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## Does school suspension affect subsequent youth nonviolent antisocial behavior? A longitudinal study of students in Victoria, Australia and Washington State, United States

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### Abstract

School suspension has been not only associated with negative behaviours but is predictive of future poor outcomes. The current study investigates a) whether school suspension is a unique predictor of youth nonviolent antisocial behaviour (NVAB) relative to other established predictors, and b) whether the predictors of NVAB are similar in Australia and the United States (U.S.). The data analysed here draws on two state-wide representative samples of Grade 7 and 9 students in Victoria, Australia and Washington State, U.S., resurveyed at 12-month follow-up (N = 3,677, 99% retention). School suspension did not uniquely predict NVAB in the final model. The predictors of NVAB, similar across states, included previous student NVAB; current alcohol and tobacco use; poor family management; association with antisocial friends; and low commitment to school. An implication of the findings is that U.S. evidence-based prevention programs targeting the influences investigated here could be trialled in Australia.

## Keywords

adolescents; antisocial behaviour; cross-cultural study; predictors; school suspension

The management of student antisocial behaviours, including stealing, talking back to the teacher, disruptive classroom behaviour, and truancy, is an issue that most schools face. One management tool available is exclusion from school through the use of suspension and expulsion. Research shows that exclusionary practices, including out-of-school suspension, are commonly relied upon in many schools in both Australia and the United States (U.S) (Angus et al., 2010; Christle, Nelson, & Jolivette, 2004; Hemphill et al., 2007). For example, 16% and 11% of boys in Washington State, U.S and Victoria, Australia report being suspended from school in the past year. Rates for girls in these two states are around 6% (Hemphill, Toumbourou, Herrenkohl, McMorris & Catalano, 2006). Research in the United Kingdom (U.K) and U.S has shown the rates of school suspension are increasing (American Academy of Pediatrics Committee on School Health, 2003; Department for Children Schools and Families, 2008). The most common behaviours resulting in suspension in the U.K, U.S, and Australia are acts of physical violence, as well as nonviolent behaviours such as disruptive behaviour, persistent misbehaviour and other related behaviours (Department for Education, 2011; New South Wales Department of Education and Training, 2008; Rausch & Skiba, 2004). Hence, the use of school suspension is not always reserved for the most serious behavioural problems.

School suspension has been associated with a variety of negative consequences for suspended students including a higher risk of academic failure and school dropout (Arcia, 2006), disengagement from school (Butler, Bond, Drew, Krelle, & Seal, 2005), and failure to graduate on time (Rafaelle Mendez 2003). Suspended students are also at a greater risk of alienation from school, alcohol and drug use, and future antisocial behaviour (American Academy of Pediatrics Committee on School Health, 2003; Costenbader & Markson, 1998; Hemphill, Heerde, Herrenkohl, Toumbourou, & Catalano, 2011; Hemphill et al., 2009; Hemphill, et al., 2006). However, rarely have the longitudinal effects of school suspension on student behaviour, particularly nonviolent antisocial behaviour (NVAB), been examined within a prospective study using representative samples. Of the longitudinal studies previously conducted, few have comprehensive data on the range of relevant predictors that can influence student behaviour to examine the relative importance of school suspension in comparison with other factors. This paper will address these gaps in the current literature by examining the longitudinal effects of school suspension on NVAB in a study of students in Victoria, Australia and Washington State.

## NVAB

Antisocial behaviour occurring in adolescence is defined as any behaviour that violates personal rights and societal rules and conventions for maintaining public order (e.g., Kazdin, 1987), and ranges from criminal acts such as physical violence, property offences, and illicit drug use, to socially unacceptable behaviours such as truancy. Several studies acknowledge the importance of distinguishing between violent and nonviolent antisocial behaviour (Farrington & Loeber, 2000; Loeber & Stouthamer-Loeber, 1998; Maughan, Pickles, Rowe,

Costello, & Angold, 2000), and studies examining predictors specific to nonviolent forms of antisocial behaviour have been conducted (Capaldi & Patterson, 1996; Henry, Caspi, Moffitt, & Silva, 1996; Smart et al., 2003). Loeber and Stouthamer-Loeber, (1998) argued that because there are differences in behaviour patterns, emotions, and cognitions, as well as evidence that factors related to violent and nonviolent antisocial behaviour may differ, distinctions between the two are reasonable. Adolescent self-reports and official statistics show that NVAB constitute the majority of antisocial behaviours committed by young people, with various forms of theft being the most common (Farrington, 1996; Hemphill et al., 2007; Hill, Wright, D'Costa, Taylor, & Aryeo, 2003; Hua, Baker, & Poynton, 2006; Snyder & Sickmund, 2006). According to the law, NVAB is characterized by offences against property rather than persons, such as theft (Broidy et al., 2003) or illicit drug use and dealing (Henry et al., 1996), and is often covert in nature (Kjelsberg, 2002; Loeber & Stouthamer-Loeber, 1998). Consistent with the legal definitions, this paper uses the term NVAB to describe behaviours that do not involve direct physical confrontation with a victim but have potentially serious consequences including stealing, vehicle theft, selling of illicit substances, and being drunk or high at school. NVAB incurs considerable costs to society, including property loss and damage, medical and psychological effects on victims and others, hospitalisation and treatment in relation to drug-related offences, policing and prison costs, and a wide array of indirect social costs, including productivity loss and security and insurance costs (Rollings, 2008; Welsh et al., 2008).

