

## INVITED ARTICLE

# Does the School Environment and School Engagement in Early High School Predict Trajectories of Anti-Social Behaviour? A National Longitudinal Study of Australian Youth From 12 to 19 years

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## ABSTRACT

**Background:** Schools are widely considered important agents of social control for young people. Consequently, school engagement, disengagement and the school environment are key to understanding behavioural outcomes during adolescence. This study addresses an empirical gap in longitudinal research by examining new types of school engagement, as well as school-level environmental factors.

**Aims:** To understand the role that school engagement and the school environment play in shaping trajectories of antisocial behaviour.

**Methods:** Using longitudinal survey of Australian children (LSAC), this study employed trajectory analysis to identify trajectories of ASB over 4 waves. We tested the influence that early high school engagement and the school environment had on ASB trajectories through a series of multinomial logistic regressions.

**Results:** Of the 2983 Australian school students included in the study, three trajectory groups were identified: no ASB ( $n = 1599$ ), low-level ASB ( $n = 1158$ ) and moderate-level ASB ( $n = 88$ ). The influence of truancy, suspension/expulsion and school avoidance were all particularly strong, and student–teacher relationships were found to both directly and indirectly influence levels of ASB.

**Conclusions:** This longitudinal study provides a comprehensive overview of trajectories of antisocial behaviour during adolescence and how they are influenced by experiences at school. It confirms the strong influence of behavioural disengagement and offers new insights into the role of affective school engagement and the school environment.

## 1 | Introduction

It is widely accepted that antisocial behavioural patterns (ASB) develop and evolve within individuals throughout time, with different risk and protective factors present at different life stages (D. P. Farrington et al. 2002; Moffitt 1993). Understanding the scope of these risk and protective factors has long been identified as a priority for developmental criminology

(Piquero 2023; D. P. Farrington et al. 2016). Trajectory modelling is typically used to distinguish between low- and high-level offending behaviour groups over time (D. P. Farrington et al. 2023b). Despite the wide adoption of trajectory-modelling, there has been limited trajectory research on risk and protective factors in school. Offending behaviour has indeed been found to be shaped by school experiences, including problems with completion and future employment (Basto-Pereira and

Farrington 2022; D. P. Farrington et al. 1986; D. Farrington et al. 2023a; Liu 2013; X. Wang et al. 2005), problematic peers (Gremmen et al. 2018; D. Farrington et al. 2023a; D. P. Farrington and Welsh 2006) and perpetration or victimisation of school bullying (Tfofi and Farrington 2008; D. P. Farrington 1993; Baldry and Farrington 2000). However, neither school engagement nor the school environment has been a focus in trajectory research despite preliminary evidence to suggest that they are influential (Allen, Vella-Brodrick, and Waters 2016; Bonny et al. 2000; D. P. Farrington and Welsh 2006; du Plessis-Schneider 2020; L. J. Graham et al. 2022; Novak 2019; Varela et al. 2021; Kearney et al. 2019; Klein, Sosu, and Lillywhite 2022; Holmes et al. 2018; Z. Wang et al. 2012; Cadoret, Cain, and Crowe 1983; Joo and Lee 2020; Reaves et al. 2018). This study extends and makes methodological improvements to the extant longitudinal research by examining how school engagement and the broader school environment influence trajectories of antisocial behaviour from 12 to 19 years of age.

## 2 | The Development of Antisocial Behaviour

The relationship between age and crime has been documented extensively in criminological literature, most notably through the decades of research led by David Farrington and his collaborators. Farrington's research has revealed a normative pattern of offending behaviour—an 'age-crime curve'—with the highest prevalence observed in adolescent age groups (D. P. Farrington 1986, 2021; D. P. Farrington et al. 2023b). Terrie Moffitt's (1993) developmental taxonomy seeks to explain this age-crime curve and identifies two overarching trajectories of offending behaviour: life-course-persistent (LCP) and adolescent-limited (AL) offenders. LCP offending emerges from the inheritance or acquisition of neuropsychological impairment at an early age, which subsequently drives ongoing life-long antisocial behaviour (Moffitt 1993; McGee and Moffitt 2018). AL offending is considered developmentally normative, materialising during the adolescent stage of life in response to a temporary 'maturity gap' between social and biological age. Moffitt (2006, 2018) also acknowledges that some people defy the age-crime curve and avoid crime throughout their lifetime (abstainers), and that certain social experiences can result in persistent offending behaviours amongst individuals who would ordinarily desist post-adolescence (adolescent-onset-persistent offenders).

## 3 | Schools and Social Control

Developmental criminology acknowledges that the age-crime relationship is shaped by a range of external social factors. For example, recent research from the Cambridge Study in Delinquent Development (CSDD) demonstrates that schools are among the main social contexts within which offending behaviours develop and evolve (D. P. Farrington 2021; D. P. Farrington and Welsh 2006). Moreover, schools influence behavioural outcomes because they serve as 'turning points': powerful life events which create opportunities and incentives for prosocial behaviours (such as positive peer networks and psychological rewards of educational success) and minimise

'routine activities' by keeping adolescents occupied during the stage of life within which they are most developmentally susceptible to misbehaviour (Sampson and Laub 1990; Hirschi 1969; Liu 2013). Thus, challenges at school, such as low school engagement or adversity within the school environment, can influence behavioural development because they limit the availability and potency of these important turning points (Allen, Vella-Brodrick, and Waters 2016; Bonny et al. 2000; D. P. Farrington and Welsh 2006; du Plessis-Schneider 2020; Graham et al. 2020, 2022; Varela et al. 2021; Kearney et al. 2019; Klein, Sosu, and Lillywhite 2022; Holmes et al. 2018; Z. Wang et al. 2012; Cadoret, Cain, and Crowe 1983; Joo and Lee 2020; Reaves et al. 2018; Gerlinger et al. 2021; Gerth 2020; Hemphill et al. 2012, 2017).

### 3.1 | School Engagement

There are three core types of school engagement: behavioural (positive conduct and active participation in school activities), affective (liking of and belonging at school) and cognitive (investment in learning) (Fredricks, Blumenfeld, and Paris 2004). Each of these foster the development of prosocial bonds during childhood and adolescence and therefore protect against antisocial behaviour (Wolf and Kupchik 2016; Welsh and Little 2018; Klein, Sosu, and Lillywhite 2022; Allen, Vella-Brodrick, and Waters 2016).

### 3.2 | School Disengagement

School disengagement refers to the absence of these characteristics. Both behavioural and affective disengagement have been seen to erode important social bonds and thus contribute to increased risk of antisocial behaviour (Graham et al. 2015, 2020; Sutherland 2011; Finn and Zimmer 2012; Martins et al. 2022; Allen, Vella-Brodrick, and Waters 2016; Bonny et al. 2000; Monahan et al. 2014; Varela et al. 2021). In the case of behavioural disengagement (i.e., a physical absence from the school environment), the additional risk is that it physically removes young people from prosocial spaces, creating idle time in an unsupervised environment that can readily be filled with antisocial behaviour (Klein, Sosu, and Lillywhite 2022; Daraganova, Mullan, and Edwards 2014; X. Wang et al. 2005; Allen, Vella-Brodrick, and Waters 2016; Sampson and Laub 1990, 1993; Martins et al. 2022; Angus et al. 2010; Wolf and Kupchik 2016; Welsh and Little 2018).

### 3.3 | School Environments

Environments characterised by chaos and/or conflict can lead to emotional dysregulation, weaken inhibitions, and interrupt psychosocial adjustment (D. P. Farrington and Welsh 2006; Holmes et al. 2018; Z. Wang et al. 2012; Cadoret, Cain, and Crowe 1983; Joo and Lee 2020). Hence, such environments have been linked to maladaptive behavioural outcomes, including those in schools (Ly et al. 2021).

## 4 | Current Study

The present study draws on the longitudinal survey of Australian children (LSAC) to explore the role of both school engagement and the school environment on trajectories of antisocial behaviour (Nagin 1999). To our knowledge, it is the first national study to examine these school factors using a group-based trajectory modelling (GBTM) methodology.

