predictor of alcohol use. Binge drinking is also strongly influenced by this factor, but is equally influenced by the perceived laws and norms in the community governing these behaviors. This again provides important direction to community-based prevention efforts to re-examine policies and practices around the accessibility of alcohol and other drugs and handguns and to clarify the norms and expectations around these behaviors. As noted in the family domain, young people need clear and consistent messages from adults as to the unacceptability of drinking.

## **Tobacco Use**

Table 3-13, the MLR results of 30-day cigarette and smokeless tobacco use on demographics and community risk and protective factors are given.

Table 3-13

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of 30-Day Cigarette and Smokeless Tobacco Use**

Community Domain

	Cigarette Use			Smokeless Tobacco Use		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
<b>Demographics</b>						
Gender	.00	-.26	.79	.13	7.18	<b>&lt;.01</b>
Minority	-.01	-.41	.68	.00	.06	.95
Grade Level	.10	5.17	<b>&lt;.01</b>	.10	5.07	<b>&lt;.01</b>
<b>Risk/Protective Factors</b>						
Low Neighborhood Attachment						
Community Disorganization	.10	5.25	<b>&lt;.01</b>	.08	4.13	<b>&lt;.01</b>
Transition and Mobility	.14	7.33	<b>&lt;.01</b>	.08	4.23	<b>&lt;.01</b>
Community Laws and Norms	.18	9.24	<b>&lt;.01</b>	.20	9.91	<b>&lt;.01</b>
Perceived Availability of Drugs, Gangs, and Handguns	.15	7.54	<b>&lt;.01</b>	.09	4.87	<b>&lt;.01</b>
Rewards for Conventional Involvement						
Total Multiple Correlation	.38 (.14)			.36 (.13)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

The predictability of both indicators of tobacco use from demographics and community-based risk and protective factors is similar to that observed for binge drinking, the other specific behavior examined thus far. Only 13 to 14 percent of the variance of smoking cigarettes or using smokeless tobacco is captured through these influences.

Again, grade level is a significant predictor of both cigarette and smokeless tobacco use, although not as strongly as seen with other health risk behaviors, particularly the composite indices. Gender differences exist in the use of smokeless tobacco, and these are more dramatic than those cited due to grade level. As seen earlier, males are considerably more likely to use smokeless tobacco than are females, even after taking into account the influence of community-level risk and protective factors.

Beyond the demographics, community laws and norms is the single most influential risk factor associated with both cigarette and smokeless tobacco use. Again, these behaviors are strongly related to the explicit and implicit messages conveyed to youth on the acceptability of using tobacco. Smoking cigarettes is also a function of perceived availability and transition and mobility, while these and other influences are less significant for smokeless tobacco use.

### **Illicit Drug Use**

In Table 3-14, the results of the multiple linear regression analysis of the composite scale of drug use and the 30-day marijuana use on demographic and community-based risk and protective factors are shown. Over one-fourth of the variance in drug use is predictable through these influences, while 16 percent of marijuana use can be predicted.

Table 3-14

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of Drug Use**

Community Domain

	Drug Use Composite			30-Day Marijuana Use		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
Demographics						
Gender	.02	1.16	.25	.05	2.52	<b>.01</b>
Minority	.00	-.10	.92	.01	.37	.71
Grade Level	.16	9.19	<b>&lt;.01</b>	.12	6.31	<b>&lt;.01</b>
Risk/Protective Factors						
Low Neighborhood Attachment						
Community Disorganization	.10	5.73	<b>&lt;.01</b>	.10	5.54	<b>&lt;.01</b>
Transition and Mobility	.08	4.56	<b>&lt;.01</b>	.08	4.44	<b>&lt;.01</b>
Community Laws and Norms	.20	11.03	<b>&lt;.01</b>	.19	9.75	<b>&lt;.01</b>
Perceived Availability of Drugs, Gangs, and Handguns	.25	13.87	<b>&lt;.01</b>	.05	8.04	<b>&lt;.01</b>
Rewards for Conventional Involvement	-.09	-4.92	<b>&lt;.01</b>	-.04	-2.09	.04
Total Multiple Correlation (Squared)	.51 (.26)			.40 (.16)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

Grade level is again a significant background influence of both illicit drug use behaviors. As students grow older they are progressively more likely to engage in drug use. Once these community influences are taken into account, marijuana use is also associated with gender. Males are more likely to smoke marijuana in the past 30 days than are females.

As seen in the prediction of cigarette use, both perceived availability and community laws and norms are significant predictors of drug use. Other risk and protective factors, while statistically significant, are less influential on these behaviors. In terms of marijuana use specifically, community laws and norms is the single strongest predictor, far outweighing the other influences.

## **Violent Behavior**

The MLR results of violent behavior and weapon carrying, as predicted by the demographic and risk and protective influences, are shown in Table 3-15. About 20 percent of the variance in the violent behavior composite is predicted through these influences, while about 14 percent of the variance in weapon carrying is accounted for.

Table 3-15

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of Violent Behavior and Weapon Carrying**

Community Domain

	Violent Behavior Composite			Weapon Carrying		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
<b>Demographics</b>						
Gender	.23	12.78	<b>&lt;.01</b>	.19	10.30	<b>&lt;.01</b>
Minority	.06	3.18	<b>&lt;.01</b>	.05	2.80	<b>.01</b>
Grade Level	-.08	-4.07	<b>&lt;.01</b>	-.04	-1.93	<b>.05</b>
<b>Risk/Protective Factors</b>						
Low Neighborhood Attachment				.04	2.11	<b>.03</b>
Community Disorganization	.15	8.35	<b>&lt;.01</b>	.13	6.64	<b>&lt;.01</b>
Transition and Mobility	.12	6.47	<b>&lt;.01</b>	.08	4.42	<b>&lt;.01</b>
Community Laws and Norms	.15	7.76	<b>&lt;.01</b>	.13	6.32	<b>&lt;.01</b>
Perceived Availability of Drugs, Gangs, and Handguns	.20	10.61	<b>&lt;.01</b>	.16	8.20	<b>&lt;.01</b>
Rewards for Conventional Involvement						
Total Multiple Correlation	.45 (.20)			.38 (.14)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

Unlike the other health risk behaviors studied in this domain, all three demographic characteristics are significant predictors of composite violent behavior. Gender is the strongest correlate—males engage in violent behavior more often than females—followed by grade level and minority status. Again, as seen in other domains, there is a negative partial correlation

between grade level and violent behavior. Physical fighting peaks at the eighth grade level and declines through high school. This same trend (though not statistically significant) is seen for weapon carrying as well. Finally, after accounting for all of the influences of community risk and protective factors, minority status is also a significant predictor of violent behavior—nonwhites engage in these behaviors more frequently than do white students.

Among risk and protective influences, several factors are strong predictors of violent behavior and weapon carrying. Perceived availability, community laws and norms, and community disorganization all share significant predictive influence with both of these indicators. The first two of these—perceived availability and laws and norms—have been seen repeatedly in the community domain. Community disorganization has yet to be discussed, however. These tap the perceptions of youth as to the frequency of such undesirable conditions in their community as abandoned buildings, graffiti, crime and/or drug selling, and fighting. To the extent these are visible in their communities, students are significantly more likely to engage in violence and carry weapons themselves.

### **School Risk and Protective Factors**

The overall magnitude of the multiple correlations of the eight health risk behaviors with demographic influences and the four risk and protective factors in the school domain are given in Table 3-16. In general, these are by far the lowest multiple correlations on these behaviors across all domains. The composite scales are typically the most highly predicted, but their predictability is very close to that evidenced for the specific behaviors.