### **The effects of school suspension**

Despite its widespread use in schools, suspension can have serious, unintended negative consequences for the suspended student across a range of domains including educational outcomes and problem behaviours (American Academy of Pediatrics Committee on School Health, 2003; Arcia, 2006; Butler, et al., 2005; Costenbader & Markson, 1998; Hemphill, et al., 2011; Hemphill, et al., 2009; Hemphill, et al., 2006; Rafaele Mendez, 2003; Skiba & Rausch, 2006). Suspension has also been shown to be a risk factor for delinquency and future imprisonment. In separate studies, it has been demonstrated that school suspension increases the likelihood of the student engaging in antisocial behaviour (that includes violent and nonviolent behaviour) and violent behaviour 12 months later, even after controlling for a comprehensive range of established influences, including school factors such as academic failure and low commitment to school (Hemphill, et al., 2009; Hemphill, et al., 2006). Similarly, an examination of the impact of secondary school experiences on the likelihood of future incarceration showed that individuals who had been suspended from school were 2.2 times more likely to be incarcerated in the future compared with non-suspended students (Arum & Beattie, 1999) after controlling for other school and social structural variables. Such findings demonstrate that the negative impacts of school suspension on behavioural outcomes for young people transcend the school environment and have the potential to increase the probability of young people engaging in serious offences.

There are theoretical grounds to expect that in some contexts suspension may increase antisocial behaviour. Consistent with deterrence theory, school suspension is implemented in schools to deter both the student suspended and other students from engaging in similar behaviour in the future. However, according to behavioural reinforcement theory there is the

potential for students to perceive suspension from school as a positive reinforcer (e.g., a day off school to engage in activities they enjoy) rather than as a deterrent (as intended by adults). According to reinforcement theory, behaviour that is reinforced is likely to be repeated and behaviour that is not reinforced is not likely to be repeated. For some students, suspension may increase positive expectancies and attitudes about antisocial behaviour and in this way increase student motives for participation in antisocial and related behaviours. For example, in a survey of high school students' use of illegal substances, Paternoster and Piquero (1995) found that although successful avoidance of punishment by the student encouraged offending as expected, contrary to deterrence theory, personal experience with punishment also encouraged offending. In addition, the process of school suspension can lead young people to feel alienated from the school setting that excluded them and to become involved with antisocial peers. Differential association theory postulates that a young person commits antisocial behaviour when in the company of others who endorse and reinforce the behaviour (Shoemaker, 2004; Sutherland, 1947). Students suspended from school have time to interact with antisocial peers who are not attending school. Peer involvement is particularly likely when parents are working or otherwise unable to monitor the whereabouts and social interactions of their children during the suspension period. Based on the above theoretical grounds and prior research findings that school suspension predicted a general measure of antisocial behaviour that included both NVAB and violent behaviour (Hemphill et al., 2009), there is a clear need for prospective, longitudinal studies in this area (American Psychological Association Zero Tolerance Task Force, 2008), to investigate whether suspension may predict NVAB. The central question in this paper is whether school suspension predicts NVAB after controlling for established risk and protective factors for NVAB, including those in the individual student, peer group, family, and school domains.

## Risk and protective factors

A common approach to studying the development of antisocial behaviour is to examine the impact of risk and protective factors on behaviour. *Risk factors* are prospective predictors that increase the likelihood that an individual or group will engage in behaviours that lead to adverse outcomes (Hawkins, Catalano, & Miller, 1992; National Crime Prevention, 1999; National Research Council and Institute of Medicine, 2009). *Protective factors* are variables that both directly decrease the likelihood of adverse outcomes (Jessor, Turbin, & Costa, 1998; Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995), and mediate or moderate the influence of risk factors (Garmezy, 1985; Rutter, 1985). Both types of factors have been linked to NVAB and typically span the individual, family, peer group, school, and community domains (Catalano & Hawkins, 1996; Homel et al., 1999; Youngblade et al., 2007). Consistent with ecological perspectives, in this paper risk and protective factors are organised according to their influence across developmental periods and socializing contexts (Catalano & Hawkins, 1996).

## Predictors of NVAB

A consistent finding in several studies is that the best predictor of current behaviour is past behaviour; that is, there is continuity across time for NVAB (Ellickson & McGuigan, 2000;

Farrington, 1998; Farrington & Loeber, 2000). Additional influences on NVAB are student alcohol and tobacco use (Arnett, 1996; Pfefferbaum & Wood, 1994), along with the student having attitudes favourable to engaging in antisocial behaviour (Hawkins et al., 1992; Loeber, Stouthamer-Loeber, Van Kammen, & Farrington, 1991; Simcha Fagan, Gersten, & Langner, 1986; Smart et al., 2003). Low commitment to school and difficulties at school have been consistently related to NVAB (Ellickson & McGuigan, 2000; Smart et al., 2003). Within the family domain, poor family management, family conflict, and poor child-parent relationships have been shown to influence NVAB (Hawkins et al., 1992; Loeber et al., 1991; Simcha Fagan et al., 1986; Smart et al., 2003). The peer environment, in the form of associating with antisocial friends, is an established risk factor for antisocial behaviour (e.g., Hawkins et al., 2000; Hemphill et al., 2009; Hemphill et al., 2006; Smart et al., 2003).

In the current paper, protective factors in the family and school domains were included to inform prevention approaches that not only seek to reduce NVAB but also aim to increase positive behaviours. Young people living in families where there is support and positive opportunities for involvement are less likely to engage in antisocial behaviour (Perrone, Sullivan, Pratt, & Margaryan, 2004; Wright & Cullen, 2001). Positive family engagement promotes conditions favourable to the development of prosocial behaviour and protects students from the potentially negative effects of antisocial peers and engaging in antisocial behaviour (Perrone et al., 2004; Wright & Cullen, 2001). Likewise, the positive impact of bonding with a school environment that provides opportunities for positive involvement is well established (Catalano & Hawkins, 1996; Hirschfield & Gasper, 2011; Hoffmann & Dufur, 2008).