## 5 | Method

### 5.1 | Sample

This study uses data from Waves 5–8 of the longitudinal survey of Australian children (LSAC) (K Cohort), which captures a nationally representative sample of 4983 Australian children from ages 12 to 19 (data collected biennially from 2012 to 2018). Both teacher-reported data (collected with a paper questionnaire) and child-reported data (collected through face-to-face interviews and self-completed surveys) are included.

We used sample weights for Wave 5 data which were designed to account for response attrition. A further set of weights was used to adjust the sample with demographic benchmarks within the population (Cusack and Defina 2013). The current study also made further adjustments to account for nonresponse of certain key variables (e.g., antisocial behaviour). The final analytic sample was  $n = 2845$ .

### 5.2 | Measures

The dependent variable for the analysis was the level of ASB (none (abstainer), low (adolescent-limited) and moderate (life-course-persistent)). It was based on the self-report delinquency scale (SRDS) (Moffitt and Silva 1988).<sup>1</sup> Each item of the SRDS was first turned into a binary indicator of at least one instance of that activity in the past 12 months. An ASB frequency score was then created for each survey wave, by taking the mean score across all SRDS items each year.<sup>2</sup>

Six demographic variables were included: diagnosis of a condition or disability that has persisted for 6+ months (excluding mental illness), diagnosis of autism, Asperger's or another condition on the autism spectrum, First Nations status (including Aboriginal, Torres Strait Islander, or both), sex at birth (male or female), SEIFA decile of socioeconomic advantage/disadvantage (ABS 2021), and family socioeconomic position (as derived through a range of social and economic variables (Baker, Siphthorp, and Edwards 2017)).

A further ten school-related variables were analysed<sup>3</sup>:

- Two indicators of behavioural disengagement, represented as at least one instance of suspensions/expulsion or truancy in the past 12 months.
- Behavioural engagement, represented as low levels of absenteeism.<sup>4</sup>

- An affective disengagement measure and school avoidance, as adapted from the school liking and avoidance scale (SLAS) and the school sentiment inventory (Ladd and Price 1987).
- Two measures of affective engagement, including levels of school adjustment (positive affect/general satisfaction and intrinsic motivation) and school membership (acceptance, inclusion and recognition amongst both teachers and peers based on the Psychological Sense of School Membership (PSSM)) (Goodenow 1993).
- Four school-level environmental measures, including school type (government, Catholic, independent/private), student-teacher relationships (based on the people in my life teacher affiliation scale (Ridenour, Greenberg, and Cook 2006)), teacher self-assessments of their capacity to manage behavioural and/or learning issues within the classroom, and teacher assessments of school cohort's behaviour (positive (helpful/cooperative/friendly) or negative (disruptive/disobedient)).

### 5.3 | Analyses

#### 5.3.1 | Group-Based Trajectory Modelling

GBTM is particularly appropriate for taxonomical research because it identifies unique clusters of people on similar developmental trajectories without making any generalised, whole-of-population assumptions (Nagin 1999, 2014; Evans, Simons, and Simons 2016). Waves 5–8 of the LSAC-K dataset were included in the trajectory model, reflecting antisocial behaviour from ages 12–19. Up to four trajectory groups were modelled to the data using different combinations of the following polynomial functions (trajectory curves): constant (intercept), linear, quadratic and cubic (Nagin 2014) (summarised at Supporting Information S1: Appendix 1). Criminal careers research has indeed identified more than four trajectory groups (see: Jolliffe et al. 2017; D. P. Farrington 2021; Jennings and Reingle 2012; Piquero 2023); however, the current study has a constrained age bracket (12–19), which means that we can expect to observe less variation in behavioural trajectories. For example, important distinctions have been made between different patterns of continuous offending behaviours (e.g., very low rate chronic, high rate chronic) (see: Jennings and Reingle 2012). To properly differentiate between these groups, analysis would need to start at an earlier age and continue well into adulthood. Hence, a smaller number of possible trajectory groups is more realistic in this case. Respondents with missing responses for ASB on at least three occasions over the four survey waves were excluded from the analytic sample, because otherwise there would not be enough data points to model their behavioural trajectories. The final model was selected based on five criteria of satisfactory fit:

1. The difference in two Bayesian information criteria (2 ( $\Delta$ BIC) scores, where a higher 2( $\Delta$ BIC) score presents evidence in favour of the alternative model (D'Unger et al. 1998; Jones, Nagin, and Roeder 2001).
2. Low individual BIC scores (Fabozzi et al. 2014).
3. High average posterior probabilities ( $> 0.7$ ), reflecting higher likelihood that the parameter estimate (i.e.,

assigned group) can be observed in the population<sup>5</sup> (Nagin 2014; Van Hazebroek et al. 2019).

4. High odds of correct classification ( $\geq 5$ ), indicating that the model's group assignment is considered more accurate than random assignment (Van Hazebroek et al. 2019).
5. Lower entropy, indicating lower levels of event uncertainty (Eshima 2020).

### 5.3.2 | Regression Model

Nested multinomial logistic regression models were run to determine the relative risk of the ASB level across the three sets of independent variables: (1) demographic factors, (2) school environment factors and (3) school engagement factors (described above in *Measures*, with summary statistics provided at Table 1). Each set of covariates satisfied multicollinearity checks (VIF score < 10) (Vittinghoff 2012). All possible combinations of base and comparison outcomes were modelled to examine the relative risk of developing one pattern of ASB compared to another (Acock 2018). The independence of irrelevant alternatives assumption (IIA) was tested for each individual model to check whether an ordered choice model was a more suitable form of analysis (Hausman and McFadden 1984; StataCorp 2013). The Suest-based Hausman test did not reveal any violations of this IIA principle ( $p > 0.05$ ). The association with the ASB level was measured at the  $p < 0.05$  level.

### 5.3.3 | Interaction Terms

Wald tests were used to test for school engagement, disengagement and environment interactions with ASB (i.e., taking into consideration outcomes of both the main variables and their interaction). The alpha level was adjusted using the Bonferroni correction,<sup>6</sup> which is a more conservative threshold to mitigate the risk of false positives associated with interaction terms (Garofalo et al. 2022; Haynes 2013). To ensure robustness, interactions where cell sizes were less than five were not tested (Yates, Moore, and McCabe 1999).

## 6 | Results

Three ASB categories emerged (detailed in *Trajectory Modelling* below). Most respondents did not report any offending throughout adolescence (i.e., abstainers) (56.2%), whereas 40.7% reported low (adolescent-limited) levels. The group with the highest levels of ASB (life-course-persistent) had an especially small sample size ( $n = 88$ ). Although gender and socioeconomic status were evenly distributed, the sample was otherwise relatively homogenous (detailed in Table 1).