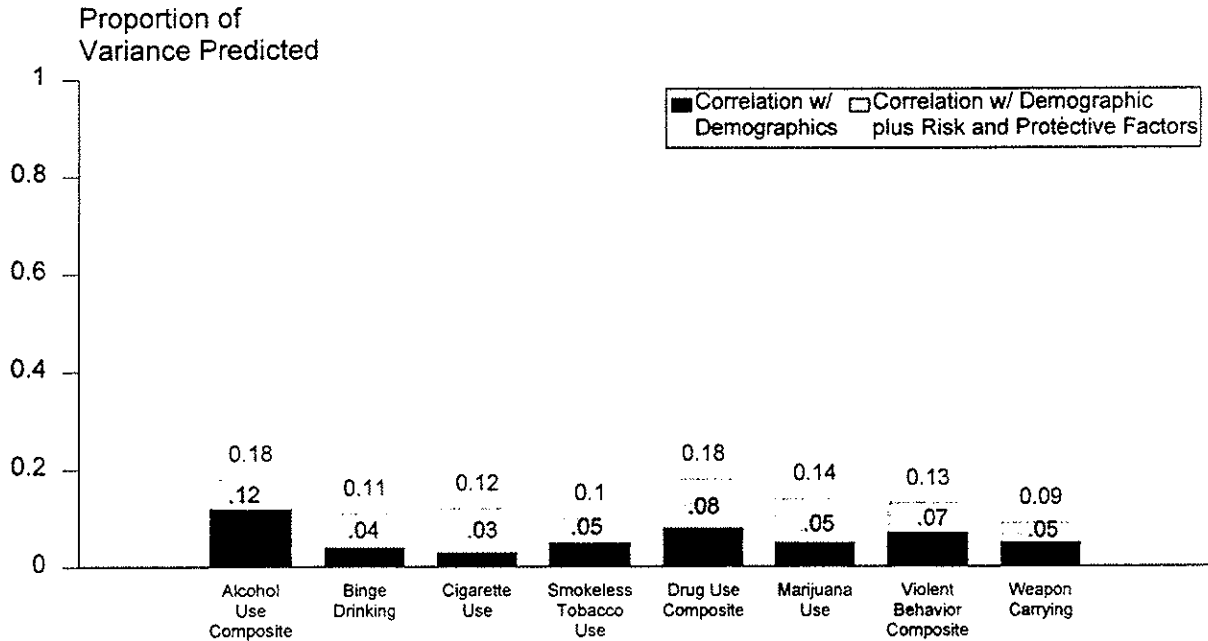
Table 3-16

**Magnitude of Multiple Correlations of  
Demographic and Risk and Protective Factors  
With ATOD Use and Violence in School Domain**

	Multiple Correlation (and R Squared) with Demographics Alone	Multiple Correlation (and R Squared) After Adding Risk and Protective Factors	Sample Size
Alcohol Use Scale	.34 (.12)	.42 (.18)	2,518
Binge Drinking	.20 (.04)	.33 (.11)	2,518
30-Day Cigarette Use	.18 (.03)	.34 (.12)	2,518
30-Day Smokeless Tobacco Use	.23 (.05)	.32 (.10)	2,518
Drug Use Scale	.28 (.08)	.42 (.18)	2,518
30-Day Marijuana Use	.22 (.05)	.37 (.14)	2,518
Violent Behavior Scale	.27 (.07)	.36 (.13)	2,518
Weapon Carrying	.23 (.05)	.30 (.09)	2,518

In Figure 3-4, the added predictability due to the school-based risk and protective factors over demographic influences is shown graphically for each of the eight health risk behaviors. This clearly indicates the relatively low influence of school-based factors on these health risk behaviors. Where the other domains frequently evidenced 40 to 50 percent of the variance in behavior predictable through these influences, none of the relationships in this domain exceed 20 percent predicted variance.

Figure 3-4 Predicted Variance in Selected Health Risk Behaviors Due to Demographic and School Risk and Protective Factors



Note: Multiple correlations based on 2,518 students in Grades 6, 8, 10, and 12.

### Alcohol Use

In Table 3-17, the specific MLR results of alcohol use and binge drinking on demographic and school-based risk and protective factors influences are given.

Table 3-17

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of Alcohol Use**

School Domain

	Alcohol Use Composite			Binge Drinking		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
<b>Demographics</b>						
Gender	.02	1.11	.27	.05	2.47	<b>.01</b>
Minority	.01	.73	.47	.02	.80	.43
Grade Level	.33	17.90	<b>&lt;.01</b>	.17	9.05	<b>&lt;.01</b>
<b>Risk/Protective Factors</b>						
Academic Failure	.14	7.45	<b>&lt;.01</b>	.16	7.87	<b>&lt;.01</b>
Little Commitment to School	.09	4.78	<b>&lt;.01</b>	.17	8.41	<b>&lt;.01</b>
Opportunities for Positive Involvement	-.06	-3.03	<b>&lt;.01</b>	-.05	-2.79	<b>.01</b>
Rewards for Conventional Involvement	-.07	-3.62	<b>&lt;.01</b>			
Total Multiple Correlation	.42 (.18)			.33 (.11)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

Grade level is again a significant predictor of both alcohol use and binge drinking—older students are more likely to drink and drink heavily than are younger students. Males are also more likely than females to engage in binge drinking.

Among the risk and protective influences, academic failure and low commitment to school are significant influences on both indicators of alcohol use. Students who perceive themselves as not

performing well in school and show low commitment to school are more likely to drink and drink heavily than are those students who are interested and see themselves performing acceptably.

## **Tobacco Use**

The MLR results on 30-day use of cigarettes and smokeless tobacco with demographic and school-based risk and protective factors are shown in Table 3-18. This predictability is in line with, but slightly lower than, results seen for the specific behaviors in other domains.

Table 3-18

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of 30-Day Cigarette and Smokeless Tobacco Use**

School Domain

	Cigarettes			Smokeless Tobacco		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
<b>Demographics</b>						
Gender	.00	<b>-0.04</b>	<b>.96</b>	.14	<b>7.31</b>	<b>&lt;.01</b>
Minority	.00	.23	.82	.01	.39	.69
Grade Level	.16	<b>8.42</b>	<b>&lt;.01</b>	.16	<b>8.18</b>	<b>&lt;.01</b>
<b>Risk/Protective Factors</b>						
Academic Failure	.21	<b>10.30</b>	<b>&lt;.01</b>	.14	<b>6.86</b>	<b>&lt;.01</b>
Little Commitment to School	.15	<b>7.76</b>	<b>&lt;.01</b>	.14	<b>6.99</b>	<b>&lt;.01</b>
Opportunities for Positive Involvement						
Rewards for Conventional Involvement						
Total Multiple Correlation	<b>.34 (.12)</b>			<b>.32 (.10)</b>		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

Consistent with other domains, grade level evidences a significant relationship to both indicators of tobacco use, and gender is a strong correlate of smokeless tobacco use. Older students are more likely to smoke cigarettes and use smokeless tobacco, and males are far more likely to use smokeless tobacco than are females.

Academic failure is the most potent predictor of smoking cigarettes, and smokeless tobacco use is influenced equally by it and low commitment to school. No protective influences are in evidence for these indicators of tobacco use.

## Illicit Drug Use

The MLR results for the composite indicator of drug use and the specific behavior of use of marijuana in the last 30 days on demographic and school-based risk and protective factors are given in Table 3-19. Unlike previous domains, there is little difference in the predictability of the composite (18 percent of its variance) and the specific behavior (14 percent). This is indicative of lower predictability of the composite, in comparison to that seen in other domains. Specific behaviors (i.e., marijuana use) have consistently shared 10 to 15 percent of their variance with demographic and risk and protective factors.

Table 3-19

**Regression Weights of Demographic and Risk and Protective Factors  
in the Prediction of Drug Use**

School Domain

	Drug Use Composite			30-Day Marijuana Use		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
<b>Demographics</b>						
Gender	.03	1.69	<b>-.09</b>	.05	2.72	<b>.01</b>
Minority	.02	.92	.36	.02	.96	.34
Grade Level	.26	14.09	<b>&lt;.01</b>	.19	10.18	<b>&lt;.01</b>
<b>Risk/Protective Factors</b>						
Academic Failure	.19	10.03	<b>&lt;.01</b>	.17	8.81	<b>&lt;.01</b>
Little Commitment to School	.15	7.97	<b>&lt;.01</b>	.17	8.80	<b>&lt;.01</b>
Opportunities for Positive Involvement	-.08	-4.09	<b>&lt;.01</b>	-.07	-4.00	<b>&lt;.01</b>
Rewards for Conventional Involvement	-.06	-2.74	<b>.01</b>			
Total Multiple Correlation	.42 (.18)			.37 (.14)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.

Grade level is again the strongest demographic influence, although gender is also a significant correlate of marijuana use, with males more likely than females to smoke marijuana.

In terms of the composite index of drug use, academic failure is the strongest predictor; marijuana use is predicted equally well by this factor and low commitment to school.

## Violent Behavior

The MLR results for violent behavior and weapon carrying on demographic and school-based risk and protective factors are given in Table 3-20. These are the least predictable of all health risk behaviors in this domain.

Table 3-20  
**Regression Weights of Demographic and Risk and Protective Factors  
 in the Prediction of Violent Behavior and Weapon Carrying**

### School Domain

	Violent Behavior Composite			Weapon Carrying		
	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>	Regression Weight	t Statistic	Significance Level (p) <sup>1</sup>
<b>Demographics</b>						
Gender	.24	12.56	<.01	.20	10.32	<.01
Minority	.08	4.27	<.01	.08	3.93	<.01
Grade Level	-.01	-.56	.57	.02	.92	.36
<b>Risk/Protective Factors</b>						
Academic Failure	.15	7.74	<.01	.14	7.00	<.01
Little Commitment to School	.12	5.89	<.01	.07	3.69	<.01
Opportunities for Positive Involvement				-.06	-3.32	<.01
Rewards for Conventional Involvement	-.06	-3.31	<.01			
Total Multiple Correlation	.36 (.13)			.30 (.09)		

<sup>1</sup>Statistically significant predictors (p<.01) are in bold.