## International comparison studies of adolescent NVAB

Rates of youth NVAB (i.e., stealing, selling illegal drugs, being drunk or high at school) are broadly similar in Australia and the United States (U.S.) (Bond, Thomas, Toumbourou, Patton, & Catalano, 2000; Hemphill et al., 2007; McMorris, Hemphill, Toumbourou, Catalano, & Patton, 2007; RMC Research Corporation, 2004). However, it is unclear whether the predictors of youth NVAB are also similar, given that previous longitudinal research has predominantly been conducted in the U.S. Few methodologically rigorous cross-national studies of the factors that influence adolescent NVAB have been conducted to date. Examining the similarities and differences in the predictors of NVAB across North America and other countries has important implications for whether similar targets for crime prevention approaches are applicable in other countries. International comparative studies are also essential to distinguish between universal and context-specific influences on behaviour across countries and cultures (Jessor et al., 2003; Unger et al., 2002).

Studies from North America, the United Kingdom, and Australia find many similarities across a broad range of influences (within the young person, and his/her family, peer group, school, and community) (Hawkins et al., 2000). The Office of Juvenile Justice and Delinquency Prevention's Study Group on Serious and Violent Juvenile Offenders (Hawkins et al., 2000) found the best predictors of adolescent antisocial behaviours included early-onset (from 6 to 11 years old) nonviolent and violent behaviour, substance use, lack of social ties, and involvement with antisocial peers. Junger-Tas, Marshall, and Ribeaud (2003)

reported that poor relationships with parents were related to serious delinquency and to drug use in Anglo-Saxon, Southern European and North-West European countries. However, there are some cross-national differences in the importance of specific predictors. For example, Junger-Tas et al. (2003) noted that father absence was closely associated with delinquent behaviour in Anglo-Saxon and Southern European countries, but not in North-West Europe. The authors of the current paper do not know of any other study that has systematically compared predictors of youth NVAB in Australia and the U.S. using state-wide representative samples of youth.

## The current paper

In this paper, the impact of school suspension on NVAB relative to other predictors is examined across a 12-month period in state-wide representative samples of Grade 7 and 9 students in Washington State, U.S. and Victoria, Australia. Further, the similarities and differences in predictors of NVAB in the two states are investigated. Data for the current paper are drawn from the International Youth Development Study (IYDS), a prospective cross-national study that uses standardised methodologies to overcome common methodological limitations of many previous cross-national comparisons (Pirkis, Irwin, Brindis, Patton, & Sawyer, 2003). Victoria and Washington State were chosen due to their similarities on a range of population demographic and economic characteristics (McMorris et al., 2007), as well as for their differences around substance use and problem behaviour policies (e.g., Hemphill et al., 2006). Consistent with the U.S. policy setting, Washington State schools adopt zero-tolerance approaches to managing challenging student behaviour. Such approaches seek to reduce challenging behaviours primarily through deterrence by purporting to send a clear message to the school community that certain behaviours will not be tolerated and will incur serious consequences. At the time of the current study (2002 - 2003), in Victorian schools the emphasis was on ensuring that disciplinary actions do not negatively impact on students' studies, and *suspension* from school was not usually implemented unless other disciplinary measures have been unsuccessful (Directorate of School Education, 1994). The emphasis was on discipline rather than punishment. The code of conduct for students set out ways of highlighting and promoting positive student behaviour, as well as detailing discipline procedures (Directorate of School Education, 1994).

School suspension may impact student behaviour in ways that *reduce* subsequent problem behaviour (e.g., deter students from participating in further problematic behaviour because of fear of repeated punishment) (Casella, 2003), or *increase* problematic behaviour by interrupting students' connections to school, increasing suspended students' contact with antisocial peers, and increasing rebelliousness (Casella, 2003; Costenbader & Markson, 1998). As reviewed above, school suspension has been linked to a general measure of antisocial behaviour so is likely to be associated with NVAB. Given the differing policy contexts of the two countries, it is possible that school suspension may have differing cross-national impacts. Comparative cross-national studies of these two states with different policy approaches are helpful in providing added variation to examine predictive effects and for establishing whether effects are cross-nationally similar or different.

The main research question in this paper is whether school suspension predicts NVAB after controlling for established risk and protective factors for NVAB. The secondary research question is whether the predictors of NVAB are different in Victoria and Washington State. There are two main hypotheses in this paper:

1. School suspension will predict NVAB over and above other risk and protective factors
2. The predictors of youth NVAB in the two states will be similar.

## Method

### Participants

To obtain state-representative samples in 2002, a two-stage cluster sampling approach was utilized. In the first stage, within each state and grade level, 60 public and private schools containing Grades 5, 7, or 9 were randomly selected using a probability proportionate to grade-level size sampling procedure (Kish, 1965). A target classroom within each school was randomly selected in the second stage. Further details about recruitment and participation rates are available in McMorris et al. (2007).