### 6.1 | Trajectory Modelling

Based on the criteria outlined in *Methods* above, the best-fit model was the three-trajectory model with one quadratic and

**TABLE 1** | Descriptive statistics (weighted)<sup>a</sup>.

	N	Mean
Social advantage/ disadvantage decile	2843	5.8 (SD: 0.13)
Parental socioeconomic status	2833	0.12 (SD: 0.02)
	N	Percent (%)
<b>Antisocial behaviour</b>		
Abstainer	1599	56.2
Adolescent-limited	1158	40.7
Life-course-persistent	88	3.1
Total	<b>2845</b>	<b>100.0</b>
<b>Disability</b>		
No diagnosis	2276	96.2
Diagnosis	108	3.8
Total	<b>2834</b>	<b>100.0</b>
<b>ADHD</b>		
No diagnosis	2752	97.1
Diagnosis	82	2.9
Total	<b>2834</b>	<b>100.0</b>
<b>Autism/Asperger's</b>		
No diagnosis	2769	97.7
Diagnosis	65	2.3
Total	<b>2834</b>	<b>100.0</b>
<b>First nations status</b>		
Not first nations	2785	97.9
First nations	60	2.1
Total	<b>2845</b>	<b>100.0</b>
<b>Sex at birth</b>		
Female	1428	50.2
Male	1417	49.8
Total	<b>2845</b>	<b>100.0</b>
<b>School type</b>		
Government	1474	52.2
Catholic	700	24.8
Independent/Private	649	23.0
Total	<b>2823</b>	<b>100.0</b>
<b>Student-teacher relationships</b>		
Strong	1784	65.7
Weak	931	34.3
Total	<b>2715</b>	<b>100.0</b>
<b>Classroom management</b>		
Not competent	87	4.0
Competent	2087	96.0
Total	<b>2174</b>	<b>100.0</b>

(Continues)

**TABLE 1** | (Continued)

	<b>N</b>	<b>Percent (%)</b>
Truancy (past 12 months)		
No instances	2520	89.4
At least one instance	299	10.6
<b>Total</b>	<b>2819</b>	<b>100.0</b>
Suspension/Expulsion (past 12 months)		
No instances	2659	94.3
At least one instance	161	5.7
<b>Total</b>	<b>2820</b>	<b>100.0</b>
Absenteeism		
Low levels	1549	54.9
Moderate levels	841	29.8
High levels	432	15.3
<b>Total</b>	<b>2821</b>	<b>100.0</b>
School adjustment		
Low levels	54	2.0
Moderate levels	1415	52.1
High levels	1246	45.9
<b>Total</b>	<b>2715</b>	<b>100.0</b>
School avoidance		
Low levels	832	29.5
Moderate levels	1939	68.7
High levels	54	1.9
<b>Total</b>	<b>2822</b>	<b>100.0</b>
Sense of school membership <sup>b</sup>		
Low score	54	2.0
High score	2658	97.9
<b>Total</b>	<b>2715</b>	<b>100.0</b>

<sup>a</sup>NB: Sample size may differ across the variables due to missing values and survey attrition.

<sup>b</sup>Noting that due to inadequate cell sizes, school membership was binarised into high/low, whereas other measures of affective engagement contained high/medium/low categories.

two cubic trajectories (see Figure 1, and Supporting Information S1: Appendix 1 for a more detailed discussion of model selection). This established three ASB categories which, as mentioned above, broadly reflect (respectively) the life-course-persistent (LCP), adolescent limited (AL) and abstainer cohorts observed in Moffitt’s research (Moffitt 1993, 2018).

## 6.2 | Regression Results

This section reports on the multinomial logistic regressions, which modelled factors at age 12–13 (Wave 5) against ASB trajectories. All models were statistically significant at the  $p < 0.05$  level, indicating that each set of covariates explained variation in ASB trajectories. Table 2 presents the regression results of the fully-fitted model (model 3—demographic, school environment, school engagement and

disengagement), and Supporting Information S1: Appendix 2 presents the regression outputs for models 1 (demographic) and 2 (demographic and school environment).

### 6.2.1 | Demographic Characteristics

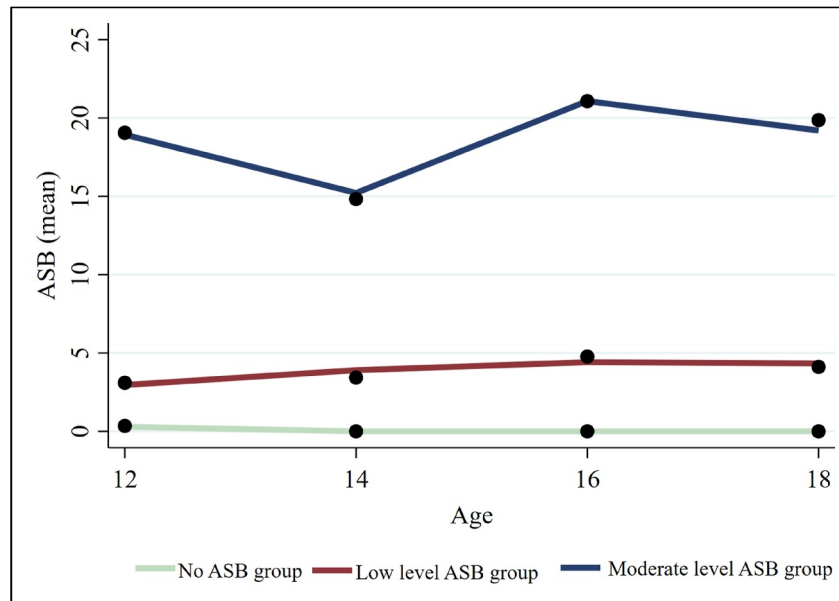
Three demographic factors remained statistically significant across all three models: being male (compared to female), having an ADHD diagnosis and parental SES. The strength of these factors gradually decreased with the addition of school engagement and school environment variables. However, in model 3, (i) males were still twice as likely as females to be in the AL group and over two and a half times as likely to be in the LCP ASB group (compared to abstainers), (ii) those that had an ADHD diagnosis were still almost twice as likely to be in the AL ASB group (compared to the abstainer group) and (iii) a one-unit increase in parental SES was associated with a lower likelihood of LCP ASB compared to both abstainers and AL ASB (decreased likelihood of 28.0% and 25.0%, respectively). First Nations status and parental SES were both initially associated with AL ASB (compared to abstainers) but these relationships were no longer significant when school engagement/disengagement and the school environment were included. Neither socioeconomic advantage/disadvantage of the area nor disability status (including autism and Asperger’s) were associated with ASB at a statistically significant level.

### 6.2.2 | School-Level Factors

Student–teacher relationships was the only statistically significant school environment factor that was directly associated with ASB. In model 2, students were 1.66 times more likely to be in the AL ASB (vs. no-ASB) group when they had weak, as opposed to strong, student–teacher relationships, and over two times as likely to be in the LCP ASB (vs. abstainers). When school engagement was introduced, student–teacher relationships were no longer associated with LCP ASB (vs. abstainers) and the relative risk of AL ASB (vs. abstaining) had decreased by 34.0%.

### 6.2.3 | School Engagement and Disengagement

Behavioural development was influenced by the extent of engagement and disengagement with school. The most influential forms of school disengagement were truancy and suspension/expulsion. Students were approximately 1.8 times more likely to be in the AL ASB group (compared to abstaining) if they had experienced at least one instance of truancy or suspension/expulsion in the past 12 months. This relationship was more pronounced when comparing LCP ASB to abstainers, where a suspension/expulsion increased the likelihood by three and a half times, and truancy increased the likelihood by almost five times. Conversely, students were less likely to develop antisocial behaviour if they were behaviourally or affectively engaged. For example, students were less likely to develop antisocial behaviour if they had low levels of school absence, or high levels of school adjustment. Neither school avoidance nor school membership was related to ASB outcomes.



**FIGURE 1** | Trajectories of antisocial behaviour by group. Reflects the average frequency scores for ASB within each identified group throughout ages 12–19.

#### 6.2.4 | Interactions Between School Environment and Disengagement

With respect to the indirect role of the school environment, nine of the 24 interactions tested were associated with the ASB level at a statistically significant level ( $p < 0.00278$ ) and a further five were excluded because they did not meet the recommended threshold of cell counts of at least five (Yates, Moore, and McCabe 1999; see: Supporting Information S1: Appendix 3). In total, four statistically significant interactions were identified. The estimated probability of abstaining was higher when behaviourally disengaged students (i.e., truants, high-level absentees and suspended/expelled students) had strong relationships with their teachers. Conversely, behaviourally disengaged students with weak relationships with their teachers had a higher estimated probability of developing low-level ASB patterns (the relationship was less pronounced in the case of moderate-level ASB). This indicates that strong student–teacher relationships can mitigate the consequences of being physically absent from school, especially for students on low-level ASB trajectories (depicted in Figure 2). Interestingly, this moderation was less pronounced in the case of truancy. There was evidence to suggest that school types may play a moderating role in some cases; however, the main effects for school types were not significant, so this is a tenuous interactive relationship.