Unlike all other health risk behaviors in this domain, grade level is not a significant correlate with violence. Where a negative relationship has been in evidence in other domains (declining violence and weapon carrying in high school), the other school-based influences (risk and protective factors) have accounted for this trend. In contrast, both gender and racial minority factors are significant influences on these behaviors. After taking into account their differences on the school-based risk and protective factors, males and minority groups engage in violence more frequently than do females and white nonminority students.

Again, academic failure is the strongest predictor of both behaviors. Low commitment to school is also highly significant in predicting violent behavior, but less so for weapon carrying.

## **Summary and Discussion**

In reviewing the volumes of multiple correlations and regression analyses, several observations seem noteworthy.

First, as initially seen in the simple correlation analysis in the *Analytic Report* (Gabriel, et al., 1995), the magnitude of the relationships between health risk behaviors and risk and protective factors has a clear pattern. Peer-individual factors are most strongly related, followed by the family, the community and, lastly, the school. This ordering is shown graphically in Figures 3-5a and 3-5b. The differences are perhaps most dramatic in the areas of illicit drug use and violent behavior. Where peer-individual influences often account for nearly 50 percent of the variance of these behaviors, other domains' factors amount to 20 to 30 percent of this predictability.

Figure 3-5a Squared Multiple Correlations of Alcohol and Tobacco Use With Risk and Protective Factors by Domain

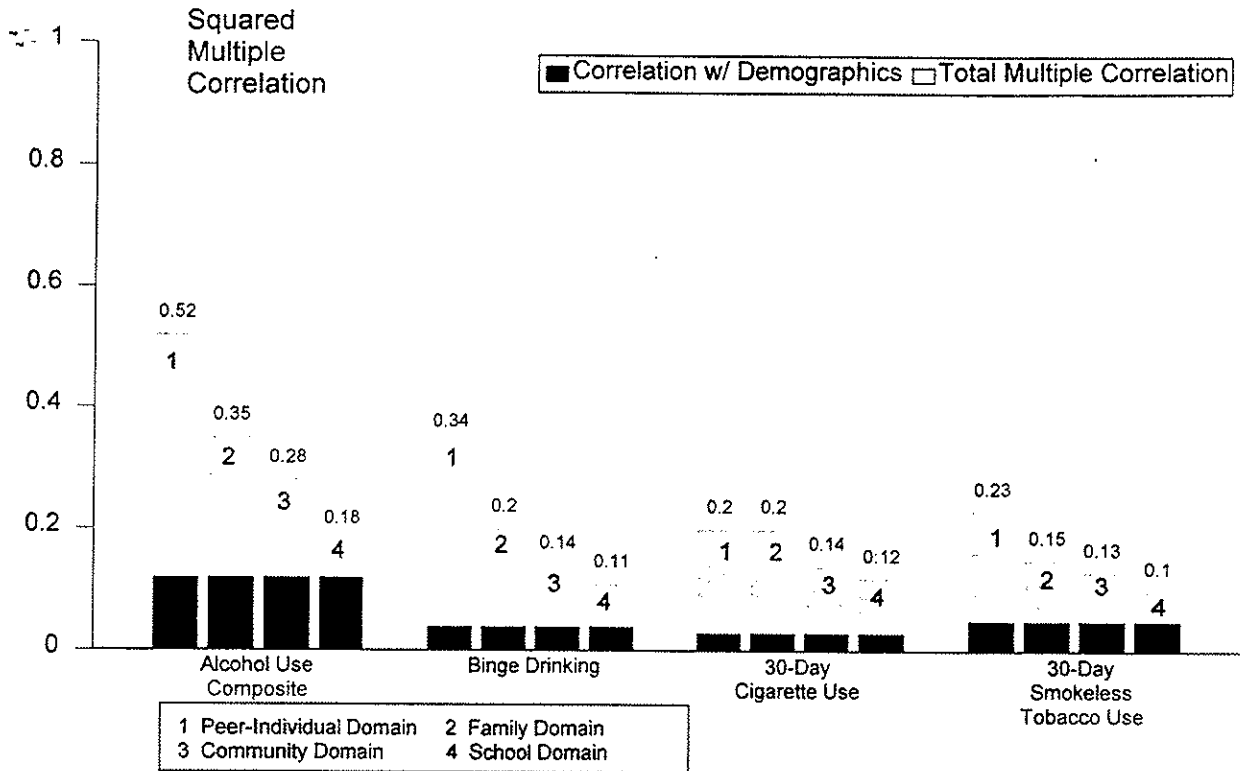
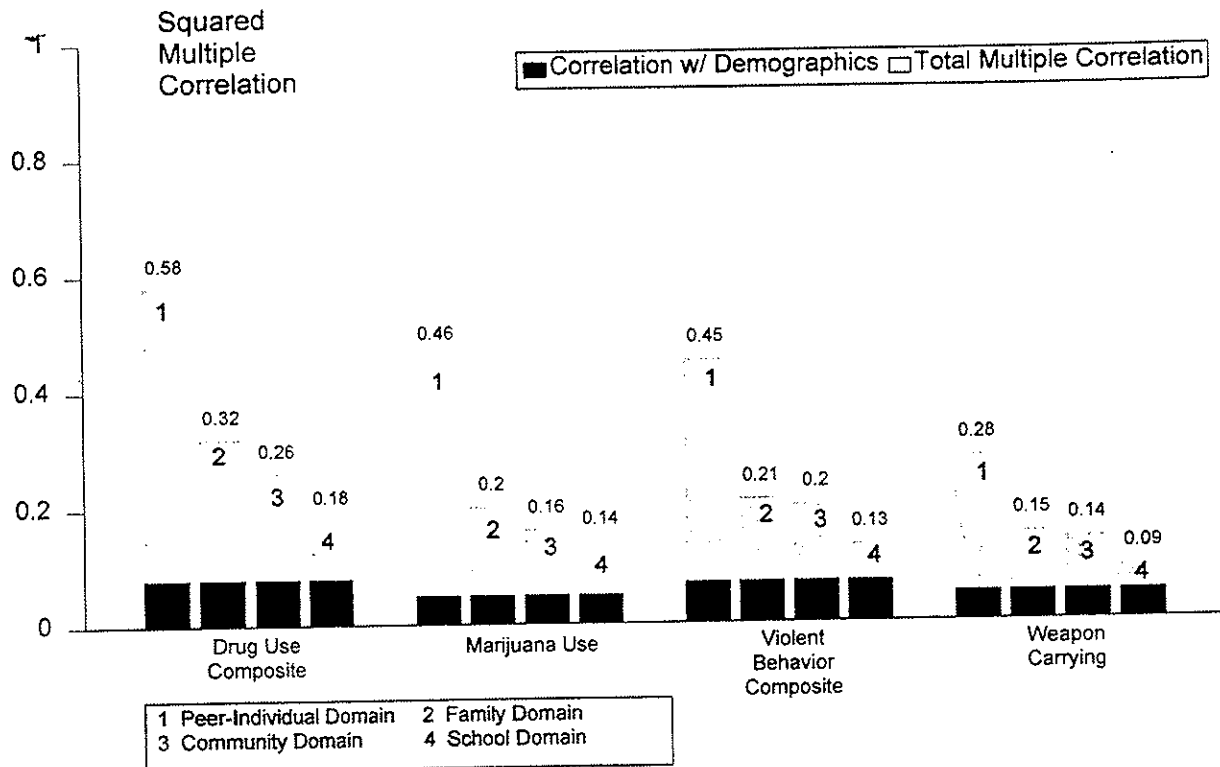


Figure 3-5b Squared Multiple Correlations of Drug Use and Violent Behavior With Risk and Protective Factors by Domain



A supplementary multiple linear regression analysis was conducted to determine how much additional predictability in health risk behaviors would be afforded by including risk and protective influences from all domains (rather than within each domain separately, as presented throughout this chapter). The results were dramatic in that the increases in predictability of each of the eight health risk behaviors over that due to peer-individual risk and protective factors alone were virtually nonexistent. That is, although the predictability of these behaviors in the other domains was significant in and of themselves, they added virtually nothing to what was determined through peer-individual factors alone.

The specific influences of demographic factors across health risk behaviors and domains is also interesting. Grade level is seen as the strongest demographic correlate with most health risk behaviors in most instances. ATOD use indicators evidence their well-documented risk with advancing grade level. Violent behavior indicators, however, show a markedly different pattern, peaking at eighth grade and declining through high school. Gender differences are consistently seen in the use of smokeless tobacco and violent behaviors—males more likely to engage in them than females. Racial/ethnic differences (represented here as simply white students distinguished from nonwhite) are evidenced only in violent behavior, and these indicate that minority students are more likely to engage in these behaviors than are white students. Interestingly, however, minority status is not a significant influence on violent behavior in the peer-individual domain. This indicates that white/nonwhite differences in these behaviors can be accounted for by differences in peer-individual risk factors such as alienation, attitudes toward antisocial behavior, etc. Family, community, and school influences do not account for these differences between white and nonwhite students, however.