A total sample of 5,769 students across the three age cohorts (Grades 5, 7, and 9) participated in the study: 2,885 students in Washington State and 2,884 students in Victoria. Data for the current study are from only seventh-grade ( $n = 912$ , Victoria;  $n = 891$  Washington) and ninth-grade ( $n = 927$ , Victoria;  $n = 948$ , Washington) students who completed the first (2002) and second (2003) survey. Fifth-grade students in both states were not included in the analyses because of the low prevalence of NVAB and school suspension within this group. Males and females were equally represented in each state and cohort. Grade 7 students consisted of mostly 12- and 13-year-olds ( $M = 12.9$ ,  $SD = 0.4$ , Victoria;  $M = 13.1$ ,  $SD = 0.4$ , Washington), and Grade 9 students of mostly 14- and 15-year-olds ( $M = 14.9$ ,  $SD = 0.4$ , Victoria;  $M = 15.1$ ,  $SD = 0.5$ , Washington). Ethnicity was measured differently in each state. In Victoria, most students identified as Australians if they had been in the country for a number of years, with foreign born students typically identifying by country of origin. This led to approximately 90% of students identified as Caucasian, 5% as Asian, and 5% from other countries of origin. In Washington State, around 65% of students identified as White and the most common ethnicities were Hispanic/Latino, Asian, and Native American. In both states, the rate of students living in low-income households (income  $< \$30,000$ ) was 22%. There were state differences in the percentage of students living in sole-parent households, 20% in Victoria, and 24% in Washington State ( $p < .01$ ), and in workless households (no parent in employment), 9% in Victoria and 19% in Washington State ( $p < .001$ ). At the one-year follow-up, retention rates were 99% for both cohorts in both states.

### Procedure

Permission to conduct the research in Victorian schools was obtained from the Royal Children's Hospital Ethics in Human Research Committee, Department of Education and Training for government (public) schools, the Catholic Education Office for some private



schools, and then from school principals. In Washington State, the Institutional Review Board at the University of Washington approved research protocols, and permission to recruit schools was obtained from school districts containing sample schools and then from principals. All parents provided written consent for the participation of their child in the study and students provided their assent. To control for seasonal effects, study staff administered surveys in 2002 and 2003 from February to June in Washington State and from May to November in Victoria. All research staff in both states were trained in a single protocol to minimize procedural differences. The pen-and-paper survey included instructions on how to answer the questions and assurances of confidentiality that were presented prior to administration by study staff. Surveys were group administered in classrooms during a 50- to 60-minute period. Absent students completed the survey under the supervision of trained school personnel or, in a small percentage of cases, over the telephone by study staff (less than 3% at the first survey, less than 4% at 12-month follow-up). Students in Victoria received small thank-you gifts (i.e., a pocket calculator in 2002 and a stress ball in 2003), and Washington State students received \$10.

## Measures

The self-reported measures of NVAB and the risk and protective factors, including school suspension, were obtained from the *Communities That Care* survey, which has been found to have acceptable psychometric properties (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002; Glaser, Van Horn, Arthur, Hawkins, & Catalano, 2005; Pollard, Hawkins, & Arthur, 1999), and has been carefully adapted to the Australian context using cognitive pretesting and pilot testing (McMorris et al., 2007).

**Nonviolent antisocial behaviour (NVAB)**—NVAB was measured at the first survey and 12-month follow-up by asking students how many times in the previous 12 months they had stolen something worth more than US\$5/AUD\$10, sold illegal drugs, stolen or tried to steal a motor vehicle such as a car or motorcycle, and had been drunk or high at school. Responses were rated on an 8-point scale ranging from *Never* to *40 or more times*. Items were recoded as present (1 = students engaged in NVAB one or more times in the past year) or absent (0 = students never engaged in the NVAB listed) to form a dichotomous measure of NVAB. Including a separate measure of NVAB was supported since this measure correlated 0.31 or less with first and second survey violent behaviour and 0.66 or less with first and second survey measures of general antisocial behaviour.

**Risk and protective factors**—The risk and protective factors included in the study at the first survey included those from across individual, family, peer group, and school domains. Item responses relating to risk and protective factors were generally rated on 4-point scales. Details about the factors including example items and descriptive statistics are listed in Table 1. Due to the positively skewed distribution of scores for some factors, association with antisocial friends, current alcohol use, tobacco use, and cannabis use were dichotomised for the analyses (1 = risk factor present, 0 = risk factor absent). School suspension was measured by asking how many times in the past 12 months students were suspended from school. A dichotomous measure of school suspensions was formed (1 =

students had been suspended one or more times in the past year, or 0 = students had not been suspended).

### Statistical Analysis

**Student honesty**—Drawn from early studies of the development and validity of the *Communities That Care* youth survey (Arthur et al., 2002), items were included to assess whether or not students answered the survey questions honestly. Students were categorized as dishonest if they reported any of the following: (a) that they were *not honest at all* when filling out the survey; (b) that they had used a fake drug in their lifetime or in the past 30 days; or (c) that they had used illicit drugs on more than 120 occasions in the past 30 days. A single, dichotomous measure of honesty was calculated using these items. Few students (17 at the first survey only, 35 at 12-month follow-up only, and 6 at both the first survey and 12-month follow up) met the criteria for dishonesty. Results presented here include only students who were “honest.”

Since levels of missing data were low and ranged between 1% and 6% for participants with missing data on a particular risk and protective factor scale, the mean score corresponding to the state, gender, and grade level of the participant was used to impute missing scores on predictor variables. Upon completion of this process, levels of missing data in the analyses were below 1%, and data analyses used complete case analysis. The pattern of results did not change following the use of mean substitution as a method of data imputation. The sample size available for analysis was 3,677.