## 7 | Discussion

The extant literature shows that experiences at school can shape offending behaviour throughout the life course by altering one’s social attachments, commitments and attitudes (Basto-Pereira and Farrington 2022; D. P. Farrington et al. 1986; D. Farrington et al. 2023a; Liu 2013; Gremmen et al. 2018; D. P. Farrington and Welsh 2006; Tfofi and Farrington 2008; D. P. Farrington 1993; Baldry and Farrington 2000). By applying Moffitt’s taxonomical theory and using leading trajectory methodologies,

the current study demonstrates that trajectories of behaviour can also be shaped by school engagement, disengagement and the school environment. Specifically, we find that both behavioural disengagement (suspension/expulsion and truancy) and behavioural engagement (school attendance (i.e., low levels of absenteeism)), high levels of affective engagement with school and poor student–teacher relationships with students at ages 12–13 predict patterns of trajectories consistent with adolescent limited and life-course-persistent offending throughout high school. This study also finds that positive student–teacher relationships can also play a protective role for students who are behaviourally disengaged. These findings highlight that tactics which improve school attendance, build constructive student–teacher relationships (including through improvements to teacher wellbeing) and prevent truancy are of utmost importance to criminological policies and practices. The findings relating to suspension and expulsion also encourage practitioners to explore more constructive alternatives to exclusionary discipline, which aim to build prosocial bonds at school rather than remove young people from their schooling environments (see: Sutherland 2011; L. J. Graham et al. 2015; Wolf and Kupchik 2016; Gerlinger et al. 2021).

#### 7.1 | Behavioural Engagement and Disengagement

First, consistent with the extant literature (Wolf and Kupchik 2016; Welsh and Little 2018; Gerlinger et al. 2021; Nolte-meyer, Ward, and Mcloughlin 2015; Novak 2019; Jacobsen 2019; Skiba, Arredondo, and Williams 2014), the findings verify that when young people do not attend school and/or class (i.e., skip school, or experience suspension or expulsions) they are at a heightened risk of ASB, irrespective of the distinct developmental trajectory. To further reinforce this point, students with better behavioural engagement (i.e., lower levels of absenteeism) had more favourable ASB outcomes. Hence, the findings

**TABLE 2** | Regression results from fully fitted model<sup>a</sup>.

	Low v none	Moderate v none	Moderate v low
ASB group			
Disability diagnosis	1.12	1.84	1.64
Confidence intervals	0.71–1.76	0.69–4.86	0.63–4.24
ADHD diagnosis	<b>1.87*</b>	2.68	1.44
Confidence intervals	1.07–3.25	0.88–8.16	0.50–4.11
Autism/Asperger’s diagnosis	1.36	0.68	0.50
Confidence intervals	0.76–2.45	0.14–3.34	0.11–2.34
First nations	1.62	0.76	0.47
Confidence intervals	0.89–2.94	0.16–3.64	0.10–2.14
Male	<b>2.04**</b>	<b>2.68**</b>	1.31
Confidence intervals	1.72–2.42	1.61–4.47	0.79–2.19
SEIFA	1.01	0.97	0.96
Confidence intervals	0.98–1.04	0.89–1.06	0.88–1.05
Parental SES	0.97	<b>0.72**</b>	<b>0.75*</b>
Confidence intervals	0.88–1.07	0.55–0.95	0.57–0.97
School type			
Catholic school	1.07	0.97	0.90
Confidence intervals	0.87–1.31	0.52–1.78	0.49–1.66
Independent/Private school	1.00	0.91	0.91
Confidence intervals	0.81–1.23	0.47–1.76	0.47–1.76
Weak student–teacher relations	<b>1.32*</b>	1.40	1.07
Confidence intervals	1.04–1.68	0.74–2.69	0.56–2.02
Classroom managed competently	1.17	0.66	0.57
Confidence intervals	0.72–1.90	0.19–2.31	0.16–2.00
Prosocial behaviour within school cohort			
Moderate levels	0.61	0.45	0.73
Confidence intervals	0.31–1.18	0.11–1.87	0.18–2.95
High levels	0.78	0.65	0.84
Confidence intervals	0.40–1.51	0.16–2.74	0.21–3.39
At least one instance of suspension/expulsion	<b>1.84**</b>	<b>3.60**</b>	1.96
Confidence intervals	1.36–2.45	1.73–7.49	0.99–3.87
At least one instance of truancy	<b>1.82**</b>	<b>4.75**</b>	<b>2.60**</b>
Confidence intervals	1.19–2.83	2.66–8.48	1.49–4.55
Absenteeism			
Moderate levels	0.79	<b>0.44**</b>	0.55
Confidence intervals	0.61–1.03	0.22–0.86	0.29–1.07
Low levels	<b>0.65**</b>	<b>0.38**</b>	0.59
Confidence intervals	0.51–0.84	0.21–0.70	0.32–1.06
School adjustment			
Moderate levels	1.01	0.42	0.42
Confidence intervals	0.52–1.98	0.13–1.35	0.13–1.24
High levels	0.67	<b>0.25*</b>	0.37
Confidence intervals	0.34–1.33	0.07–0.87	0.11–1.21

(Continues)

TABLE 2 | (Continued)

	Low v none	Moderate v none	Moderate v low
School avoidance			
Moderate levels	1.10	0.94	0.85
Confidence intervals	0.91–1.33	0.53–1.66	0.48–1.51
High levels	1.74	2.73	1.57
Confidence intervals	0.89–3.37	0.72–10.33	0.44–5.63
High PSSM	0.78	2.31	2.98
Confidence intervals	0.41–1.47	0.50–10.78	0.68–13.03

<sup>a</sup>In this table: ‘Diagnosis of a disability’, ‘ADHD’ and ‘Autism/Asperger’s’ is in comparison to ‘No Diagnosis’, ‘First Nations’ is compared to ‘non-First Nations’, ‘Male’ is compared to ‘Female’, ‘Catholic’ and ‘Independent/Private’ school type is compared to ‘Government’ school type, ‘Weak student–teacher relations’ is compared to ‘Strong student–teacher relations’, ‘Classroom managed competently’ is compared to ‘Classroom not managed competently’, ‘High/Moderate levels of prosocial behaviour within the school cohort’ is compared to ‘Low levels of prosocial behaviour within the school cohort’, ‘At least one instance of suspension/expulsion’/‘truancy’ is compared to ‘No instance’, ‘Moderate/Low levels of absenteeism’ is compared to ‘High levels of absenteeism’, ‘High/Moderate levels of school adjustment’/‘school avoidance’ is compared to ‘Low levels of school adjustment’/‘school avoidance’, and ‘High PSSM’ is compared to ‘Low PSSM’. SEIFA and Parental SES are continuous values representing likelihood of ASB alongside a one-unit increase in SEIFA score/Parental SES.

\**p* < 0.05, \*\**p* < 0.02.