Domain by domain, specific risk factors consistently emerged as highly predictive of all health risk behaviors:

In the peer-individual domain, the tendency to engage in all forms of antisocial behavior (using drugs, being suspended from school, carrying weapons) was repeatedly seen as a potent correlate with most health risk behaviors. Similarly, favorable attitudes toward drug use and early initiation of problem behaviors were also consistently seen as strong peer-individual influences on these behaviors.

In the family domain, a history of antisocial behavior on the part of parents or siblings was a strong influence on students engaging in health risk behaviors themselves. The perceived attitudes of parents—favorable toward antisocial behavior—was also a consistent influence on students' behavior.

themselves. The perceived attitudes of parents—favorable toward antisocial behavior—was also a consistent influence on students' behavior.

In the community domain, perceived availability of guns and drugs and permissive community laws and norms were the most potent influences on health risk behaviors.

In the school domain, a history of academic failure and a low commitment to school were pervasive influences on the health risk behaviors.

With some exceptions, the protective influences were less predictive of these behaviors than were the risk factors described above. This has been in evidence in other research conducted by the University of Washington's Social Development Research Group (e.g. Pollard, 1994) and merits further discussion. The interplay of risk and protective factors is probed more fully in the next chapter of this report.



## Chapter 4: Combinations of Risk and Protective Factors and Their Relationships to Alcohol, Tobacco and Other Drug Use and Violence

The previous chapter explored the full predictive power provided of risk and protective factors in determining engagement in selected health risk behaviors (tobacco use, alcohol use, illicit drug use, and engaging in violent behavior). It also identified those risk and protective factors that had the strongest associations with these behaviors.

In this chapter, the authors will again look at the interplay of risk and protective factors and their association with health risk behavior. However, this chapter will classify students at varying levels of risk and protection to determine the extent to which these levels are related to behavior (regardless of the specific risk or protective factors in place). While analyses in the *Analytic Report* (Gabriel, et al., 1995) clearly showed that the more risk factors a student possessed, the more likely he or she was to engage in these behaviors (and the more protective factors were in evidence, the less likely), there was no effort to look at combinations of risk and protection in individuals or groups of students. That is, do moderate or high levels of protection ameliorate the influence of high risk in the likelihood of engaging in these health risk behaviors? And, perhaps more fundamentally, what is the likelihood that a student with a large number of risk factors also possesses a moderate or high number of protective factors? To address the interaction of risk and protection as they relate to health risk behaviors, their co-occurrence must be analyzed in a manner not yet presented in this report.

## Levels of Risk and Protection

To conduct this analysis, the frequency distributions of the number of risk and protective factors present in each student were analyzed to select reasonable cutoff levels for high, medium, and low categories. These distributions are shown in Table 4-1 across Grades 8, 10, and 12 using only those survey forms that included all risk and protective factors. No surveys from sixth grade were used since the forms used at that grade level did not include all risk factors.

Table 4-1

**Distributions of the Number of Risk and Protective Factors**

Risk Factors <sup>1</sup>		Protective Factors <sup>2</sup>	
Number of Factors	Percent of Students	Number of Factors	Percent of Students
0	6.7	0	0.8
1	7.6	1	6.2
2	7.5	2	8.5
3	9.6	3	12.4
4	9.3	4	15.4
5	8.8	5	16.4
6	8.9	6	18.8
7	8.3	7	12.3
8	8.8	8	9.2
9	6.3		
10	4.0		
11	3.1		
12	4.1		
13 or more	7.1		

<sup>1</sup> Based on the distribution of 20 risk factors among 1,895 students in Grades 8, 10, and 12.

<sup>2</sup> Based on the distribution of eight protective factors among 2,095 students in Grades 8, 10, and 12.



A grouping was sought that would yield nearly equal proportions in each group with no more than four groups. Potential groupings were then related to use to assure a set of three or four levels that maintained the relationships between risk or protection and the health behaviors discussed in Chapter 3. These groupings were also used in the local reports of school-level survey results provided to all participating schools and districts. It was determined to classify risk across four levels and protection across three levels as follows:

- |                             |   |
|-----------------------------|---|
| <i>Low Risk</i>             | - Students with 0, 1, or 2 risk factors (21.8% of sample)       |
| <i>Moderately Low Risk</i>  | - Students with 3, 4, or 5 risk factors (27.7%)                 |
| <i>Moderately High Risk</i> | - Students with 6, 7, or 8 risk factors (26%)                   |
| <i>High Risk</i>            | - Students with 9 or more risk factors (24.5%)                  |
| <br>                        |   |
| <i>Low Protection</i>       | - Students with 3 or fewer protective factors (27.9% of sample) |
| <i>Moderate Protection</i>  | - Students with 4 or 5 protective factors (31.8%)               |
| <i>High Protection</i>      | - Students with 6 or more protective factors (40.3%)            |

While this classification scheme yields relatively equal group sizes across grades, it is expected that there will be differences by grade in the percentage of students in each category. As noted earlier in this report, many risk factors are more likely to be in evidence as students get older, and some protective factors are less likely as students get older. The grade-to-grade differences in the number and percentage of students at these levels of risk and protection are shown in Table 4-2. Perhaps the most striking difference is in the “low-risk” category. Among eighth graders, over 30 percent of students fall in this category. Among high school seniors, just under 12 percent are classified as low risk. The compensating category appears to be in the “moderately high risk” group, in which only 20 percent of eighth graders, but nearly 36 percent of sixth graders, are classified.

In the subsequent analysis of health risk behaviors, student grade level is taken into account so as not to confound the interpretation of results. That is, grade to grade differences will be accounted for first so that the resultant association between risk and protective factors and health risk behaviors is not simply repeating the relationship between grade level and these risk and protective factors and behaviors.

Table 4-2  
**Levels of Risk and Protection  
 Number (Percent) of Students by Grade Level**

	Grade 8	Grade 10	Grade 12
<b>Level of Risk</b>			
Low	246 (30.7)	109 (17.0)	53 (11.8)
Mod. Low	228 (28.4)	173 (26.9)	117 (26.0)
Mod. High	161 (20.0)	178 (27.8)	160 (35.6)
High	167 (20.9)	182 (28.3)	120 (26.6)
<b>TOTAL</b>	<b>802 (100)</b>	<b>642 (100)</b>	<b>450 (100)</b>
<b>Level of Protection</b>			
Low	249 (27.4)	239 (34.1)	107 (22.0)
Moderate	266 (29.3)	200 (28.6)	194 (39.8)
High	393 (43.3)	261 (37.3)	186 (38.2)
<b>TOTAL</b>	<b>908 (100)</b>	<b>700 (100)</b>	<b>487 (100)</b>

Frequencies of the levels of risk and protection are useful in assessing the relationships with health risk behaviors. However, simple frequencies do not represent the co-occurrence of risk and protection in individuals or the relative distribution of protection levels given a constant level of risk. The combinations of levels of risk and protection among these students are shown in Table 4-3.

Table 4-3

**Number (percent) of Students at All  
Combinations of Levels of Risk and Protection**

		Levels of Protection			Total
		Low	Medium	High	
Levels of Risk	Low	14 (<1%)	75 (4%)	302 (17%)	391 (22%)
	Mod. Low	71 (4%)	189 (11%)	239 (13%)	499 (28%)
	Mod. High	153 (8%)	179 (10%)	137 (7%)	469 (25%)
	High	265 (15%)	130 (7%)	47 (3%)	442 (25%)
<b>Total</b>		503 (28%)	573 (32%)	725 (40%)	1,801

The expected relationship between risk and protection is in evidence; i.e., students who are at high risk are typically at low protection, but it is obviously not a perfect relationship. In other words, for students at a given level of risk there is still some variation in levels of protection. In fact, the 469 students classified as at “moderately high risk” are almost evenly spread across the three levels of protection: 153 are at low protection (33 percent of these students), 179 are at moderate protection (38 percent), and 137 are at high protection (29 percent).

Previous analysis of these data (Gabriel, et al., 1995) has shown that as levels of risk increase, so does the likelihood of engaging in health risk behaviors. Conversely, as protection increases, the likelihood of engaging in health risk behaviors decreases. The question to be addressed by the analysis presented in the remainder of this chapter is how various combinations of levels of risk and protection, as displayed in Table 4-3, influence health risk behaviors. In the example cited above, is there any difference in health risk behaviors among the 469 moderately high-risk students depending upon the level of protection they have? Is this influence just as the protective factor theory alone would predict (i.e., regardless of the level of risk)—decreasing prevalence of health risk behavior with increased protection—or is there something unique about specific combinations of risk and protection? The remaining sections of this chapter will address this question with respect to the eight health risk behaviors studied throughout this report.