All analyses were conducted using Stata software version 11 (StataCorp, 2005). To compare the rates of NVAB at each survey, unadjusted chi-square analyses were conducted. The mean scores on risk and protective factors in Washington State and Victoria were compared using independent samples *t*-tests, with the exception of current alcohol use, tobacco use, cannabis use, association with antisocial friends, and school suspension; frequencies on these variables were compared using chi-square analyses.

Descriptive analyses were followed by unadjusted logistic regression analyses to examine whether each risk and protective factor in the first survey predicted NVAB at 12-month follow-up. Next, hierarchical logistic regression analyses were performed, controlling for age, gender, school clustering, and first-survey NVAB. Risk factors grouped by socialisation domain were then sequentially added to the regression analyses in the following order from the most to least proximal influence on students: social response (school suspension), student demographic characteristics, students' behaviours and attitudes, peer group, family, and school. School suspension was entered first in the logistic regression analyses to determine its unique influence on NVAB independent of all the other risk and protective factors in this study, and at which point in the analyses suspension may cease to be predictive of NVAB.

To investigate whether the impact of the risk factors, including school suspension, on NVAB was similar in the two states, a third set of logistic regression analyses predicting second-survey NVAB was conducted to test interaction effects between state and each first-survey risk/protective factor by multiplying each risk factor by state (coded 0 and 1).

Statistically significant interaction terms from these regression analyses were added in a new final step to the fully adjusted model. The amount of variation explained for the model with interactions was highly similar to the model without interactions (Pseudo  $R^2 = 0.23$  and  $0.24$ , respectively), showing that the inclusion of interaction terms had minimal effect on the multivariate model. Hence, the fully adjusted analyses presented in this paper show the more parsimonious model without interaction terms (both states included).

## Results

### Levels of risk and protective factors in the two states

Table 1 showed that Victorian students scored higher than Washington State students on favourable attitudes toward antisocial behaviour, poor family management, current alcohol use, and current tobacco use. Conversely, Washington State students scored higher than Victorian students on opportunities for prosocial school involvement, current cannabis use, association with antisocial friends, and school suspension. Due to the large sample size, mean differences, while statistically significant, are quite small (0.06 on a 4-point scale), although dichotomous variables show sizable differences in percentages for substance use, school suspension, and association with antisocial friends.

### Levels of NVAB in Victoria and Washington State

Table 2 shows state differences in the rates of NVAB at both time points. In the total sample, the rate of NVAB was higher for Washington State at the first survey and at the 12-month follow-up. When broken down by grade and gender, only two of the eight comparisons are significant. The rate of NVAB was higher for Grade 7 Washington State boys than their Victorian counterparts at the first survey, but there were no differences at 12-month follow-up. There were also no differences in rates of NVAB for Grade 7 girls at either time point. The rates of NVAB were also higher for Grade 9 Washington State boys than for Grade 9 Victorian boys; however, no differences were found at 12-month follow-up for both boys and girls. At both the first and second survey in both states, the most common NVAB reported were stealing smaller items (11.6% and 12.7% respectively in Victoria; 13.5% and 15.3% respectively in Washington State) and being drunk or high at school (4.9% and 5.8% respectively in Victoria; 6.4% and 9.1% respectively in Washington State). The rates of vehicle theft and selling illegal drugs were at most 3% in both states for the first and second surveys.

### Correlations between risk and protective factors

In both states, intercorrelations between all risk and protective factors were generally moderate and below 0.55. Given that no correlations exceeded 0.80, bivariate associations did not indicate problems with multicollinearity (Tabachnick & Fidell, 2001).

### Predictors of NVAB

Table 3 displays the results of unadjusted regression analyses for each state. Across both states, all variables, except gender, were predictors of NVAB at the one-year follow-up. Engaging in NVAB at the first survey predicted engaging in subsequent NVAB, with an 11- to an almost 13-fold increased odds in Washington State and Victoria, respectively. School

suspensions increased the odds of NVAB threefold in Washington State and almost fivefold in Victoria. The risk factors for NVAB with odds ratios over 2 in both states were alcohol, tobacco, and cannabis use, favourable student attitudes towards antisocial behaviour, poor family management, association with antisocial friends, and low commitment to school. The protective factors with odds ratios at 0.60 or lower were opportunities for prosocial involvement in the family and at school.

Table 4 displays the results for the entire sample, including all of the independent variables as predictors, and highlights the unique contribution to explanation of variance in NVAB. School suspension was a predictor of NVAB until Model 5 when association with antisocial peers was added to the analyses. In the fully adjusted model (Model 6), unique risk factors for NVAB were NVAB at the first survey, current alcohol and tobacco use, poor family management, association with antisocial friends, and low commitment to school. NVAB at the first survey was the strongest predictor of subsequent NVAB, increasing the odds of NVAB 12 months later fivefold. School suspension was not a statistically significant predictor of NVAB at the second survey over and above other risk and protective factors.

## Discussion

In this paper the results are reported of the first study, to the authors' knowledge, using rigorous methodology to examine the impact of school suspension on NVAB across a 12-month period. Contrary to the first hypothesis, school suspension did not uniquely predict NVAB over and above other influences however it remained a predictor until the addition of association with antisocial peers to the analyses. Consistent with the second hypothesis, the modifiable risk and protective factors for student-reported NVAB are similar in the two states. Predictors in this study included a range of factors spanning individual student characteristics, the peer group, and family and school contexts. International studies like the one reported here are important to examine the commonality of predictors of NVAB in different cultural contexts.