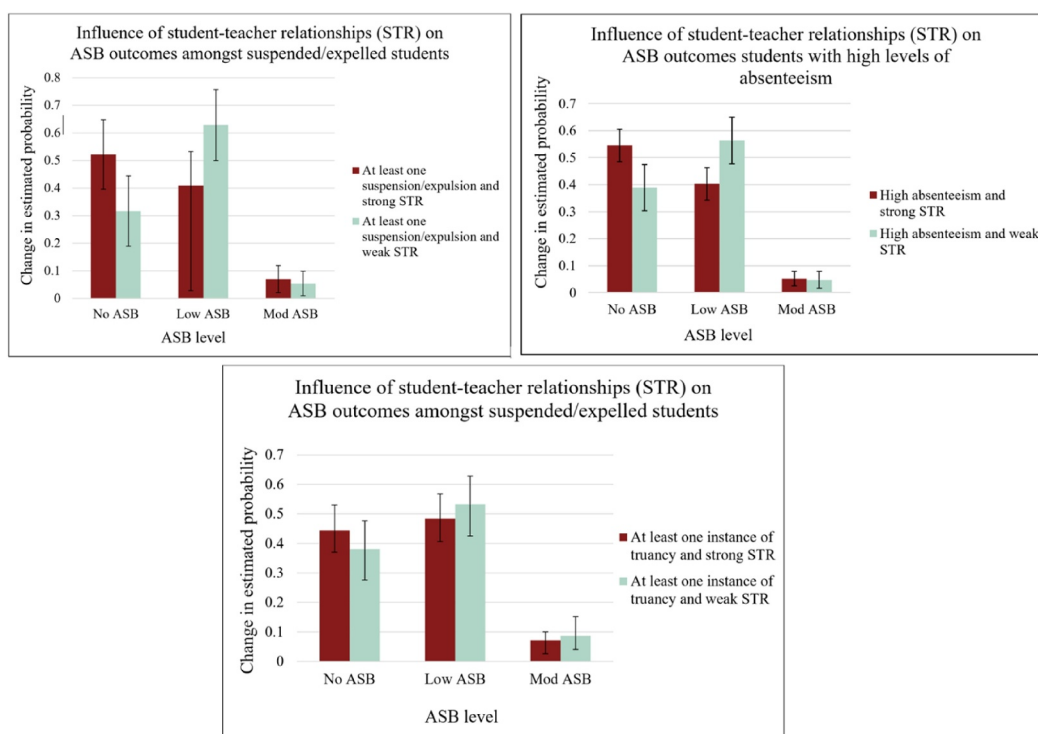


FIGURE 2 | Influence of student–teacher relationships (STR) on behaviourally disengaged students. To improve readability, the main behavioural disengagement variables (i.e., without their interactions with STR) are not displayed in these graphs.

from the current study support the notion that schools serve as important turning points, and thus poor school outcomes (educational or otherwise) can have long-term consequences for behaviour (see also: Basto-Pereira and Farrington 2022; D. P. Farrington et al. 1986).

Another key finding was that truancy had the strongest influence on ASB, and truanting students were less influenced by the moderating role of student–teacher relationships. Suspended, expelled or absent students may remain under school or parental supervision during the disciplinary period; however, truanting is covert and thus these individuals have maximum opportunity to socialise with potentially antisocial peers and

participate in crime (Wilson and Braithwaite 1977; Gerth 2020; Filkin and Willmott 2022). This reflects the importance of social supervision, particularly during adolescence, and also supports findings made through the Cambridge study in delinquent development that “continuing to associate with delinquent friends may be a key factor in determining whether juvenile delinquents persist in offending as young adults or desist” (D. P. Farrington and Welsh 2006, 81).

These findings also offer new insights into the development of ASB trajectories. For LCP individuals, behavioural disengagement may feed the negative cycle that drives continuous anti-social behaviour throughout their life course (Moffitt 1993). For



those on an AL pathway, behavioural disengagement may increase opportunities for crime through unsupervised interaction with those with LCP patterns (Moffitt 1993). Furthermore, truancy was the only school-related measure that explained differences between AL and LCP trajectories. This provides evidence to suggest that truancy may operate as a snare, contributing to the continuity of offending within individuals who may otherwise offend on AL pathways (McGee et al. 2015).

## 7.2 | Affective Engagement

A key finding from the current study is that school adjustment was associated with a considerably lower likelihood (75.0%) of developing an ASB trajectory consistent with LCP. This is a novel finding that has not been previously documented, and while the current study needs replication and extension by long-term studies into adulthood, our findings suggest that poor affective school engagement uniquely shapes individuals on life-course-persistent pathways. Thus, for LCP individuals, physical presence at school is not enough. Young people exhibiting signs consistent with life-course-persistent offending would benefit from early interventions fostering affective engagement.

## 7.3 | Student–Teacher Relations

Beyond within-student factors, one of the most salient findings was the multi-faceted role of student–teacher relationships. First, weak student–teacher relationships were associated with an increased relative risk of AL ASB, even after taking school engagement and disengagement into account. Theoretically, this may be because weak student–teacher relationships either incite a response to the maturity gap (for those exhibiting AL ASB patterns) or otherwise shape LCP pathways by feeding a lifelong cycle of self-perpetuating negative behaviours and attitudes. These trajectory-based findings offer new insights into the way that student–teacher relationships shape patterns of ASB over time. Conversely, the results of the interaction analysis show that positive relationships with teachers were protective for behaviourally disengaged students, that is, these students had lower likelihood of ASB when they reported strong teacher relationships. This likely reflects the positive influence of prosocial relationships and attachments (Hirschi 1969), exemplifying the role of the school as a crucial developmental turning point.

## 7.4 | Study Strengths and Limitations

School engagement and the school environment are important concepts which are often missed from school-based criminological research, particularly for those examining trajectories of ASB techniques. The strength of this study is that it addresses these important areas using a nationally representative sample of adolescents. However, there are some limitations. First, the scope of our longitudinal study is limited, covering only the ages from 12 to 19. To validate the applicability to Moffitt's theory, and to developmental criminology more broadly, future studies on this topic should begin in early childhood and extend into

adulthood. Second, this study did not include students who were entirely disengaged from school by ages 12–13 years. Although this would be a small group—with 3.1–3.3 per 10,000 10–17 year olds in youth detention during the LSAC's wave five data collection period (AIHW 2014)—such individuals are amongst the most at-risk of leading long-term antisocial pathways, and are thus of particular interest to this study. Moreover, student–teacher relationship data were dependent on teachers completing a survey and therefore some may not have done so due to fragmented student relationships or intense work pressures. Future research should also endeavour to gather the perspectives and experiences of these missing cohorts.

## 8 | Conclusion

Using a taxonomical approach to offending behaviour, this study identified several school-related developmental risk and protective factors. Behavioural engagement was significantly influential for both AL and LCP groups, and there was evidence to suggest that this relationship could be mitigated through strong student–teacher relationships. LCP individuals were also directly influenced by affective disengagement from school, and AL individuals were directly influenced by weak relationships with their teachers. These findings confirm that schools serve an important role in creating turning points for young people during adolescence. However, the distinct developmental pathways presented in this study also extend our understanding of the way that school life shapes offending behaviour and creates new opportunities for early intervention policies and practices.

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### Conflicts of Interest

The authors declare no conflicts of interest.

### Data Availability Statement

The data that support the findings of this study are openly available in Australian Data Archive at <https://dataverse.ada.edu.au/dataset.xhtml?persistentId=doi:10.26193/BAA3N6>, reference number <https://doi.org/10.26193/BAA3N6>.

### Endnotes

<sup>1</sup> The test–retest reliability of the SRDS showed high internal consistency (Pearson correlation = 0.85), and individual items in the scale were subject to a series of content validity checks by researchers. External validity checks also suggested that the scale had adequate convergent validity. Researchers concluded that “both reliability and validity were found to be sufficient to recommend the instrument for research purposes” (Moffitt and Silva 1988). In this study, items on truancy and suspension/expulsion were excluded as they were being analysed separately.

<sup>2</sup> The LSAC added 8 new items to the ASB scale in Wave 8, which were factored into the average scores. See: Study questionnaires | Growing Up in Australia. Items relating to truancy, suspension and expulsion were removed as they are separately analysed.

<sup>3</sup> All continuous variables were converted into categorical variables (e.g., yes/no indicator, high/medium/low) for ease of interpretation in logistic regression modelling.

<sup>4</sup>This paper's discussion of interaction effects also uses high levels of absenteeism as a measure of behavioural disengagement.

<sup>5</sup>Based on maximum likelihood estimation.

<sup>6</sup>Calculated by dividing the original alpha level by the total number of comparisons being made (Haynes 2013)

## References

Acock, A. C. 2018. *A Gentle Introduction to Stata (6th Edition)*. Texas, USA: Stata Press.