## **The Influence of Levels of Risk and Protection on Health Risk Behaviors**

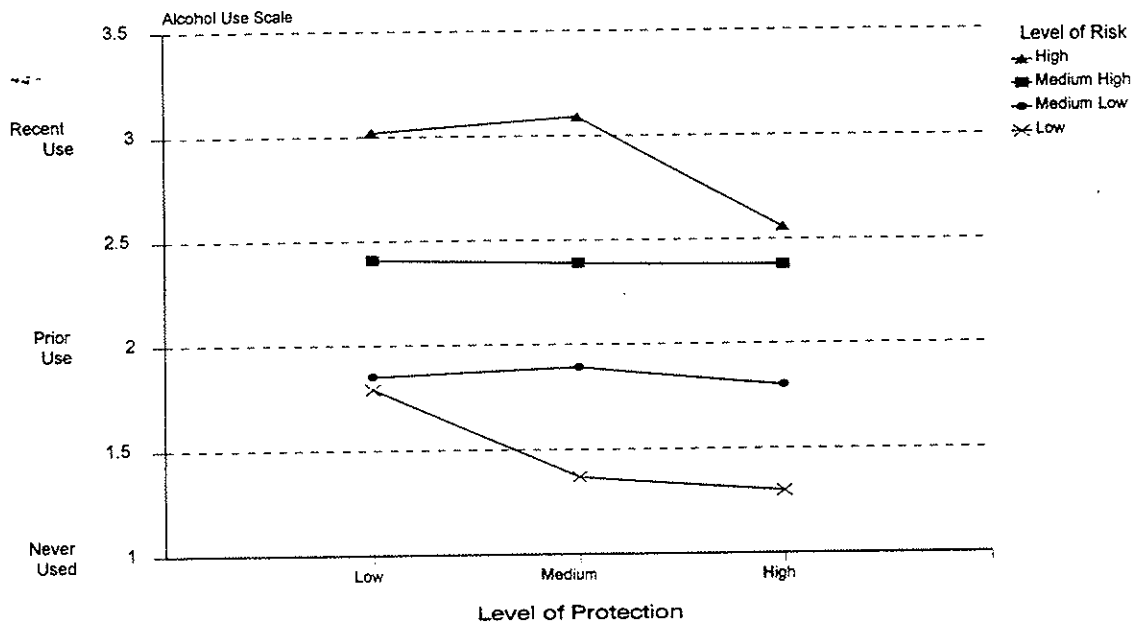
To examine the combined influence of risk and protection on health risk behaviors, a two-factor analysis of variance (ANOVA) framework was employed. The two-factor design is identical to that shown in Table 4-3: level of risk is one factor and level of protection is the other. The ANOVA tests three effects in this design:

- ◆ The “risk” main effect—assesses the extent to which the occurrence of the given health risk behavior is different for the four different levels of risk.
- ◆ The “protection” main effect—assesses the extent to which the occurrence of the given health risk behavior is different for the three different levels of protection.
- ◆ The “risk by protection” interaction—assesses the extent to which the occurrence of the given health risk behavior is different for the particular combination of risk and protection over and above what either would indicate by itself.

Earlier chapters investigated the relationship between background characteristics, risk and protective factors, and health risk behaviors. These results indicated that student grade level, for instance, is strongly related to both level of risk and current alcohol and other drug use. Consequently, to assure that any perceived relationship between levels of risk and protection and health risk behaviors is real and not a consequence of other student characteristics, three characteristics of the students were employed as covariates before considering the influence of risk and protection on health risk behaviors. As in the regression analyses presented earlier, these factors were student gender, minority status, and grade level.

For each specific health risk behavior, the general pattern of risk and protection as related to health risk behaviors will be presented graphically. Then each relationship will be tested with an analysis of covariance (ANCOVA) in the two-factor design described below.

**Figure 4-1 Alcohol Use Among Students  
With Varying Levels of Risk and Protection**



## Alcohol Use

One clear way to examine the interplay of risk factors and protective factors on the use of substances or on violent behavior is to calculate use as a function of risk for the levels of protection. Figures 4-1 and 4-2 display this interrelationship for alcohol use and binge drinking. These and all other graphs presented in this chapter do not attempt to accommodate the impact of variables such as age or gender on risk, protection, or health behaviors.

Alcohol use is measured by the alcohol use scale described in the *Technical Report* (Deck, et al., 1995). This is a four-point scale ranging from 1 (never used) to 4 (frequent use). Binge drinking is measured with item 50 of the survey and is scaled from 1 to 5: no binges in previous two weeks, up to six or more.

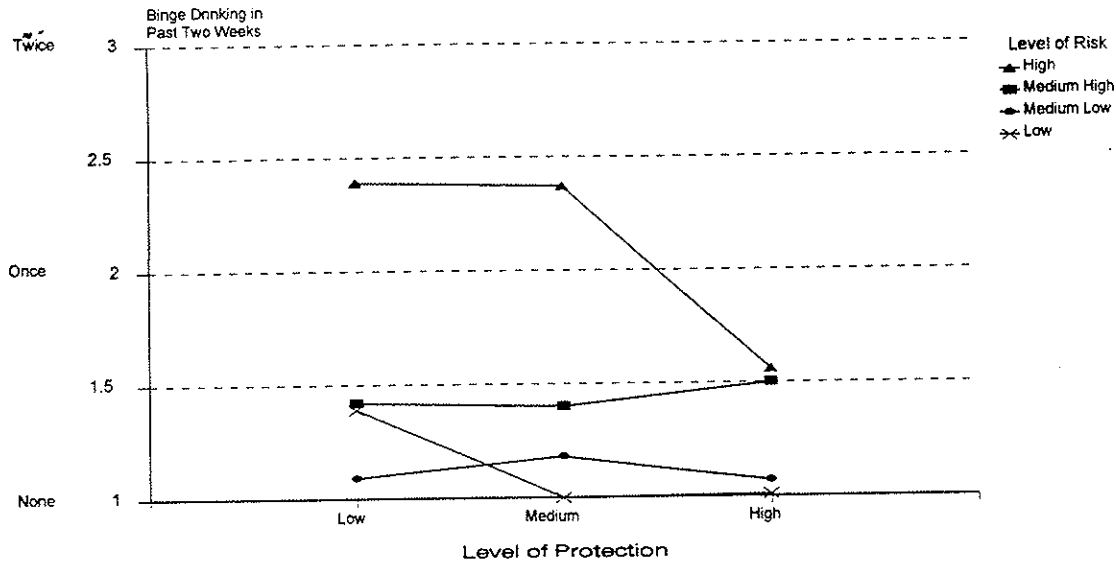
Figure 4-1 displays the direct relationship between risk and use and, less obviously, the relationship between protection and use. This figure shows noticeable increases in use for each

level of risk. The line of use for students of low risk is at the lowest level of alcohol use. Conversely, the line representing students at high risk is well above the other lines at an average level of about 3, indicating that most students at high risk reported some alcohol use in the previous 30 days. The general slope of the lines from the upper left to the lower right suggests that higher levels of protection are related to less use.

More important than the general relationship between risk and use and between protection and use is the interaction of risk and protection. Figure 4-1 is helpful in seeing that interaction. A given "level of risk" line that is flat across all levels of protection suggests that alcohol use is about the same at this level of risk, no matter what protective influences are present. This figure shows no difference in alcohol use at all levels of protection among students at medium low or medium high risk. No matter their level of protection, they score an average of about 2.0 to 2.5 on the alcohol use scale. Students at low risk show slightly less alcohol use when they have medium or high levels of protection. Likewise, those students at the highest level of risk appear to use less alcohol when they have a high level of protection.

While examining these figures, the relative sizes of these groups of students (see Table 4-3) should be kept in mind. Only 14 students had both low risk and low protection. Forty-seven fell in the high risk, high protection cell—a lot more than 14, yet still a fairly small number. The points on the graph that represent these two groups could be out of line with other points from the same risk level due simply to statistical variation associated with such small groups. To assess whether the slopes seen in the graphs represent real differences that could be expected in the population or if they are just chance variation due to small sample size, the ANCOVA analyses presented later must be used.

**Figure 4-2 Binge Drinking Among Students With Varying Levels of Risk and Protection**



The pattern associated with binge drinking, Figure 4-2, is less clear than that of the overall alcohol use scale. This is probably due to the nature of the question. Only binge drinking occurring within two weeks of the survey was addressed. Students who binge drink about once a month may be just as likely to report no binges in the previous two weeks as they were to report one binge. Less frequent bingeing was more likely to be missed and counted with those who have never binged. This “floor effect” can be seen in Figure 4-2 where the average students with low or medium low risk respond with “1,” no binges. Even so, higher risk clearly is related to a greater likelihood to binge and/or a greater frequency of bingeing. Protection does not seem to reduce the likelihood to binge, except at the highest level of risk.