Contrary to the first hypothesis, school suspension did not predict subsequent NVAB over and above other risk and protective factors. The test of the effects of school suspension on NVAB in this study was rigorous given that it partialled out the effects of earlier NVAB. The findings of the current study are in contrast to results showing that school suspension increases the likelihood of violent behaviour and general antisocial behaviour that includes both violent and nonviolent antisocial behaviour (Hemphill et al., 2009; Hemphill et al., 2006) using similar rigorous tests. However, in unadjusted analyses reported here, the relationship between school suspension and NVAB was strong, suggesting that for NVAB, other characteristics of the student, peer group, family, and school were more influential than school suspension. The stage of the analyses at which school suspension was no longer a predictor of NVAB was after the entry of association with antisocial peers to the model. Further research is warranted to understand the possible mechanisms for links between suspension and problem behaviour, as well as differences in the impact of school suspension and other social responses on different types of problem behaviour.

School suspension was expected to impact on NVAB in several different ways. First, removal from the supervised school environment to a potentially unsupervised home environment (if parents are at work) or on the streets with other disengaged youth, may provide students with opportunities to engage in NVAB. Second, for students who do not want to attend school, being suspended may reinforce rather than deter future problem behaviour. Even though a direct link between suspension and NVAB was not found in this study, further longitudinal research is required that uses mediational analyses to examine the effects of suspension on other risk factors known to influence NVAB, in particular, by providing students opportunities to interact with antisocial peers and engage in problem behaviour, and reinforcement of such behaviour through the reward of not having to attend school. Such understanding may provide clues as to how to reduce any potential negative effects of suspension on behaviour or other risk factors.

Consistent with previous international studies, the findings presented in this paper showed that the risk and protective factors for NVAB are similar in the two states. Prior research on antisocial behaviour and violence has found comparable predictors in studies of countries in Europe, the United Kingdom, the U.S., and Japan, particularly in relation to family factors (see Junger-Tas, Terlouw, & Klein, 1994; Vazsonyi, Trejos-Castillo, & Huang, 2007). The current study advances the literature through its measurement of risk and protective factors across four domains (individual student, family, peer group, and school), the standardised methodologies, and international comparisons between the U.S. and Australia of predictors of NVAB.

The risk factors identified in this study as explaining unique portions of the variance in NVAB confirm those found to have strong relationships in previous studies (Catalano & Hawkins, 1996; Hawkins et al., 1998; Hemphill et al., 2006; Smart et al., 2003). The strongest predictor in both states was pre-existing NVAB reported in the first survey. This is consistent with many other studies showing that the best predictor of current behaviour is past behaviour, and shows the continuity across time of NVAB in particular (Ellickson & McGuigan, 2000; Farrington, 1998; Farrington & Loeber, 2000). Additional influential characteristics of the student were current alcohol use and current tobacco use. These factors have been related to NVAB in past research (Arnett, 1996; Pfefferbaum & Wood, 1994). Low commitment to school has been consistently related to NVAB (e.g., Ellickson & McGuigan, 2000; Smart et al., 2003), as it was in the present study.

Poor family management (e.g., lacking clear, consistent rules and monitoring of students) increased the likelihood of students engaging in NVAB 12 months later, confirming the important influence the family environment has on young people's behaviour (Smart et al., 2003). Associating with antisocial friends was also a risk factor for NVAB as in previous studies (e.g., Hawkins et al., 2000; Hemphill et al., 2009; Hemphill et al., 2006; Smart et al., 2003).

The findings shed some light on the interrelationship between influences through early and mid adolescence. In both states, a number of individual, peer group, family, and school risk factors showed reduced or statistically non-significant effects after multivariate adjustment for other factors, most notably levels of NVAB in the first survey. Given the important

influence of prior NVAB, the present findings support the need for prevention approaches to NVAB in childhood or pre-adolescence when behavioural pathways are developing.

This study shows that there were relatively small differences between states in the rates of NVAB, with Grade 7 Washington State male students engaging in higher rates of NVAB than Grade 7 Victorian male students at the first survey, but not at 12-month follow-up. Further, Grade 9 Washington State males engaged in higher rates of NVAB than their Grade 9 Victorian counterparts in the first survey; however, no differences were found 12 months later. State differences among females were not observed at either time point within each year level. There were notable state differences in the rates of risk factors including current alcohol and tobacco use (higher in Victoria) and cannabis use, interaction with antisocial peers, and school suspension (higher in Washington State).

### Limitations of the study

A limitation of this study was that the data was based solely on the adolescent's report of their NVAB, alcohol and drug use, family, peer and school risk factors so it is possible that some of the associations found are due to inflated correlations arising from using similar methods of measurement for both predictors and outcome variables. However, the use of self-report measures in studies of pre-adolescents and adolescents is considered a reliable source of data for behaviour problems such as antisocial behaviour (Huizinga & Elliott, 1986; Jolliffe et al., 2003; Rutter & Giller, 1983) and other factors such as interaction with antisocial friends which may not be visible to adults. To increase the accuracy of self-reports, the survey included items designed to detect students providing responses of questionable validity and these students were excluded from the analyses.

Second, the measure of NVAB contained four items that covered stealing, vehicle theft, selling illegal drugs and being drunk or high at school. This scale includes commonly measured indicators of NVAB, and these were the only items available in the current data set. Future studies attempting to replicate the findings of the current study should include more detailed measures of NVAB.

Other factors not measured in this study have also been found to be important in the development of NVAB. Several of the school risk and protective factors measured here were individually predictive; however, they did not uniquely contribute above the effects of the other variables in the multivariate model. These measures of school risk and protective factors may have missed aspects of the school environment that do not share common variance, such as school climate. Genetic and biological factors such as impulsivity may also have a role; studies that integrate psychosocial and biological factors in their examination of adolescent antisocial behaviour are crucial (Moffitt, 1993).

