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# The Effect of School Suspensions and Arrests on Subsequent Adolescent Antisocial Behavior in Australia and the United States

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**Abstract**

**Purpose:** To examine the effect of school suspensions and arrests (i.e., being taken into police custody) on subsequent adolescent antisocial behavior such as violence and crime, after controlling for established risk and protective factors in Victoria, Australia and Washington State, United States (U.S.).

**Methods:** This article reports on analyses of two points of data collected 1 year apart within a cross-national longitudinal study of the development of antisocial behavior, substance use, and related behaviors in approximately 4000 students aged 12 to 16 years in Victoria, Australia and Washington State, U.S. Students completed a modified version of the *Communities That Care* self-report survey of behavior, as well as risk and protective factors across five domains (individual, family, peer, school, and community). Multivariate logistic regression analyses investigate the effect of school suspensions and arrests on subsequent antisocial behavior, holding constant individual, family, peer, school, and community level influences such as being female, student belief in the moral order, emotional control, and attachment to mother.

**Results:** At the first assessment, school suspensions and arrests were more commonly reported in Washington, and school suspensions significantly increased the likelihood of antisocial behavior 12 months later, after holding constant established risk and protective factors (adjusted odds ratio [OR] 1.5, 95% confidence interval [CI] 1.1–2.1, $p < .05$). Predictors of antisocial behavior spanned risk and protective factors across five individual and ecological areas of risk. Risk factors in this study were pre-existing antisocial behavior (OR 3.6, CI 2.7–4.7, $p < .001$), association with antisocial peers (OR 1.8, CI 1.4–2.4, $p < .001$), academic failure (OR 1.3, CI 1.1–1.5, $p < .01$), and perceived availability of drugs in the community (OR 1.3, CI 1.1–1.5, $p < .001$). Protective factors included being female (OR 0.7, CI 0.5–0.9, $p < .01$), student belief in the moral order (OR 0.8, CI 0.6–1.0, $p < .05$), student emotional control (OR 0.7, CI 0.6–0.8, $p < .001$), and attachment to mother (OR 0.8, CI 0.7–1.0, $p < .05$).

**Conclusions:** School suspensions may increase the likelihood of future antisocial behavior. Further research is required to both replicate this finding and establish the mechanisms by which school suspensions exert their effects. 

*Keywords:* Adolescence; Antisocial behavior; Risk factors; Protective factors; Sanctions; Predictors; Youth

Adolescent antisocial behavior, defined as any behavior that violates societal rules and conventions or personal rights [1], includes behaviors such as violence, stealing, and truancy from school. Antisocial behavior is prevalent in Western societies such as Australia and the United States (U.S.), ranging from 5% to 17% depending on the criteria used [2,3]. Further, antisocial behavior rises in prevalence through adolescence, with peak incidence in mid-to-late

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adolescence [4–6]. Such behavior is costly to the community, affecting individuals through physical damage to people and property, as well as society at large through increased costs of interventions and the criminal justice system [7]. Antisocial behavior is clearly a major public health and social problem [8–10].

An understanding of how antisocial behavior develops is crucial to inform prevention programs and policy development. A range of individual, peer, family, school and community influences on the development of antisocial behavior have been studied. School suspensions (mandatory leave from school for a set period) and arrests (being taken into custody by police) are also important potential influences on subsequent behavior [11]. To the authors' knowledge, there are no other studies to date that have explored the effects of school suspensions and arrests on subsequent antisocial behavior, after controlling for a comprehensive range of known individual, peer, family, school and community risk and protective factors. The current study addresses this research question in samples drawn from two states in countries with different policies around antisocial behavior (Australia and the U.S.) but states that are similar demographically; the state of Victoria, Australia and Washington State, U.S.

## Literature Review

Rates of antisocial and violent behaviors appear similar in Washington State and Victoria [12–15]. To reduce such behavior, globally, crime and mental health prevention programs are adopting a "developmental pathways" approach [16–19]. This approach recognizes that effective intervention can occur at critical developmental phases and life transition points. Interventions aim to reduce risk factors and increase protective factors [19]. *Risk factors* are prospective predictors that independently increase the likelihood that an individual or group will engage in adverse outcomes [19,20]. *Protective factors* both directly decrease the likelihood of antisocial behavior [21,22] and mediate or moderate the influence of risk factors [23,24]. Risk and protective factors are organized according to their influence in different contexts, including communities (e.g., legal and normative expectations for behavior, indicators of neighborhood disorganization), families (e.g., family history of antisocial behavior, unclear family rules, low monitoring of adolescent's behavior), schools (e.g., low interest in subjects, academic failure), peer groups (e.g., association with antisocial peers), and within individuals (e.g., lack of impulse control) [20]. Protective factors at the family, school, and community levels include opportunities to engage in prosocial activities (e.g., sport, community groups, input into school activities and rules), recognition for prosocial involvement, as well as attachment, and healthy beliefs and clear standards [25].