The results of the two-factor ANCOVA are given in Table 4-4. The dependent variables are the composite scale of alcohol use and the amount of binge drinking from item 50 of the survey displayed in Figures 4-1 and 4-2. Students in Grade 6 were excluded, as in all analyses in this chapter.

Grade level was the only covariate evidencing significant differences on alcohol use. Even when grade level was taken into account, the difference in use among the various levels of both risk and protection continued to be significant. In other words, regardless of student grade level, higher risk still meant higher alcohol use. Likewise, greater protection was related to lower use. Moreover, the last line of the table shows that the interaction between risk and protection is statistically significant. In the case of alcohol use, increasing protection results in lower use when a student is at very low or very high risk.

The ANCOVA results also confirm the pattern of binge drinking displayed in Figure 4-2. Even though boys are more likely to binge (and have higher levels of risk), increased risk is still associated with increased binge drinking regardless of gender. While the level of protection is not a significant main effect, its interaction with level of risk is. This was shown earlier in Figure 4-2 where, among high-risk students, high levels of protection were associated with dramatically lower prevalence of binge drinking.

Table 4-4  
ANCOVA Results for Alcohol Use

	Alcohol Use Scale		Binge Drinking	
	F	p	F	p
<b>Covariates</b>				
Gender	0.34	.56	<b>7.39</b>	<b>.01</b>
Minority Status	5.35	.02	4.74	.03
Grade Level	<b>73.96</b>	<b>&lt;.01</b>	4.19	.04
Level of Risk Main Effect	<b>201.39</b>	<b>&lt;.01</b>	<b>102.30</b>	<b>&lt;.01</b>
Level of Protection Main Effect	<b>5.07</b>	<b>.01</b>	2.68	.07
Risk by Protection Interaction	<b>2.70</b>	<b>.01</b>	<b>4.99</b>	<b>&lt;.01</b>

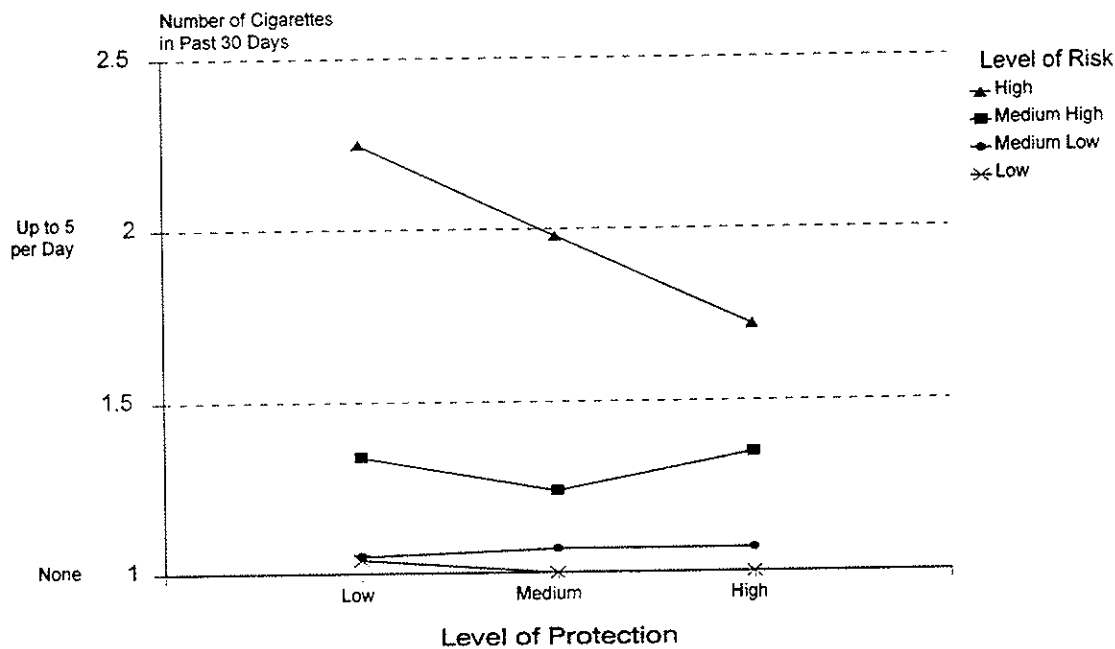
Bold entries indicate statistically significant (p<.01) effects.



## Tobacco Use

Cigarette and smokeless tobacco use over the previous 30 days is displayed in relation to levels of risk and protection in Figures 4-3 and 4-4. Both measures of tobacco use come from single items in the WSSAHB. Smoking is asked in item 42, where a "1" indicated no smoking, a "2" meant up to five cigarettes a day, to a "5" which indicated smoking more than a pack a day. The next question asked about smokeless tobacco. Here again, a "1" meant no use. Those who used smokeless tobacco once or twice marked "2" and a "5" meant they used it ten or more times in the 30-day period.

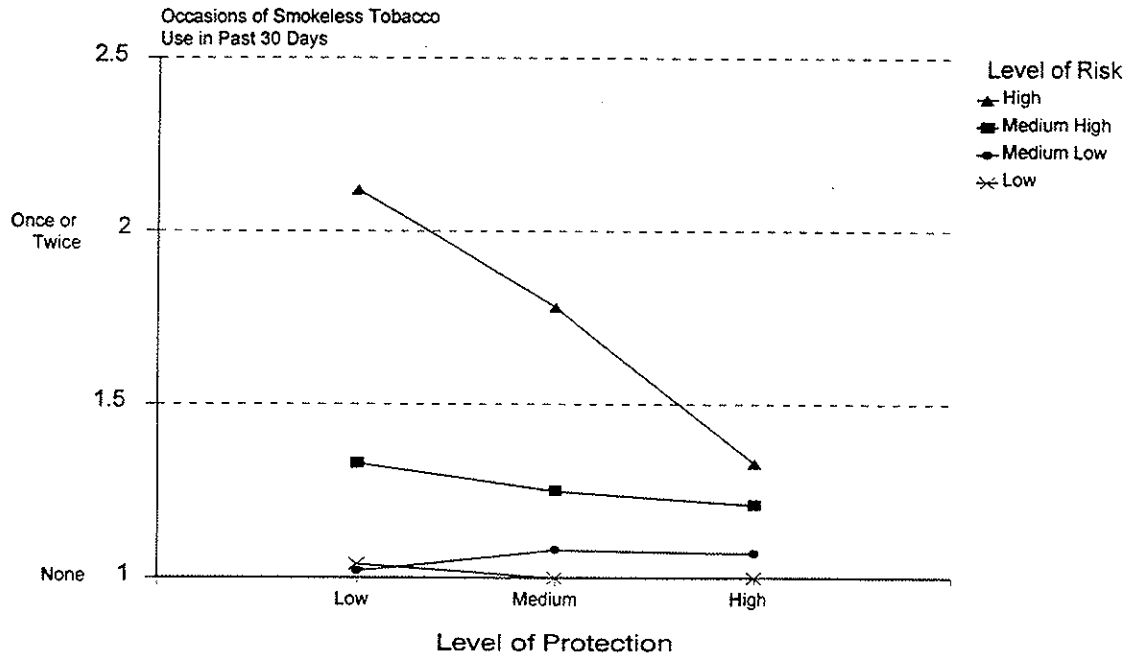
**Figure 4-3 Cigarette Smoking Among Students With Varying Levels of Risk and Protection**



Both graphs show a strong relationship between level of risk and use. In fact, almost all tobacco use is among students at high risk. Mitigating this pattern is the level of protection among students at high risk. As levels of protection increase for these students, there are progressively lower prevalence rates of tobacco use. Increased protection appears so effective in reducing

smokeless tobacco use that the average use among students of high risk and high protection is equal to that of students at medium high risk and low protection. In other words, high levels of protection have the effect of reducing students at high risk to a lower level of risk in terms of their likelihood of using smokeless tobacco.

**Figure 4-4 Smokeless Tobacco Use Among Students With Varying Levels of Risk and Protection**



The ANCOVA results shown in Table 4-5 confirm these interpretations. Not only are the independent effects of risk and protection statistically significant, but their interaction is as well. These significant results were found after adjusting for the strong relationship between tobacco use and the three background variables. As in most forms of substance use, grade level is highly associated with both forms of tobacco use—the older students get the more likely they are to use. In addition, smokeless tobacco use evidences one of the strongest gender differences among all of these health risk behaviors. Among high school students in Washington, males are three to four times as likely to be current users of smokeless tobacco than are females. Lastly, minority students are less likely to smoke cigarettes than are white students.

As was the case with alcohol and binge drinking and shown in Figures 4-3 and 4-4, high levels of protection appear to have their greatest influence in reducing tobacco use behaviors among students at highest risk.

Table 4-5

**ANCOVA Results for Tobacco Use**

	30-Day Cigarette Use		30-Day Smokeless Tobacco Use	
	F	p	F	p
<b>Covariates</b>				
Gender	2.83	.09	<b>52.02</b>	<b>&lt;.01</b>
Minority Status	6.03	.01	0.58	0.45
Grade Level	9.60	<b>&lt;.01</b>	7.30	.01
Level of Risk Main Effect	<b>118.38</b>	<b>&lt;.01</b>	<b>51.86</b>	<b>&lt;.01</b>
Level of Protection Main Effect	4.65	.01	7.78	<b>&lt;.01</b>
Risk by Protection Interaction	2.83	.01	3.77	<b>&lt;.01</b>

Bold entries indicate statistically significant (p<.01) effects.

**Illicit Drug Use**

Illicit drug use is represented by the composite drug use scale and, more specifically, by whether each student had reported any recent marijuana use (within 30 days). The drug use scale is described in the WSSAHB *Technical Report* (Deck, et al., 1995). It has four points, like the alcohol use scale, ranging from "never used" to "frequent use." Marijuana use in the previous 30 days was assessed by a single item using a five-point scale of the survey. A "1" indicated no use; "2" represented one or two times; "5" indicated students using marijuana at least ten times in the 30-day period.

Figure 4-5 displays how illicit drug use is related to varying levels of risk and protection.

Figure 4-6 displays the data for 30-day marijuana use.

Both figures show dramatically increasing levels of use among students at higher levels of risk. All but the students at the highest risk level reported very little marijuana use. For both measures

of drug use, greater protection in general does not appear to be related to lower use. The exception, again, is with those students at highest risk. For the high-risk group, the highest level of protection is associated with dramatic reductions in illicit drug use, in general, and current marijuana use, in particular.

**Figure 4-5 Illicit Drug Use Among Students With Varying Levels of Risk and Protection**

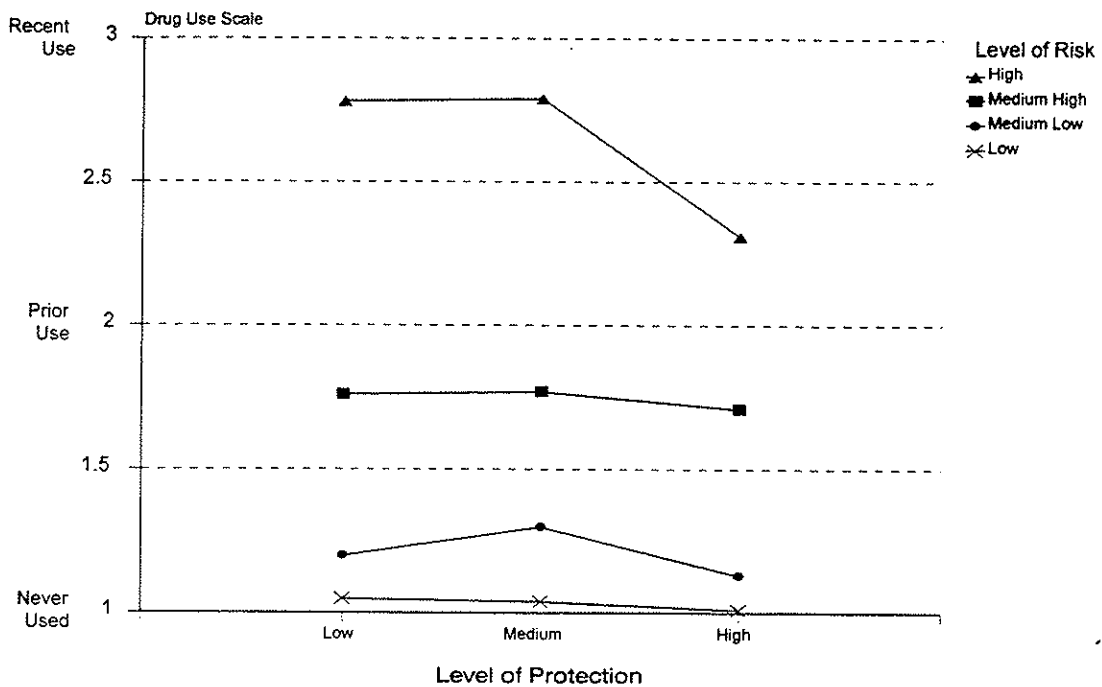


Table 4-6 shows the results of the ANCOVA test of significance for the data represented in Figures 4-5 and 4-6. Unlike the substances previously examined, very strong differences were seen for each of the three background variables. Students of different gender, minority status, and grade level all exhibit large differences in use. These differences indicate that students who are white, male, and older tend to evidence higher levels of illicit drug use than do minority, female, or younger students.

When these differences were accounted for in the analysis of covariance, risk remained closely related to use and protection showed a strong relationship to the overall illicit drug use scale, but not to 30-day marijuana use. The interactions were not significant. After accounting for differences due to race, gender and grade, there is no differential effect of increased protection at varying levels of risk.

**Figure 4-6 Marijuana Use Among Students With Varying Levels of Risk and Protection**

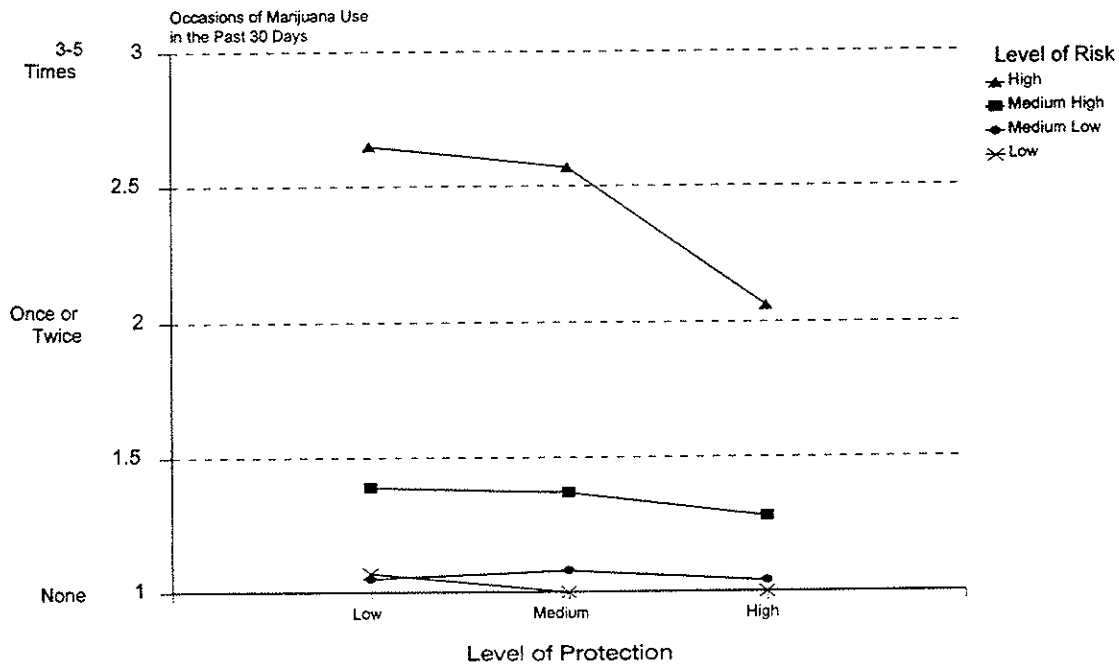


Table 4-6  
ANCOVA Results for Illicit Drug Use

	Drug Use Scale		30-Day Marijuana Use	
	F	p	F	p
<b>Covariates</b>				
Gender	<b>11.51</b>	<b>&lt;.01</b>	<b>9.66</b>	<b>&lt;.01</b>
Minority Status	<b>11.99</b>	<b>&lt;.01</b>	<b>7.59</b>	<b>0.01</b>
Grade Level	<b>28.36</b>	<b>&lt;.01</b>	<b>10.31</b>	<b>&lt;.01</b>
Level of Risk Main Effect	<b>280.45</b>	<b>&lt;.01</b>	<b>161.36</b>	<b>&lt;.01</b>
Level of Protection Main Effect	<b>4.94</b>	<b>0.01</b>	<b>2.83</b>	<b>0.06</b>
Risk by Protection Interaction	<b>1.85</b>	<b>0.09</b>	<b>1.72</b>	<b>0.11</b>

Bold entries indicate statistically significant ( $p < .01$ ) effects.

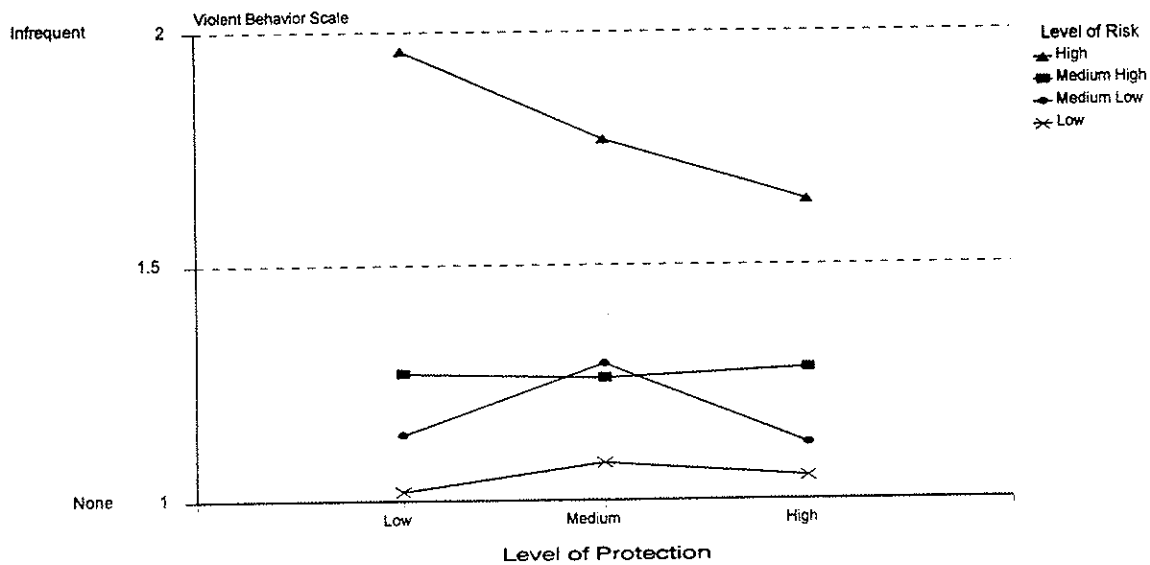
### Violent Behavior

The violent behavior scale was composed of four items from the survey as described in the *Technical Report* (Deck, et al., 1995) and, unlike the other composite scales, was set to three levels. On this scale a “1” indicates no violent behavior in the previous year, “2” indicates infrequent violence as represented by engaging in one or two of the behaviors in the previous year, and “3” identifies students who reported three or more different behaviors or one behavior repeated ten or more times. Figure 4-7 displays the interrelationship of risk and protection on the extent of violent behavior.

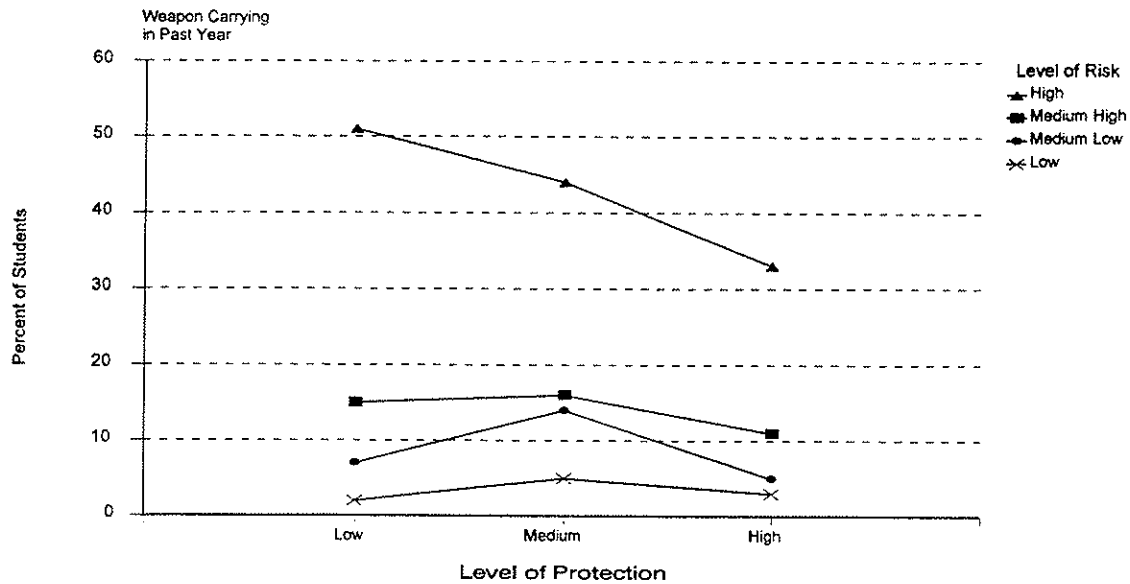
A second, more specific, measure of violence was also analyzed. Weapon carrying, as shown in Figure 4-8, was measured by students’ responses to a series of items on the WSSAHB. Any student who indicated carrying any weapon in the previous year was given a “1” on this dichotomous variable. The values displayed in Figure 4-8 are the percentage of students in each group who carried any weapon anytime, anywhere in the 12 months before the survey.

Just as with several of the substance use behaviors, both measures of violent behavior show greatest activity among students at highest risk. Protective factors, as measured in the WSSAHB, appear to have little general relationship to violent behavior, except at the highest level of risk.

**Figure 4-7 Violent Behavior Among Students With Varying Levels of Risk and Protection**



**Figure 4-8 Weapon Carrying Among Students With Varying Levels of Risk and Protection**



The background variables assessed on the first step of the ANCOVA analysis are each again highly significant. There are extremely large gender differences on the violence scale and the specific measure of carrying a weapon. Males are far more likely than females to engage in these violent behaviors. The difference between whites and minorities is also fairly large. Unlike previous measures of ATOD use, minorities evidence higher levels of violent behavior than do white students. Grade level also contributes significantly to the prediction of violence, although not as dramatically as seen in other health risk behaviors. As shown earlier in this report (see Table 3-5), older students are less likely to engage in the violent behaviors measured by the WSSAHB. Bear in mind that the results shown in Table 4-7 are slightly different from those shown earlier in the analysis described in Table 3-5, since sixth graders are included in Table 3-5 but not in Table 4-7.



Table 4-7

**ANCOVA Results for Violent Behavior**

	Violent Behavior Scale		Weapon Carrying	
	F	p	F	p
<b>Covariates</b>				
Gender	<b>112.03</b>	<b>&lt;.01</b>	<b>76.70</b>	<b>&lt;.01</b>
Minority Status	<b>21.88</b>	<b>&lt;.01</b>	<b>30.53</b>	<b>&lt;.01</b>
Grade Level	<b>6.89</b>	<b>&lt;.01</b>	<b>7.38</b>	<b>&lt;.01</b>
Level of Risk Main Effect	<b>130.47</b>	<b>&lt;.01</b>	<b>84.65</b>	<b>&lt;.01</b>
Level of Protection Main Effect	1.96	.14	3.12	.04
Risk by Protection Interaction	3.07	<b>.01</b>	1.60	.14

Bold entries indicate statistically significant ( $p < .01$ ) effects.

Once the relationship between violence and the background variables is included, level of protection does not have a significant consistent relationship to violence. Higher levels of risk are still strongly related to greater violence. However, even after adjusting for the strong relationship to the background variables, the pattern of Figure 4-7 is supported with a significant interaction effect between risk and protection on the violent behavior scale. As has been seen repeatedly in the other health risk behaviors, increased protection is associated with significant reductions in violent behavior among the highest risk students.

### Summary and Conclusion

In general, the analysis of varying levels of risk and protection and their combination has contributed increased understanding of their influences on ATOD use and violence. Prior research (e.g., Hawkins, Catalano and Miller, 1992; Werner and Smith, 1992) has shown that, as the level of risk increases and as the level of protection decreases, health risk behaviors increase. These have been reinforced in the analyses presented here, even after accounting for individual

differences in students' minority status, gender, and grade level. Furthermore, the differences in health risk behaviors due to varying levels of risk are usually far greater than those due to varying levels of protection. The added value to the analysis presented here, however, is in examining the influence of varying combinations of risk and protective levels in the same students. For a number of these behaviors, increasing the level of protection for students at highest risk was associated with significant declines in the occurrence of that behavior. In fact, the influence of protective factors was typically greatest among students at highest risk.

Though there was no added protection against weapon carrying, general violent behavior was lower among high-risk students with a high level of protection. Alcohol use and binge drinking were also less prevalent among students at the highest level of risk when they had more protective factors.

The greatest ameliorating influence of protective factors in combination with high numbers of risk factors occurred with tobacco use. Both cigarette use and the use of smokeless tobacco were dramatically lower among high-risk students when those students had many protective factors present. Since tobacco is often the substance first used by adolescents, preventing its use by students who would otherwise be at high risk is important. In contrasting the influences of tobacco and alcohol as the initial "gateway" substance used by preadolescents, Graham, et al. (1991) found that young people initiating with tobacco were more likely to experience later problems with substance use than were young people who began their experimentation with alcohol. The protective factors of providing opportunities for positive involvement and fostering rewards for conventional involvement in school, community, family and peers, as well as developing social skills, present a possible avenue of prevention activity.

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