Given that participants may have already engaged in NVAB before the data for this study were collected, the causal ordering of risk and protective factors cannot be determined. However, prior NVAB was entered before the risk and protective factors, suggesting that they were explaining unique variance after accounting for prior behaviour.

## Implications of findings

The results of this study have important implications for practice and policy. The finding that many of the predictors of young people's NVAB are similar in Victoria and Washington State has implications for the targets of prevention in both states. A range of prevention and early intervention programs for adolescent antisocial behaviour that address the risk and protective factors studied here have been evaluated in North America (e.g., Center for the Study and Prevention of Violence, 2011), and may have applicability in Australia. Given the similarity of predictors of NVAB in the current study, North American programs that address common predictors and that have been tested and found to be effective in reducing adolescent NVAB may be appropriate in the Australian context, with modifications to fit with the Australian setting (e.g., cultural nuances), and vice versa.

The findings of this study can also inform modifiable targets for prevention and early intervention. The finding that earlier occurring NVAB was predictive of the same behaviour 12 months later underlines the importance of intervening early when signs of NVAB develop, with programs such as Participate and Learn (Jones & Offord, 1989). The influence of student characteristics such as alcohol and tobacco use emphasises the importance of supporting policies that are effective in reducing youth alcohol and tobacco use (Lubman, Hides, Yucel, & Toumbourou, 2007). Working with families who have a history of antisocial behaviour and with all families to strengthen family management approaches may assist them to model appropriate behaviours to their children and to adequately supervise and discipline their children and reduce the likelihood of young people engaging in NVAB (Center for the Study and Prevention of Violence, 2011). Interacting with other young people who engage in antisocial behaviour was a predictor in this study, underlining the importance of providing young people with age-appropriate supervised activities in which young people from a range of backgrounds participate, rather than grouping only troubled peers together (Dishion, 1990; Dishion, McCord, & Poulin, 1999). Low commitment to school raised the likelihood that students would engage in NVAB, emphasizing the importance of fostering attachment (caring about others and what others think), commitment (commitment to educational values), involvement (participating in school activities), and beliefs (accepting school rules and school authority as fair). Programs to improve teachers' instruction and classroom management skills have shown effects on delinquency, drug use, and other problems (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999; Kellam, Ling, Merisca, Hendricks Brown, & Ialongo, 2000). Overall, the results of this study support targeting multiple levels of risk and protective factors for effective prevention.

## Conclusions

The current methodologically rigorous, cross-national comparison study has shown that the modifiable influences on young people's NVAB are similar in Australia and the U.S. This has implications for identifying common targets for prevention as well as pointing to the potential effectiveness of evidence-based North American prevention and early intervention programs in the Australian context. Further, the risk and protective factors identified here are consistent with previous studies of the predictors of adolescent NVAB and property crime. An important finding in this study was that risk factors from multiple domains of influence (individual student, family, peer group, and school) affected subsequent NVAB.

These results highlight the importance of prevention and early intervention approaches that are multifaceted to address several risk factors concurrently as opposed to targeting a single risk factor.

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**Table 1**

Descriptive statistics for student-reported risk and protective factors in Victoria and Washington State at the first survey ( $n = 1,839$  Victoria,  $n = 1,838$  Washington State).

First survey risk and protective factors	Victoria Mean (SD)	Washington Mean (SD)
Individual risk factor		
Favourable peer attitudes to antisocial behaviour (e.g., "How wrong do you think it is for someone your age to take a weapon to school?"; No. of items = 5)	1.56 (0.56)*	1.44 (0.48)
Cronbach's alpha .79 - .83		
Family risk factors		
Poor family management (e.g., "The rules in my family are clear", reverse scored; No. of items = 9)	1.77 (0.51)*	1.69 (0.53)
Cronbach's alpha .77 - .81		
Family conflict (e.g., "People in my family often insult or yell at each other"; No. of items = 3)	2.25 (0.77)	2.27 (0.77)
Cronbach's alpha .77 - .81		
Family protective factor		
Opportunities for prosocial involvement (e.g., "My parents ask me what I think before most family decisions affecting me are made"; No. of items = 3)	3.09 (0.69)	3.07 (0.73)
Cronbach's alpha .71 - .76		
School risk factor		
Low commitment to school (e.g., "How often do you feel that the schoolwork you are assigned is meaningful and important?"; No. of items = 7)	2.23 (0.61)	2.22 (0.58)
Cronbach's alpha .69 - .74		
School protective factor		
Opportunities for prosocial involvement (e.g., "I have lots of chances to be part of class discussions or activities"; No. of items = 5)	2.98 (0.45)	3.04 (0.41)*
Cronbach's alpha .49 - .60		
	Victoria %	Washington %
Individual risk factors		
Current alcohol use	42.1***	18.1
Current tobacco use	13.6***	6.9
Current cannabis use	3.8	9.0***
Association with antisocial friends	40.1	46.3***
Social response risk factor		
School suspension	8.2	11.0**

Note. Risk and protective factors are generally scored on a 4-point scale.

\*  $p < .005$  (Bonferroni adjustment) state differences using (unadjusted) independent samples  $t$ -test

\*\*  $p < .01$  and

\*\*\*  $p < .001$  are the results of chi-square tests comparing dichotomous measures across the two states.