The factors that influence the development of antisocial behavior have been widely studied [8,15]. However, in general, studies have not tapped all five levels of influence and concurrently measured risk and protective factors [26]. The current study addresses the knowledge gap by including comprehensive measures of known risk and protective factors at all five levels of influence.

Consistent with country level differences, Washington State and Victoria differ in their policies addressing problem behavior (i.e., antisocial behavior, substance use). For example, in Victorian schools the emphasis is on ensuring that disciplinary actions do not negatively affect students' studies, and *suspension* from school is not usually implemented unless other disciplinary measures have been unsuccessful [27]. The emphasis is on discipline rather than punishment. The code of conduct sets out ways of highlighting and promoting positive student behavior, as well as detailing discipline procedures [27]. In contrast, a zero tolerance approach (e.g., school suspension or expulsion) toward preventing school violence characterizes Washington State (consistent with other areas of the U.S.) [28]. Students report more school suspensions and arrests in Washington relative to Victoria [12]. Societal responses may affect adolescent development in ways that reduce subsequent antisocial behavior (e.g., deter students from participating in further problematic behavior) [28] or increase problematic behavior (e.g., interrupt student connections to school, increase suspended student's contact with deviant peers, increase rebelliousness) [11,28]. Comparative studies of these two states with different approaches to policy are helpful in providing added variation to examine this question.

Data on antisocial behavior are drawn from the International Youth Development Study (IYDS), a standardized, prospective cross-national study. The IYDS investigates the development of adolescent behavior including antisocial behavior, substance use, depression, and sexual activity in state representative samples from Victoria and Washington State among students recruited when they were in Grades 5, 7, and 9 in 2002. The self-report survey used in this study is a modified version of the *Communities That Care* survey. The measure of antisocial behavior used here does not include substance use outside of school. This instrument was chosen for its established reliability and validity in the U.S. [29–31], and its successful adaptation for use in Victoria [5]. Australia and the U.S. were selected due to their differences in policies in relation to antisocial behavior and substance use. These two states were chosen as exemplars of these countries due to their similarities on a range of population demographic and financial characteristics [13]. With a rigorous design and standardized procedures for participant recruitment, survey development and survey administration [13], the study overcomes the methodological limitations of previous cross-national comparisons [32].

In this article, the *key* research question is whether societal responses to antisocial behavior influence subsequent antisocial behavior, holding constant, previous antisocial

behavior and established risk and protective factors at the individual, peer, family, school, and community levels. We also identify which risk and protective factors measured at the first assessment are predictive of antisocial behavior measured 1 year later. We expected societal responses to increase the likelihood of subsequent antisocial behavior over and above recognized risk and protective factors.

## Methods

### *Participants*

A two-stage cluster sampling approach was used for school and student recruitment in 2002. Schools were randomly selected in the first stage and a target classroom within each school was randomly selected in the second stage. Within each state and grade level, public and private schools containing Grades 5, 7, or 9 were randomly selected using a probability proportionate to grade-level size sampling procedure [33]. The principal or contact person at each school was asked to provide a list of classes for the grade level selected to participate (all classes for Grade 5; mandatory English classes for Grades 7 and 9). Each class was then assigned a number. Using the Microsoft Excel random number generator function, a random number was chosen and the class that corresponded with that number was selected to take part in the project. More details about recruitment and participation rates are described in McMorris et al [13].

Across the three age cohorts (Grades 5, 7 and 9), classes in Washington State yielded a total of 3856 eligible students, of whom 2885 (74.8%) consented to and participated in the survey. In Victoria, 3926 students were eligible for consent and survey administration, of whom 2884 (73.5%) consented and participated. Parents provided written consent for their adolescent to participate in the study and adolescents provided assent to complete the survey. Retention rates at 1-year follow-up in 2003 were 99% in both states.

Data for the Grade 7 ($n_{VIC} = 984$; $n_{WA} = 961$) and Grade 9 ($n_{VIC} = 973$; $n_{WA} = 981$) cohorts are reported due to the focus on adolescent antisocial behavior, and the similarity of measures and higher rates of antisocial behavior in these cohorts. In each state, the Grade 7 cohort was comprised almost entirely of 12- and 13-year-olds, and the Grade 9 cohort of 14- and 15-year-olds, and males and females were equally represented.

### *Procedure*

Protocols were approved by the University of Washington Human Subjects Review Committee and the Royal Children's Hospital Ethics in Human Research Committee. Permission to conduct research in schools in Washington State was obtained from the school districts containing sampled schools and then from principals. In Victoria, permission was obtained from the Department of Education and Training for government (public) schools and the Catholic Education Office for some private schools, and then from principals.

Surveys in 2002 and 2003 were administered in February to June in Washington State and in May to November in Victoria by study staff [13]. Surveys were group-administered in classrooms during a 50–60-minute period. Students absent from school were administered surveys later under the supervision of trained school personnel or in a small percentage of cases (less than 3% at the first assesment, less than 4% at 1-year follow-up), over the telephone by study staff. Upon survey completion at both time-points, students in Washington State received $10. Victorian students received small thank-you gifts (a small pocket calculator upon return of their consent forms in 2002 and a stress ball after completing the survey in 2003).

### *Measures*

The self-reported measures of antisocial behavior, societal responses to this behavior, and the risk and protective factors were drawn from the *Communities that Care* survey [29–31] and include measures widely used in the literature.

*Antisocial behavior.* Antisocial behavior was measured at both time points by asking how often in the past 1 year students had: carried a weapon, stolen something worth more than $5 (U.S.) or $10 (Australia), attacked someone with the idea of seriously hurting them, sold illegal drugs, stole or tried to steal a motor vehicle such as a car or motorcycle, been drunk or high at school, taken a handgun to school, threatened someone with a weapon, and beaten up someone so badly that s/he required medical treatment. Response options ranged from *Never* to *40 or more times* on an eight-point scale. Students were also asked how many whole days during the last four weeks they had missed school because they skipped or wagged (i.e., engaged in truancy), rated from *None* to *11 or more*. Each item was scored as present (students engaged in the behaviors one or more times in the past year) or absent (students never engaged in the behaviors listed) to form a dichotomous measure. A dichotomous measure was appropriate for this study as the distribution of scores showed that few students had engaged in high levels of this behavior [34]; the presence vs. absence of this behavior was therefore the focus here. Loeber and Farrington [34] argued that dichotomization of adolescent antisocial behavior measures yields meaningful results that are interpretable by a wide audience without decreasing the measured strength of associations. To obtain an index of antisocial behavior, a count of each behavior present was summed (possible range of scores 0 to 9). Using this index, students who reported two or more antisocial behaviors were categorically assigned to an "antisocial" group vs. "non-antisocial" group. This criterion

Table 1
Levels of risk and protective factors in Victoria and Washington State at the first assessment

| Variable | Victoria Mean (SD) | Washington Mean (SD) |
|---|---|---|
| Individual risk factors | | |
| Favorable attitudes to antisocial (e.g., think it is acceptable to steal or fight) | 1.6 (.6)* | 1.4 (.5) |
| Favorable attitudes to drugs (e.g., think it is acceptable to use alcohol) | 1.7 (.7)* | 1.5 (.6) |
| Attention/concentration problems (e.g., easily distracted) | 2.5 (.8)* | 2.4 (.8) |
| Impulsivity (e.g., rush into things/act without thinking) | 2.0 (.6)* | 1.9 (.6) |
| Cronbach alpha .53–.90 | | |
| Individual protective factors | | |
| Religiosity (frequency at religious services/activities) | 2.0 (1.0) | 2.7 (1.1)* |
| Belief in the moral order (e.g., it is not even sometimes OK to cheat at school) | 3.1 (.6) | 3.2 (.6) |
| Emotion control (e.g., controls temper when people angry with him/her) | 2.6 (.6) | 2.8 (.7)* |
| Cronbach alpha .56–.90 | | |
| Family risk factors | | |
| Poor family management (e.g., poor monitoring by parents) | 1.8 (.5)* | 1.7 (.5) |
| Family conflict (e.g., family members argue, yell, and use insults) | 2.3 (.8) | 2.3 (.8) |
| Favorable attitude to drugs (e.g., parents condone use of alcohol) | 1.5 (.6)* | 1.3 (.5) |
| Favorable attitude to antisocial (e.g., parents condone stealing) | 1.4 (.5)* | 1.3 (.4) |
| Cronbach alpha .67–.84 | | |
| Family protective factors | | |
| Attachment to mother (e.g., student feels close to mother) | 3.3 (.7) | 3.2 (.7) |
| Attachment to father (e.g., shares thoughts and feelings with father) | 3.0 (.8) | 2.9 (.9) |
| Opportunities for prosocial involvement (e.g., parents ask student for input into family decisions) | 3.1 (.7) | 3.1 (.7) |
| Recognition for prosocial involvement (e.g., parents notice when student is doing a good job and let him/her know about it) | 3.0 (.8) | 3.1 (.8) |
| Cronbach alpha all above .67 | | |
| Peer risk factors | | |
| Association with antisocial peers (e.g., # of best friends who carried a weapon) | 1.2 (.4) | 1.2 (.4) |
| Cronbach alpha .67–.84 | | |
| School risk factors | | |
| School grades (what grades were like in the last year) | 1.7 (.6) | 1.9 (.7)* |
| School protective factors | | |
| Opportunities for prosocial involvement (e.g., students have opportunities to talk to teachers one-on-one) | 2.99 (.45) | 3.04 (.41)* |
| Recognition for prosocial involvement (e.g., teacher notices when student does a good job and tells student about it) | 2.9 (.6) | 2.8 (.6) |
| Cronbach alpha .49–.72 | | |
| Community risk factors | | |
| Low neighborhood attachment (e.g., desire to leave neighbourhood) | 1.9 (.8) | 2.0 (.8) |
| Community disorganization (e.g., neighborhood described as having crime and/or drug selling) | 1.5 (.5) | 1.5 (.6) |
| Perceived availability of drugs (e.g., student perceives it as easy to obtain cigarettes) | 2.0 (.8) | 2.2 (1.0)* |
| Norms favorable to drug use (e.g., adults think it is not wrong at all for students to smoke cigarettes) | 1.7 (.7)* | 1.6 (.7) |
| Cronbach alpha .76–.91 | | |
| Community protective factors | | |
| Opportunities for prosocial involvement (students can help decide on neighborhood activities and how they are run) | 2.4 (.8) | 2.4 (.8) |
| Recognition for prosocial involvement (e.g., people in neighborhood proud when student does something well) | 2.3 (.9) | 2.4 (.9) |
| Cronbach alpha .68–.87 | | |

Note: Risk and protective factors assessed on a 4-point scale.
* $p < .002$ (Bonferroni adjustment) state differences using (unadjusted) independent samples *t*-test.

identified 15% and 17% of students across the two states at the first and second assessments, respectively.

*Societal responses to antisocial behavior.* Students reported at the first assessment how many times in the past 1 year they had been suspended from school and arrested, from *Never* to *40 or more times* on an eight-point scale. Scores were recoded as present (students had experienced the consequence one or more times in the past year) or absent (students had not experienced the consequence) to form a dichotomous measure of school suspension and being arrested.

*Risk and protective factors.* Individual, family, peer, school, and community-level risk and protective factor scales measured at the first assessment, exemplar items and their Cronbach alphas are shown in Table 1. Most risk factor items are rated on a four-point scale. The response set generally ranged from *definitely no* to *definitely yes*. Exceptions were community norms favorable to drug use and parental and student attitudes favorable to drug use and to antisocial behavior (*very wrong* to *not wrong at all*); perceived availability of drugs (*very hard* to *very easy*); and academic grades (*very poor to very good*). Scores on the "association

Table 2
Percentage (%) of the sample engaging in antisocial behavior at the first assessment and 1-year follow-up and experiencing societal responses at the first assessment

| | Male | | | Female | | |
|---|---|---|---|---|---|---|
| | VIC | WA | $\chi^2$ | VIC | WA | $\chi^2$ |
| Antisocial behavior | | | | | | |
| First assessment | 18.2 | 17.6 | .1 | 10.7 | 11.1 | .1 |
| 1-year follow-up | 21.4 | 19.2 | 1.3 | 11.9 | 13.3 | .8 |
| Social responses (first assessment) | | | | | | |
| Suspension | 10.9 | 16.2 | 10.4** | 6.0 | 5.6 | .2 |
| Arrest | 2.5 | 5.2 | 8.7** | .7 | 1.7 | 3.7 |

Note: VIC = Victoria; WA = Washington State; $\chi^2$ = Chi-square test comparing states within gender.
** $p < .01$.

with antisocial peers" item were transformed from a five-point scale (*none of my friends* to *4 of my friends*) to a four-point scale.

All protective factors were rated on a four-point scale and for most scales, response options ranged from *definitely yes* to *definitely no*. Exceptions were family recognition for prosocial involvement (*never* or *almost never* to *all the time*), and attendance at religious services (religiosity) (*Never* to *About once a week or more*).

*Honesty.* Items included to assess whether students answered the survey honestly were self-assessments of how honest they were when filling out the survey (*all of the time*, *most of the time*, *some of the time*, *once in a while*, or *not honest at all*); or student reports of ever, or in the past 30 days, using a fake drug; or student reports of using illicit drugs on more than 120 occasions in the past 20 days. A single measure of honesty (*yes*/*no*) was calculated using these items.

### *Statistical Analysis*

Few students (23 at the first assessment and 41 at the one-year follow-up) met the criteria for dishonesty. Results presented here include only students who were "honest." Levels of missing data were low and ranged between 1% and 6%. For each risk and protective factor scale, data were imputed using mean substitution if students did not refuse to complete the items. Upon completion of this process, levels of missing data in the analyses were below 1%.

Unadjusted chi-square analyses were conducted to compare the rates of antisocial behavior, school suspensions, and arrests in the two states. Before conducting hierarchical logistic regression analyses, mean scores on risk and protective factors in Washington State and Victoria were compared using independent samples *t*-tests with Bonferroni adjustment. A sequence of hierarchical logistic regression models was used to explore the prediction of antisocial behavior at the one-year follow-up from variables measured at the first assessment. Initially, unadjusted logistic regression analyses tested for bivariate prediction of antisocial behavior from each of the independent variables. A series of multivariate models were then conducted to investigate the predictive utility of each cluster of variables: 1) Demographic variables (gender, age); 2) individual-level risk and protective factors including pre-existing antisocial behavior; 3) family factors; 4) the peer risk factor; 5) school factors; 6) community factors; 7) reports of school suspension and arrest; and 8) state. Finally, all variables were included as multivariate predictors of antisocial behavior to determine the strength of adjusted associations. All analyses were conducted using Stata software [35] and controlled for the clustering of students within schools.

## Results

### *Rates of Antisocial Behavior and Societal Responses*

The percentage of students engaging in antisocial behavior at each time point is reported in Table 2. There were no state differences in the prevalence of antisocial behavior at either of the two assessments. Table 2 shows that, of the four comparisons of societal responses at the first assessment (one each for males and females on school suspensions and arrests), both societal response variables were significantly higher for Washington males and the comparisons for females were not significantly different.

### *Levels of Risk and Protective Factors*

Mean levels of risk and protective factors in each state are presented in Table 1. Bonferroni adjustment was used ($p < .002$) to correct for multiple comparisons on independent *t*-tests. Victorians scored higher than Washington State students on poor family management, favorable parental and student attitudes toward drugs and antisocial behavior, attention/concentration problems, and impulsivity, as well as community norms favorable to drug use. Washington students reported higher scores than Victorian students on religiosity, emotion control, school grades, opportunities for prosocial involvement at school, and perceived availability of drugs within the community. These differences are quite small (.1–.2 on a four-point Likert scale), with the one

exception of religiosity, where the magnitude of the difference is almost one point (.7).

*Correlations Between Risk and Protective Factors*

Intercorrelations between risk and protective factors were generally below .50. Parental attitudes favorable to drugs correlated ($r = .68$) with parental attitudes favorable to antisocial behavior. Students' belief in the moral order was negatively correlated ($r = -.64$) with parental attitudes favorable to antisocial behavior. Attachment to mother was associated with family opportunities for prosocial involvement ($r = .66$). Community recognition for prosocial involvement correlated ($r = .76$) with community opportunities for involvement. Multi-collinearity was checked and was not present in the multivariate logistic regression analyses conducted.

*Predictors of Antisocial Behavior*

The results of unadjusted logistic regression analyses are shown in Model 1 in Table 3. All variables, except state, were significant predictors of antisocial behavior at the one-year follow-up at this bivariate level. Not surprisingly, engaging in antisocial behavior at the first assessment significantly increased the likelihood of engaging in subsequent antisocial behavior. Societal responses at the first assessment increased the likelihood of subsequent antisocial behavior more than five times. Each unit increase in association with antisocial peers elevated the likelihood of antisocial behavior at the one-year follow-up more than sevenfold. Other factors that increased the likelihood of antisocial behavior were student attitudes favorable to drugs and to antisocial behavior, attention problems, impulsivity, parental favorable attitudes to antisocial behavior, family conflict, school grades, community disorganization, perceived availability of drugs in the community, and community norms favorable to drug use. The strongest protective factors were student belief in the moral order and opportunities for prosocial involvement at school; unit increases in both scales decreased the likelihood of antisocial behavior by five times.

The column labeled Model 2 in Table 3 shows the results of testing for the predictive utility of clusters of variables. Antisocial behavior at the first assessment remained a strong predictor of subsequent antisocial behavior, although its odds ratio was reduced by more than half from the unadjusted analyses. School suspension and having been arrested increased the likelihood of subsequent antisocial behavior; again their effects were reduced relative to the unadjusted bivariate analyses. Other risk factors were student age, student attitudes favorable to drugs, concentration/attention problems, poor family management, family conflict, parental attitudes favorable to antisocial behavior, low school grades, and at the community level, community disorganization, perceived availability of drugs, and norms favorable to drug use. The protective factors included being female, student belief in the moral order, student emotional control, attachment to mother, and all school-level protective factors.

Model 3 in Table 3 displays the results of including all of the independent variables as predictors, thus highlighting the unique (but not shared) contribution to explanation of variance in antisocial behavior. Demographic variables were entered first. The clusters of variables were then entered in order of their proximity to the student, from the individual level to the community level. In this multivariate model, risk factors for antisocial behavior were previous antisocial behavior, favorable student attitudes to drugs, association with antisocial peers, low school grades, perceived availability of drugs in the community, and school suspension. Arrest continued to increase the odds of antisocial behavior, but this effect fell just below statistical significance in the fully adjusted model. Being female, student belief in the moral order and student emotion control, and attachment to mother were protective. In this final model, 27% of the variance in antisocial behavior at the one-year follow-up was explained by these variables.

## Discussion

The main finding of this study was that societal responses in the form of school suspensions increase subsequent antisocial behavior. Further, this study confirmed risk and protective factors identified in earlier studies (see Table 4 for summary of the multivariate predictors in this study). This study also showed that, although the rates of self-reported antisocial behavior were similar in Victoria and Washington State, state differences in students' experiences of school suspension and arrests exist, with males from Washington State relative to Victoria experiencing more arrests and more school suspensions at the first assessment.

Why school suspension exacerbated antisocial behavior in this sample is unclear and requires additional research. Perhaps students who experience suspension rebel by engaging in further antisocial behavior. Alternatively, it is possible that suspending students from school may disconnect them from a positive social environment and increase their exposure to other risk factors for antisocial behavior (e.g., failure to complete schooling) [28]. Students who are suspended from school may also experience a negative stigma within the school community [11]. Another possibility is that school suspension increases problematic antisocial behavior by promoting interaction between like-minded deviant young people, for example, by providing the opportunity for those suspended to meet together while excluded from school. Assisting high-risk youth to maintain links with school and facilitating interactions with nondeviant peers may be important. It is also possible that the measures of societal responses used here simply reflect prior antisocial behavior, hence an association between the two is

Table 3
Results of logistic regression analyses predicting antisocial behavior at 1-year follow-up from independent variables measured at first assessment (n = 3655)

| | Model 1 Unadjusted model | Model 2 Regressions within each domain | Model 3 Fully adjusted model |
|---|---|---|---|
| | OR (95% CI) | OR (95% CI) | OR (95% CI) |
| Demographic characteristics | | | |
| Female | .6 (.5–.7)*** | .6 (.5–.7)*** | .7 (.5–.9)** |
| Age | 1.2 (1.1–1.4)*** | 1.2 (1.1–1.3)*** | .9 (.8–1.0) |
| Variance explained | | 1.9% | — |
| Individual risk factors | | | |
| Antisocial behavior | 12.1 (9.7–15.1)*** | 5.9 (4.6–7.6)*** | 3.6 (2.7–4.7)*** |
| Favorable attitude, antisocial | 4.2 (3.5–5.1)*** | 1.1 (.9–1.4) | 1.1 (.8–1.5) |
| Favorable attitude, drugs | 3.1 (2.7–3.6)*** | 1.5 (1.2–1.8)*** | 1.3 (1.1–1.7)* |
| Attention/concentration problems | 2.0 (1.8–2.2)*** | 1.2 (1.0–1.4)* | 1.1 (.9–1.2) |
| Impulsivity | 2.9 (2.5–3.4)*** | 1.1 (.9–1.4) | 1.0 (.8–1.3) |
| Individual protective factors | | | |
| Religiosity | .9 (.8–.9)** | 1.0 (.9–1.1) | 1.0 (.9–1.1) |
| Belief in the moral order | .2 (.2–.3)*** | .6 (.5–.7)*** | .8 (.6–1.0)* |
| Emotion control | .5 (.4–.6)*** | .7 (.6–.9)** | .7 (.6–.8)*** |
| Variance explained | | 23.0% | — |
| Family risk factors | | | |
| Poor family management | 4.0 (3.4–4.7)*** | 2.5 (1.9–3.4)*** | 1.2 (.9–1.6) |
| Family conflict | 2.0 (1.8–2.2)*** | 1.5 (1.3–1.7)*** | 1.1 (1.0–1.3) |
| Parent favorable attitude to drugs | 2.2 (1.9–2.6)*** | 1.2 (1.0–1.4) | .8 (.7–1.1) |
| Parent favorable attitude to antisocial | 3.0 (2.5–3.6)*** | 1.7 (1.4–2.2)*** | 1.2 (.9–1.5) |
| Family protective factors | | | |
| Attachment to mother | .5 (.5–.6)*** | .8 (.7–.9)** | .8 (.7–1.0)* |
| Attachment to father | .7 (.6–.7)*** | 1.0 (.8–1.1) | 1.1 (.9–1.2) |
| Opportunities for prosocial | .5 (.5–.6)*** | 1.1 (.9–1.4) | 1.2 (.9–1.5) |
| Recognition for prosocial | .6 (.5–.7)*** | 1.0 (.9–1.1) | 1.0 (.8–1.1) |
| Variance explained | | 11.6% | — |
| Peer risk factors | | | |
| Association with antisocial peers | 7.4 (5.7–9.6)*** | 7.4 (5.7–9.6)*** | 1.8 (1.4–2.4)*** |
| Variance explained | | 13.1% | — |
| School risk factors | | | |
| School grades | 2.2 (2.0–2.5)*** | 2.1 (1.8–2.3)*** | 1.3 (1.1–1.5)** |
| School protective factors | | | |
| Opportunities for prosocial | .4 (.4–.5)*** | .7 (.5–.9)** | 1.1 (.8–1.5) |
| Recognition for prosocial | .5 (.4–.6)*** | .7 (.5–.8)*** | 1.1 (.8–1.4) |
| Variance explained | | 6.7% | — |
| Community risk factors | | | |
| Low neighborhood attachment | 1.6 (1.4–1.7)*** | 1.1 (1.0–1.3) | 1.0 (.9–1.2) |
| Community disorganization | 2.2 (1.9–2.5)*** | 1.4 (1.2–1.7)*** | 1.0 (.9–1.3) |
| Perceived availability of drugs | 2.3 (2.1–2.6)*** | 1.9 (1.7–2.2)*** | 1.3 (1.1–1.5)*** |
| Norms favorable to drug use | 2.0 (1.8–2.2)*** | 1.4 (1.2–1.5)*** | 1.0 (.9–1.2) |
| Community protective factor | | | |
| Opportunities for prosocial | .7 (.6–.7)*** | .9 (.7–1.1) | .9 (.7–1.1) |
| Recognition for prosocial | .8 (.7–.8)*** | 1.0 (.8–1.2) | 1.1 (.9–1.4) |
| Variance explained | | 11.0% | — |
| Societal responses | | | |
| School suspension | 5.4 (4.3–7.0)*** | 4.6 (3.5–5.9)*** | 1.5 (1.1–2.1)* |
| Arrest | 7.5 (4.8–11.8)*** | 3.9 (2.3–6.6)*** | 1.7 (.9–3.1) |
| Variance explained | | 6.7% | — |
| State | | | |
| Washington | 1.0 (.8–1.2) | 1.0 (.8–1.2) | .9 (.7–1.2) |
| Variance explained | | 0.0% | 27.1% |

Model 1 shows univariate prediction of antisocial behavior, Model 2 multivariate adjusted analyses for variables listed in each domain (e.g., individual factors), and Model 3 multivariate adjusted analyses for all variables in the Table.

For Model 3, adding each domain except state was significant: individual risk and protective factors change in $\chi^2$ (8) = 473.80, $p < .001$, $R^2$ change = .22; family risk and protective factors, change in $\chi^2$ (8) = 71.59, $p < .001$, $R^2$ change = .01; peer risk factor, change in $\chi^2$ (1) = −25.27, $p < .001$, $R^2$ change = .014; school risk and protective factors, change in $\chi^2$ (3) = 26.83, $p < .001$, $R^2$ change = .004; community risk and protective factors, change in $\chi^2$ (6) = 37.32, $p < .001$, $R^2$ change = .005; and school suspension and arrest, change in $\chi^2$ (2) = 7.05; $p < .05$, $R^2$ change = .003.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4
Summary of risk and protective factors predictive of antisocial behavior at 1-year follow-up in multivariate adjusted analyses

| Risk factors | Protective factors |
|---|---|
| Antisocial behavior at first assessment | Being female |
| Student favorable attitudes to drugs | Student belief in the moral order |
| Association with antisocial peers | Student emotional control |
| Low school grades | Attachment to mother |
| Perceived availability of drugs in the community | |
| School suspension at first assessment | |

to be expected. However, we controlled for prior antisocial behavior in examining the relationship with subsequent antisocial behavior.

In both states there are a range of methods that *may* be used as alternatives to out-of-school suspensions. These include in-school suspensions (student sits outside the Principal's office or in the office area with work to complete), time out in off-site "teaching units" for periods of time, withdrawal of privileges (e.g., school camp, school excursions), writing a contract stating the terms under which the student can remain at school (e.g., attend counseling, anger management training), and recommending that a student move to another school for a new start to keep the student connected to school. More recently, a restorative justice approach to behavior has been used in Victoria. Restorative justice approaches focus on restoring the losses experienced by victims and holding the offending student accountable for the harm s/he has caused and may involve exploration of a number of possible options.

The risk factors identified in this study as explaining unique portions of the variance in antisocial behavior were pre-existing antisocial behavior, favorable student attitudes toward drugs, association with antisocial peers, poor school grades, and perceived availability of drugs within the community. These factors confirm those found to have strong relationships in previous studies [7,25,36]. Earlier-occurring antisocial behavior was predictive of the same behavior one year later, emphasizing the importance of intervening early when signs of antisocial behavior develop. Favorable student attitudes toward drugs increased the likelihood of antisocial behavior. Taking steps to modify student attitudes toward drugs and related behaviors may also reduce subsequent antisocial behavior. This study also found that association with antisocial peers was a risk factor for subsequent antisocial behavior. Finding ways to link vulnerable youth with positive peer networks may reduce antisocial behavior. Poor school grades and perceived community availability of drugs also were significant risk factors for antisocial behavior. Providing remediation for failing students and reducing the availability of drugs in the community may also reduce antisocial behavior. It is interesting that family risk factors were no longer influential when other factors were included. However, this finding is consistent with the well-recognized shift in adolescence toward independence [37].

Importantly, this study also identified several factors that reduce the likelihood of developing antisocial behavior, including student belief in the moral order, the student's ability to control emotions in difficult situations, and attachment to mother. These findings suggest clear targets for efforts to foster attitudes and skills in adolescents to minimize the likelihood of antisocial behavior, as well as forming positive links between parents and their children. The results support targeting multiple levels of risk and protective factors for effective prevention.

The amount of variance explained in this study was moderate (27%), suggesting that other factors are also important in the development of antisocial behavior. Student cognitions were not assessed here and have been shown [38] to be important in the development of antisocial behavior. Genetic and biological factors may also have a role; studies that integrate psychosocial and biological factors are crucial [39]. Situational influences to engage in crime, such as finding unsecured valuables, are among other variables that have been previously identified [40] but were not measured here. To provide further evidence of a causal relationship between school suspensions and later antisocial behavior, future research could assess the numbers of suspensions between the first assessment and one-year follow-up, rather than at the first assessment only.

## Conclusions

In summary, these results have important implications for practice and policy. Self-reported school suspension and arrests were higher in Washington State than Victoria but in both states, only school suspension significantly increased the likelihood of subsequent antisocial behavior after controlling for a wide variety of risk and protective factors. Although the findings require replication, it seems that early exposure to school suspension may increase subsequent antisocial behavior. A more direct test of this finding would be to conduct a controlled trial of school suspension policies. Other ways for schools to deal with problematic behavior may be needed. Effective methods schools can adopt include, for example, changes in teaching and classroom management practices to improve academic achievement [8,26], a restorative justice approach to behavior, and reorganization of school programs and policies [26].

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