Allen, K., D. Vella-Brodrick, and L. Waters. 2016. "Fostering School Belonging in Secondary Schools Using a Socio-Ecological Framework." *Educational and Developmental Psychologist* 33, no. 1: 97–121. <https://doi.org/10.1017/edp.2016.5>.

Angus, M., T. McDonald, C. Ormond, R. Rybarczyk, A. Taylor, and A. Winterton. 2010. *Trajectories of Classroom Behaviour and Academic Progress: A Study of Student Engagement With Learning*. Mount Lawley, Western Australia: Edith Cowan University. <https://nla.gov.au/nla.obj-2496106997/view>.

Australian Bureau of Statistics (ABS). 2021. *Socio-Economic Indexes for Areas (SEIFA)*. Canberra, Australia: Australian Bureau of Statistics. <https://www.abs.gov.au/statistics/people/people-and-communities/socio-economic-indexes-areas-seifa-australia/2021>.

Australian Institute of Health and Welfare (AIHW). 2014. Youth Justice in Australia: 2012-2013. Canberra, Australia: Australian Institute of Health and Welfare. <https://pp.aihw.gov.au/getmedia/dcb1d16e-b563-47d5-92a0-4fcfde8fc31f/16731.pdf?v=20230605154244&inline=true>.

Baker, K., M. Siphthorp, and B. Edwards. 2017. *LSAC Technical Paper No. 18: A Longitudinal Measure of Socioeconomic Position in LSAC*. Melbourne, Vic: Longitudinal Survey of Australian Children, Australian Institute of Family Studies. <https://nla.gov.au/nla.obj-571991763/view>.

Baldry, A. C., and D. P. Farrington. 2000. "Bullies and Delinquents: Personal Characteristics and Parental Styles." *Journal of Community & Applied Social Psychology* 10, no. 1: 17–31. [https://doi.org/10.1002/\(sici\)1099-1298\(200001/02\)10:1%3C17::aid-casp526%3E3.0.co;2-m](https://doi.org/10.1002/(sici)1099-1298(200001/02)10:1%3C17::aid-casp526%3E3.0.co;2-m).

Basto-Pereira, M., and D. P. Farrington. 2022. "Developmental Predictors of Offending and Persistence in Crime: A Systematic Review of Meta-Analyses." *Aggression and Violent Behavior* 65: 101761. <https://doi.org/10.1016/j.avb.2022.101761>.

Bonny, A. E., M. T. Britto, B. K. Klostermann, R. W. Hornung, and G. B. Slap. 2000. "School Disconnectedness: Identifying Adolescents at Risk." *Pediatrics* 106, no. 5: 1017–1021. <https://doi.org/10.1542/peds.106.5.1017>.

Cadoret, R. J., C. A. Cain, and R. R. Crowe. 1983. "Evidence for Gene-Environment Interaction in the Development of Adolescent Antisocial Behaviour." *Behavior Genetics* 13, no. 3: 301–310. <https://doi.org/10.1007/BF01071875>.

Cusack, B., and R. Defina. 2013. *LSAC Technical Paper No. 10: Wave 5 Weighting & Non-Response*. Melbourne, Vic: Longitudinal Survey of Australian Children, Australian Institute of Family Studies. <https://growingupinaustralia.gov.au/sites/default/files/tp10.pdf>.

Daraganova, G., K. Mullan, and B. Edwards. 2014. *Attendance in Primary School: Factors and Consequences*. Canberra, Australia: Australian Government Department of Social Services. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2519883](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2519883).

D'Unger, A., K. C. Land, P. L. McCall, and D. S. Nagin. 1998. "How Many Latent Classes of Delinquent/Criminal Careers? Results From Mixed Poisson Regression Analyses." *American Journal of Sociology* 103, no. 6: 1593–1630. <https://doi.org/10.1086/231402>.

du Plessis-Schneider, S. 2020. "When Things at School Are Out of Sync: The Bittersweet Paradox of Suspension and Student Belonging." In *Safe, Supportive, and Inclusive Learning Environments for Young People in*

*Crisis and Trauma*, P. Towl and S. Hemphill, eds. 1st ed., 40–56. Oxfordshire, UK: Routledge. <https://doi.org/10.4324/9780429282102>.

Eshima, N. 2020. *Statistical Data Analysis and Entropy*. Singapore: Springer.

Evans, S. Z., L. G. Simons, and R. L. Simons. 2016. "Factors That Influence Trajectories of Delinquency Throughout Adolescence." *Journal of Youth and Adolescence* 45, no. 1: 156–171. <https://doi.org/10.1007/s10964-014-0197-5>.

Fabozzi, F. J., S. M. Focardi, S. T. Rachev, and B. G. Arshanapalli. 2014. *The Basics of Financial Econometrics*. New Jersey, USA: John Wiley & Sons.

Farrington, D., H. Bergström, and D. Jolliffe. 2023a. "Childhood Predictors of Successful Self-Reported Delinquents." *Psychology, Crime and Law*: 1–21. <https://doi.org/10.1080/1068316x.2023.2228972>.

Farrington D. P. 1986. "Age and Crime." In: *Crime and Justice: An Annual Review of Research*, Tonry M., Morris N. eds. (pp. 189–250). Chicago, USA: Chicago University Press. <https://doi.org/10.1086/449114>.

Farrington, D. P. 1993. "Understanding and Preventing Bullying." *Crime and Justice* 17: 381–458. <https://doi.org/10.1086/449217>.

Farrington, D. P. 2021. "New Findings in the Cambridge Study in Delinquent Development." In *The Encyclopedia of Research Methods in Criminology and Criminal Justice*, J. C. Barnes and D. R. Forde, eds. (pp. 96–103). New Jersey, USA: John Wiley & Sons. <https://doi.org/10.1002/9781119111931.ch20>.

Farrington, D. P., B. Gallagher, L. Morley, St. Ledger, and D. J. West. 1986. "Unemployment, School Leaving, and Crime." *British Journal of Criminology* 26, no. 4: 335–356. <https://doi.org/10.1093/oxfordjournals.bjc.a047626>.

Farrington, D. P., R. Loeber, Y. Yin, and S. J. Anderson. 2002. "Are Within-Individual Causes of Delinquency the Same as Between-Individual Causes?" *Criminal Behaviour and Mental Health* 12, no. 1: 53–68. <https://doi.org/10.1002/cbm.486>.

Farrington, D. P., J. F. MacLeod, and A. R. Piquero. 2016. "Mathematical Models of Criminal Careers." *Journal of Research in Crime and Delinquency* 53, no. 3: 336–355. <https://doi.org/10.1177/0022427815620237>.

Farrington, D. P., A. R. Piquero, W. G. Jennings, and D. Jolliffe. 2023b. "Offending From Childhood to Late Middle Age." In *Springer Briefs in Criminology*. New York, USA: Springer. <https://doi.org/10.1007/978-1-0716-3335-9>.

Farrington, D. P., & Welsh, B. C. 2006. "Saving Children From a Life of Crime: Early Risk Factors and Effective Interventions." <https://doi.org/10.1093/acprof:oso/9780195304091.001.0001>

Filkin, S., D. Mojtahedi, and D. Willmott. 2022. "Motivations for Adolescent Offending and Truancy From School: Retrospective Interviews With Adults Recently Released From a Custodial Prison Sentence in England." *Heliyon* 8, no. 6: E09762. <https://doi.org/10.1016/j.heliyon.2022.e09762>.

Finn, J. D., and K. S. Zimmer. 2012. "Student Engagement: What Is it? Why Does it Matter?" In *Handbook of Research on Student Engagement*, S. L. L. Sandra, A. L. Reschly, and C. Wylie, eds. 97–131. New York, USA: Springer. [https://doi.org/10.1007/978-1-4614-2018-7\\_5](https://doi.org/10.1007/978-1-4614-2018-7_5).

Fredricks, J. A., P. C. Blumenfeld, and A. H. Paris. 2004. "School Engagement: Potential of the Concept, State of the Evidence." *Review of Educational Research* 74, no. 1: 59–109. <https://doi.org/10.3102/00346543074001059>.

Garofalo, S., S. Giovagnoli, M. Orsoni, F. Starita, and M. Benassi. 2022. "Interaction Effect: Are You Doing the Right Thing?" *PLoS One* 17, no. 7: 1–19. <https://doi.org/10.1371/journal.pone.0271668>.

Gerlinger, J., S. Viano, J. H. Gardella, B. W. Fisher, F. Chris Curran, and E. M. Higgins. 2021. "Exclusionary School Discipline and Delinquent

- Outcomes: A Meta-Analysis." *Journal of Youth and Adolescence* 50, no. 8: 1493–1509. <https://doi.org/10.1007/s10964-021-01459-3>.
- Gerth, M. 2020. "Does Truancy Make the Delinquent? A Situational and Longitudinal Analysis of the Truancy–Delinquency Relationship." *European Journal of Criminology* 19, no. 5: 1477. <https://doi.org/10.1177/1477370820952681>.
- Goodenow, C. 1993. "The Psychological Sense of School Membership Among Adolescents: Scale Development and Educational Correlates." *Psychology in the Schools* 30, no. 1: 79–90. [https://doi.org/10.1002/1520-6807\(199301\)30:1%3C79::aid-pits2310300113%3E3.0.co;2-x](https://doi.org/10.1002/1520-6807(199301)30:1%3C79::aid-pits2310300113%3E3.0.co;2-x).
- Graham, L., T. McCarthy, C. Killingly, H. Tancredi, and S. Poed. 2020. *Inquiry Into Suspension, Exclusion and Expulsion Processes in South Australian Government Schools: Final Report*. Brisbane, Queensland: The Centre for Inclusive Education, QUT. <https://www.education.sa.gov.au/docs/support-and-inclusion/engagement-and-wellbeing/student-absences/report-of-an-independent-inquiry-into-suspensions-exclusions-and-expulsions-in-south-australian-government-schools.pdf>.
- Graham, L. J., J. Gillett-Swan, C. Killingly, and P. Van Bergen. 2022. "Does it Matter if Students (Dis)like School? Associations Between School Liking, Teacher and School Connectedness, and Exclusionary Discipline." *Frontiers in Psychology* 13: 1–13. <https://doi.org/10.3389/fpsyg.2022.825036>.
- Graham, L. J., P. Van Bergen, and N. Sweller. 2015. "Caught Between a Rock and a Hard Place: Disruptive Boys' Views on Mainstream and Special Schools in New South Wales, Australia." *Critical Studies in Education* 57, no. 1: 35–54. <https://doi.org/10.1080/17508487.2016.1108209>.
- Gremmen, M. C., Y. H. M. Van Den Berg, C. Steglich, R. Veenstra, and J. K. Dijkstra. 2018. "The Importance of Near-Seated Peers for Elementary Students' Academic Engagement and Achievement." *Journal of Applied Developmental Psychology* 57: 42–52. <https://doi.org/10.1016/j.appdev.2018.04.004>.
- Hausman, J. A., and D. L. McFadden. 1984. "Specification Tests for the Multinomial Logit Model." *Econometrica* 52, no. 5: 1219–1240. <https://doi.org/10.2307/1910997>.
- Haynes, W. 2013. "Bonferroni Correction." In *Encyclopedia of Systems Biology*, W. Dubitzky, O. Wolkenhauer, K. H. Cho, and H. Yokota, eds. 154. New York, USA: Springer. [https://doi.org/10.1007/978-1-4419-9863-7\\_1213](https://doi.org/10.1007/978-1-4419-9863-7_1213).
- Hemphill, S., D. Broderick, and J. Heerde. 2017. *Positive Associations Between School Suspension and Student Problem Behaviour: Recent Australian Findings*. Canberra, Australia: Australian Institute of Criminology. [https://www.aic.gov.au/sites/default/files/2020-09/ti605\\_youth\\_justice\\_in\\_australia.pdf](https://www.aic.gov.au/sites/default/files/2020-09/ti605_youth_justice_in_australia.pdf).
- Hemphill, S. A., T. I. Herrenkohl, S. M. Plenty, J. W. Toumbourou, R. F. Catalano, and B. J. McMorris. 2012. "Pathways From School Suspension to Adolescent Nonviolent Antisocial Behavior in Students in Victoria, Australia and Washington State, United States." *Journal of Community Psychology* 40, no. 3: 301–318. <https://doi.org/10.1002/jcop.20512>.
- Hirschi, T. 1969. *Causes of Delinquency*. California, USA: University Of California Press.
- Holmes, C., A. Brieant, R. Kahn, K. Deater-Deckard, and J. Kim-Spoon. 2018. "Structural Home Environment Effects on Developmental Trajectories of Self-Control and Adolescent Risk Taking." *Journal of Youth and Adolescence* 48, no. 1: 43–55. <https://doi.org/10.1007/s10964-018-0921-7>.
- Jacobsen, W. C. 2019. "School Punishment and Interpersonal Exclusion: Rejection, Withdrawal, and Separation From Friends." *Criminology* 58, no. 1: 35–69. <https://doi.org/10.1111/1745-9125.12227>.
- Jennings, W. G., and J. M. Reingle. 2012. "On the Number and Shape of Developmental/Life-Course Violence, Aggression, and Delinquency Trajectories: A State-Of-The-Art Review." *Journal of Criminal Justice* 40, no. 6: 472–489. <https://doi.org/10.1016/j.jcrimjus.2012.07.001>.
- Jolliffe, D., D. P. Farrington, A. R. Piquero, J. F. Macleod, and S. Van De Weijer. 2017. "Prevalence of Life-Course-Persistent, Adolescence-Limited, and Late-Onset Offenders: A Systematic Review of Prospective Longitudinal Studies." *Aggression and Violent Behavior* 33: 4–14. <https://doi.org/10.1016/j.avb.2017.01.002>.
- Jones, B. L., D. S. Nagin, and K. Roeder. 2001. "A SAS Procedure Based on Mixture Models for Estimating Developmental Trajectories." *Sociological Methods & Research* 29, no. 3: 374–393. <https://doi.org/10.1177/0049124101029003005>.
- Joo, Y. S., and W. K. Lee. 2020. "Does Living in a Chaotic Home Predict Adolescent Delinquency? A Moderated Mediation Model of Impulsivity and School Connectedness." *Children and Youth Services Review* 119: 105617. <https://doi.org/10.1016/j.childyouth.2020.105617>.
- Kearney, C. A., C. González, P. A. Graczyk, and M. J. Fornander. 2019. "Reconciling Contemporary Approaches to School Attendance and School Absenteeism: Toward Promotion and Nimble Response, Global Policy Review and Implementation, and Future Adaptability (Part 1)." *Frontiers in Psychology* 10: 2222. <https://doi.org/10.3389/fpsyg.2019.02222>.
- Klein, M., E. Sosu, and E. Lillywhite. 2022. *School Absenteeism and Educational Attainment-Evidence From the Scottish Longitudinal Study*. Glasgow, UK: University of Strathclyde. <https://doi.org/10.17868/80713>.
- Ladd, G. W., and J. M. Price. 1987. "Predicting Children's Social and School Adjustment Following the Transition From Preschool to Kindergarten." *Child Development* 58, no. 5: 1168. <https://doi.org/10.2307/1130613>.
- Liu, W. 2013. *The Adult Offending and School Dropout Nexus*. Texas, USA: LFB Scholarly Publishing.
- Ly, D. B., R. N. Dudovitz, D. Rünger, N. J. Jackson, and M. D. Wong. 2021. "Chaos in Schools and its Relationship to Adolescent Risk Behaviours." *Academic Pediatrics* 21, no. 2: 329–335. <https://doi.org/10.1016/j.acap.2020.08.015>.
- Martins, J., J. Cunha, S. Lopes, T. Moreira, and P. Rosário. 2022. "School Engagement in Elementary School: A Systematic Review of 35 Years of Research." *Educational Psychology Review* 34, no. 2: 793–849. <https://doi.org/10.1007/s10648-021-09642-5>.
- McGee, T. R., M. R. Hayatbakhsh, W. Bor, R. L. Aird, A. J. Dean, and J. M. Najman. 2015. "The Impact of Snares on the Continuity of Adolescent-Onset Antisocial Behaviour: A Test of Moffitt's Developmental Taxonomy." *Australian and New Zealand Journal of Criminology* 48, no. 3: 345–366. <https://doi.org/10.1177/0004865815589828>.
- McGee, T. R., and T. E. Moffitt. 2018. "The Developmental Taxonomy." In *The Oxford Handbook of Developmental and Life-Course Criminology*, D. Farrington, L. Kazemian, and A. R. Piquero, eds. 149–158. Oxford, UK: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780190201371.001.0001>.
- Moffitt, T. E. 1993. "Adolescence-Limited and Life-Course-Persistent Antisocial Behaviour: A Developmental Taxonomy." *Psychological Review* 100, no. 4: 674–701. <https://doi.org/10.1037/0033-2029x.100.4.674>.
- Moffitt, T. E. 2006. "Life-Course-Persistent Versus Adolescence-Limited Antisocial Behaviour." In *Developmental Psychopathology: Risk, Disorder, and Adaptation*, D. Cicchetti and D. J. Cohen, eds. 570–598. New Jersey, USA: John Wiley & Sons. <https://doi.org/10.1002/9780470939406>.
- Moffitt, T. E. 2018. "Male Antisocial Behaviour in Adolescence and beyond." *Nature Human Behaviour* 2, no. 3: 177–186. <https://doi.org/10.1038/s41562-018-0309-4>.
- Moffitt, T. E., and P. A. Silva. 1988. "Neuropsychological Deficit and Self-Reported Delinquency in an Unselected Birth Cohort." *Journal of the American Academy of Child & Adolescent Psychiatry* 27, no. 2: 233–240. <https://doi.org/10.1097/00004583-198803000-00017>.

- Monahan, K. C., S. Vanderhei, J. Bechtold, and E. Cauffman. 2014. "From the School Yard to the Squad Car: School Discipline, Truancy, and Arrest." *Journal of Youth and Adolescence* 43, no. 7: 1110–1122. <https://doi.org/10.1007/s10964-014-0103-1>.
- Nagin, D. S. 1999. "Analysing Developmental Trajectories: A Semi-parametric, Group-Based Approach." *Psychological Methods* 4, no. 2: 139–157. <https://doi.org/10.1037/1082-989x.4.2.139>.
- Nagin, D. S. 2014. "Group-based Trajectory Modelling: An Overview." *Annals of Nutrition and Metabolism* 65, no. 2-3: 205–210. <https://doi.org/10.1159/000360229>.
- Noltemeyer, A. L., R. M. Ward, and C. Mcloughlin. 2015. "Relationship Between School Suspension and Student Outcomes: A Meta-Analysis." *School Psychology Review* 44, no. 2: 224–240. <https://doi.org/10.17105/spr-14-0008.1>.
- Novak, A. 2019. "The School-To-Prison Pipeline: An Examination of the Association Between Suspension and Justice System Involvement." *Criminal Justice and Behaviour* 46, no. 8: 1165–1180. <https://doi.org/10.1177/0093854819846917>.
- Piquero, A. R. 2023. "'We Study the Past to Understand the Present; We Understand the Present to Guide the Future': The Time Capsule of Developmental and Life-Course Criminology." *Journal of Criminal Justice* 85: 101932. <https://doi.org/10.1016/j.jcrimjus.2022.101932>.
- Reaves, S., S. D. McMahon, S. N. Duffy, and L. Ruiz. 2018. "The Test of Time: A Meta-Analytic Review of the Relation Between School Climate and Problem Behavior." *Aggression and Violent Behavior* 39: 100–108. <https://doi.org/10.1016/j.avb.2018.01.006>.
- Ridenour, T. A., M. T. Greenberg, and E. T. Cook. 2006. "Structure and Validity of People in My Life: A Self-Report Measure of Attachment in Late Childhood." *Journal of Youth and Adolescence* 35, no. 6: 1037–1053. <https://doi.org/10.1007/s10964-006-9070-5>.
- Sampson, R. J., and J. H. Laub. 1990. "Crime and Deviance Over the Life Course: The Salience of Adult Social Bonds." *American Sociological Review* 55, no. 5: 609–627. <https://doi.org/10.2307/2095859>.
- Sampson, R. J., and J. H. Laub. 1993. *Crime in the Making: Pathways and Turning Points through Life*. Washington DC, USA: Harvard University Press, American Sociological Association.
- Skiba, R. J., M. I. Arredondo, and N. T. Williams. 2014. "More Than a Metaphor: The Contribution of Exclusionary Discipline to a School-To-Prison Pipeline." *Equity & Excellence in Education* 47, no. 4: 546–564. <https://doi.org/10.1080/10665684.2014.958965>.
- Statacorp. 2013. *Suest - Seemingly Unrelated Estimation*. Stata. <https://www.stata.com/manuals13/rsuest.pdf>.
- Sutherland, A. 2011. "The Relationship Between School and Youth Offending." *Social Policy Journal of New Zealand* 37: 51–69.
- Ttöfi, M. M., and D. P. Farrington. 2008. "Bullying: Short-Term and Long-Term Effects, and the Importance of Defiance Theory in Explanation and Prevention." *Victims and Offenders* 3, no. 2-3: 289–312. <https://doi.org/10.1080/15564880802143397>.
- Van Hazebroek, B. C. M., A. A. J. Blokland, H. T. Wermink, De Keijser, A. Popma, and L. Van Domburgh. 2019. "Delinquent Development Among Early-Onset Offenders: Identifying and Characterizing Trajectories Based on Frequency Across Types of Offending." *Criminal Justice and Behaviour* 46, no. 11: 1542–1565. <https://doi.org/10.1177/0093854819876306>.
- Varela, J. J., M. A. Zimmerman, A. M. Ryan, S. A. Stoddard, and J. E. Heinze. 2021. "School Attachment and Violent Attitudes Preventing Future Violent Behaviour Among Youth." *Journal of Interpersonal Violence* 36, no. 9: NP5407–NP5426. <https://doi.org/10.1177/0886260518800314>.
- Vittinghoff, E. 2012. *Regression Methods in Biostatistics: Linear, Logistics, Survival, and Repeated Measures Models*. New York: Springer.
- Wang, X., T. G. Blomberg, and S. D. Li. 2005. "Comparison of the Educational Deficiencies of Delinquent and Nondelinquent Students." *Evaluation Review* 29, no. 4: 291–312. <https://doi.org/10.1177/0193841x05275389>.
- Wang, Z., K. Deater-Deckard, S. A. Petrill, and L. A. Thompson. 2012. "Externalizing Problems, Attention Regulation, and Household Chaos: A Longitudinal Behavioural Genetic Study." *Development and Psychopathology* 24, no. 3: 755–769. <https://doi.org/10.1017/s0954579412000351>.
- Welsh, R. O., and S. Little. 2018. "The School Discipline Dilemma: A Comprehensive Review of Disparities and Alternative Approaches." *Review of Educational Research* 88, no. 5: 752–794. <https://doi.org/10.3102/0034654318791582>.
- Wilson, P. R., and J. Braithwaite. 1977. "School, Truancy and Delinquency." In *Delinquency in Australia: A Critical Appraisal*, P. R. Wilson, ed. 73–97. Queensland, Australia: University of Queensland Press.
- Wolf, K. C., and A. Kupchik. 2016. "School Suspensions and Adverse Experiences in Adulthood." *Justice Quarterly* 34, no. 3: 407–430. <https://doi.org/10.1080/07418825.2016.1168475>.
- Yates, D., D. Moore, and G. McCabe. 1999. *The Practice of Statistics*. USA: Freeman.

### Supporting Information

Additional supporting information can be found online in the Supporting Information section.