**Table 2**

Percentage (%) of the sample engaging in NVAB at the first survey and 12-month follow-up ( $n = 1,839$  Victoria,  $n = 1,838$  Washington State).

NVAB	Total sample		Grade 7 males		Grade 7 females		Grade 9 males		Grade 9 females	
	VIC	WA	VIC	WA	VIC	WA	VIC	WA	VIC	WA
First survey	14.3	17.0*	9.8	14.9*	8.6	10.9	18.9	24.6*	19.7	17.4
12-month follow-up	16.8	20.5**	13.2	17.4	13.5	17.7	20.5	24.8	19.7	21.6

Note. VIC = Victoria; WA = Washington State

\*  $p < .05$

\*\*  $p < .01$

$p$  values are results of chi-square tests comparing states within the total sample, gender, and grade level.

**Table 3**

Results of unadjusted logistic regression analyses predicting NVAB at 12-month follow-up from independent variables measured at first survey ( $n = 1,839$  Victoria, 1,838 Washington State).

	Victoria	Washington
	OR (95% CI)	OR (95% CI)
<i>Demographic characteristics</i>		
Female	1.0 (0.8-1.3)	0.9 (0.7-1.1)
Age	1.3 (1.1-1.5)**	1.2 (1.1-1.3)**
<i>Individual risk factors</i>		
NVAB	12.8 (9.3-17.6)***	11.3 (8.7-14.9)***
Current alcohol use	3.9 (2.9-5.2)***	6.2 (4.8-8.2)***
Current tobacco use	7.4 (5.6-9.7)***	5.7 (3.9-8.3)***
Current cannabis use	6.4 (3.8-10.8)***	9.8 (6.6-14.4)***
Favourable peer attitudes towards antisocial behaviour	3.9 (3.2-4.9)***	3.6 (2.8-4.6)***
<i>Family risk factors</i>		
Family conflict	1.9 (1.6-2.3)***	1.8 (1.5-2.2)***
Poor family management	4.4 (3.3-5.7)***	4.1 (3.1-5.5)***
<i>Family protective factors</i>		
Opportunities for prosocial involvement	0.5 (0.4-0.6)***	0.5 (0.4-0.6)***
<i>Peer risk factors</i>		
Association with antisocial friends	3.8 (2.9-5.0)***	3.2 (2.6-4.0)***
<i>School risk factors</i>		
Low commitment to school	3.3 (2.6-4.1)***	2.7 (2.2-3.3)***
<i>School protective factors</i>		
Opportunities for prosocial involvement	0.4 (0.3-0.6)***	0.5 (0.4-0.7)***
<i>Social responses</i>		
School suspension	4.9 (3.3-7.1)***	2.9 (2.2-3.7)***

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$

Table 4

Results of multivariate logistic regression analyses predicting NVAB at 12-month follow-up from risk and protective factors measured at the first survey ( $n = 3,677$ ).

	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)	Model 5 OR (95% CI)	Model 6 OR (95% CI)
<i>Social response</i>						
School suspension	3.7 (3.0-4.6)***	3.7 (2.9-4.7)***	1.5 (1.1-2.0)**	1.4 (1.1-1.9)*	1.3 (1.0-1.7)	1.3 (0.9-1.7)
% variance explained	3.2%					
<i>Demographic characteristics</i>						
Female		1.1 (0.9-1.3)	1.1 (0.9-1.3)	1.0 (0.9-1.3)	1.1 (0.9-1.3)	1.1 (0.9-1.4)
Age		1.2 (1.1-1.3)	1.0 (0.9-1.1)	0.9 (0.9-1.0)	1.0 (0.9-1.1)	0.9 (0.9-1.0)
% variance explained		4.0%				
<i>Individual risk factors</i>						
NVAB			5.8 (4.6-7.5)***	5.3 (4.1-6.8)***	5.0 (3.9-6.5)***	5.0 (3.9-6.5)***
Current alcohol use			1.8 (1.5-2.2)***	1.7 (1.4-2.1)***	1.7 (1.4-2.1)***	1.6 (1.3-2.0)***
Current tobacco use			1.7 (1.2-2.2)**	1.5 (1.1-2.1)**	1.4 (1.1-1.9)*	1.4 (1.0-1.9)*
Current cannabis use			1.6 (1.1-2.4)*	1.6 (1.0-2.3)*	1.5 (1.0-2.2)	1.4 (1.0-2.2)
Favourable peer attitudes towards antisocial behaviour			1.7 (1.4-2.1)***	1.3 (1.1-1.7)**	1.3 (1.1-1.6)**	1.2 (1.0-1.5)
% variance explained			21.7%			
<i>Family risk factors</i>						
Family conflict				1.2 (1.0-1.4)*	1.2 (1.0-1.4)	1.1 (1.0-1.4)
Poor family management				1.6 (1.2-2.0)***	1.5 (1.2-2.0)**	1.5 (1.2-1.9)**
<i>Family protective factor</i>						
Opportunities for prosocial involvement				0.9 (0.7-1.0)	0.9 (0.7-1.0)	0.9 (0.7-1.0)
% variance explained				23.0%		
<i>Peer risk factor</i>						
Association with antisocial friends					1.5 (1.3-1.9)***	1.5 (1.3-1.9)***
% variance explained					23.5%	
<i>School risk factor</i>						
Low commitment to school						1.3 (1.1-1.7)**



	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)	Model 5 OR (95% CI)	Model 6 OR (95% CI)
<i>School protective factor</i>						
<i>Opportunities for prosocial involvement</i>						1.2 (0.9-1.5)
<i>% variance explained</i>						23.7%

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .