

Changes in school performance and involvement in the criminal justice system

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This Data Insight investigates changes in school performance and subsequent involvement in the criminal justice system during young adulthood. The research draws on England-wide de-identified data from the National Pupil Database and Police National Computer, made available by the Ministry of Justice and Department for Education as an [ADR UK flagship dataset](#).

Background

Understanding factors that increase or decrease risk of criminal offending is a key research priority to help shape crime prevention policies¹. We already know that educational attainment, school and local community have a powerful relationship with whether young people enter the criminal justice system². For example, a low proportion of young offenders achieve expected school performance levels in Year 6 and Year 11. Meanwhile, high proportions are eligible for free school meals, are looked after children, and have special educational needs (SEN)³.

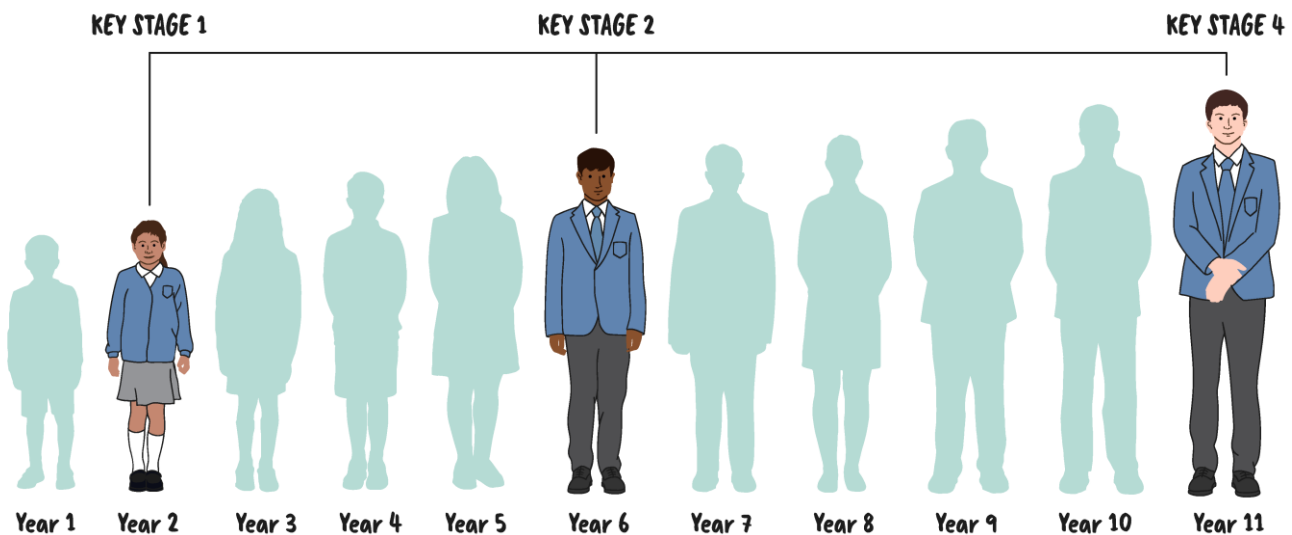
However, little is known about how changes in school performance throughout school might be associated with subsequent criminal offending. It is also unknown whether certain school performance patterns might either exacerbate or mitigate criminal offending risk among groups already known to be at higher risk of this outcome, like those from deprived backgrounds, looked after children, and pupils with SEN. If changes in school performance are associated with increased risk for criminal offending, then tracking school performance could help provide an early indication that pupils might be struggling and in need of additional support. Therefore, we aimed to investigate these relationships using an existing data linkage between the National Pupil Database and Police National Computer.



What we did

We requested de-identified National Pupil Database and Police National Computer data for a cohort of just over 4 million pupils born between 1 September 1990 and 31 August 1997. We investigated their school performance at three key timepoints when statutory testing takes place in England:

- Year 2: key stage 1, typically assessed ages 6-7 years
- Year 6: key stage 2, typically assessed ages 10-11 years
- Year 11: key stage 4, typically assessed ages 15-16 years



At each school year and within each academic cohort, we standardised pupil point scores to have a mean of 0 and a standard deviation of 1. This standardisation procedure means that, for pupils at each timepoint, a positive standardised score indicates above-average performance compared to other pupils in their year, while a negative standardised score indicates below-average performance compared to other pupils in their year.

We used these standardised scores to model school performance trajectories using a procedure called [growth mixture modelling](#). We then used the resulting trajectories in [multilevel logistic regression models](#) to understand their association with criminal justice outcomes. Multilevel modelling takes into account clustering in the data. Clustering describes the phenomenon where individuals in the same group are often more similar to each other than individuals in different groups – in our case, pupils are clustered within schools, and schools are clustered within local authorities:

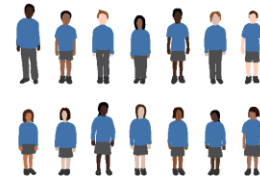
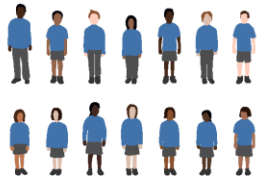
Local Authority



Schools



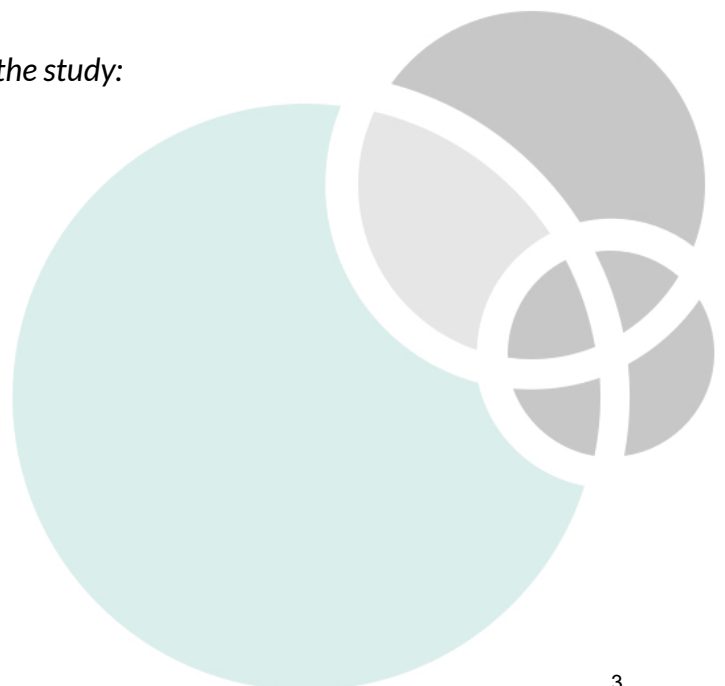
Pupils



We used these models to investigate:

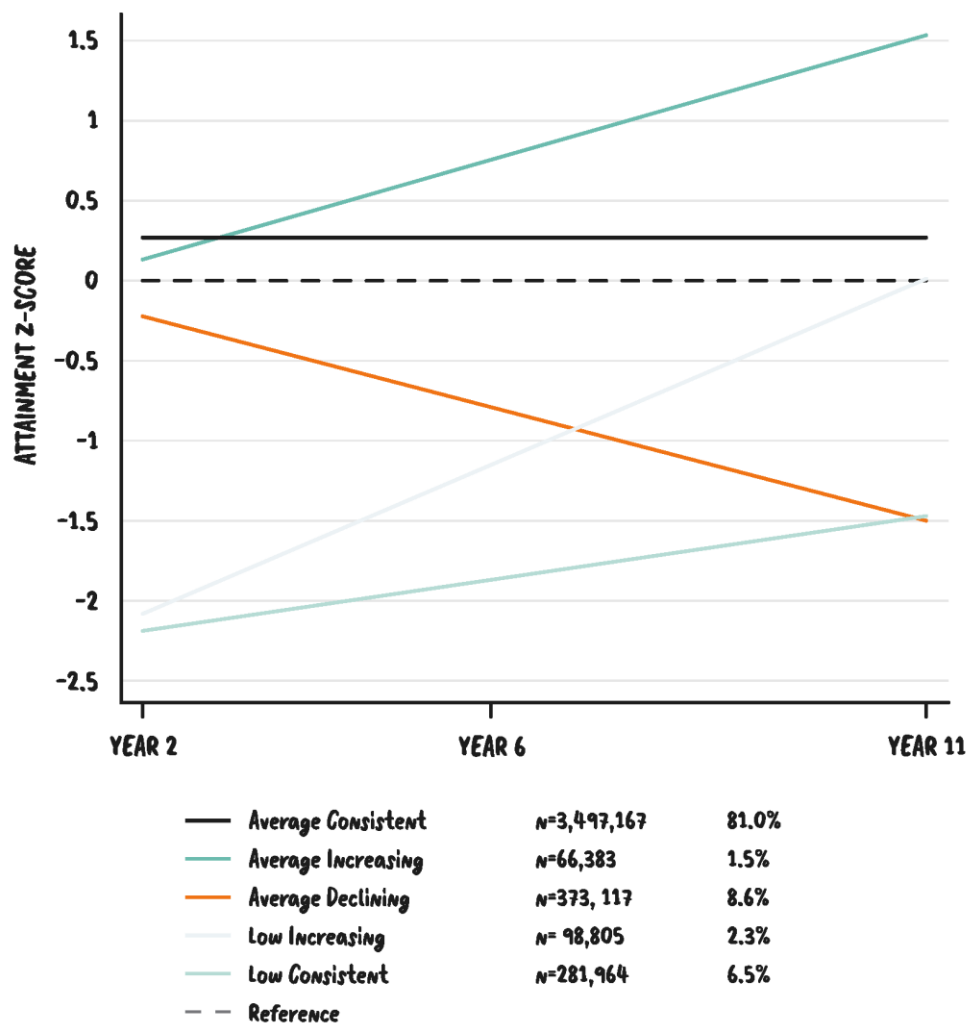
- (1) whether school performance trajectory is associated with subsequently being convicted or cautioned for a first criminal offence, after Year 11 and up to age 21
- (2) whether this relationship varies according to type of offence
- (3) how much offending varies between schools and local authorities
- (4) whether school performance increases or decreases risk of criminal offending among groups known to be at higher risk of this outcome.

You can read more detail about the analysis plans for the study:
[part one](#) and [part two](#).



What we found

We found that pupils could generally be described as following one of five possible school performance trajectories (Figure 1).



**Five school performance trajectories derived from
Growth Mixture Modelling (n=4,317,436)**

Figure 1 (alternative text is provided in the appendix)

- Average Consistent – Pupils generally perform at average or above average levels throughout school
- Average Increasing – Pupils generally perform around average levels in Year 2, and show a relative increase in their school performance, such that by Year 11 they perform at above average levels
- Average Declining – Pupils generally perform around average levels in Year 2, but show a relative decline in their school performance, such that by Year 11 they perform at below average levels
- Low Increasing – Pupils generally perform at below average levels in Year 2, but show a relative increase in their school performance, such that by Year 11 they perform around average levels
- Low Consistent – Pupils generally perform at below average levels throughout school.

To help contextualise these school performance trajectories, we have also summarised the percentage of pupils in each trajectory who achieved expected levels in assessments for each statutory testing year (Table 1).

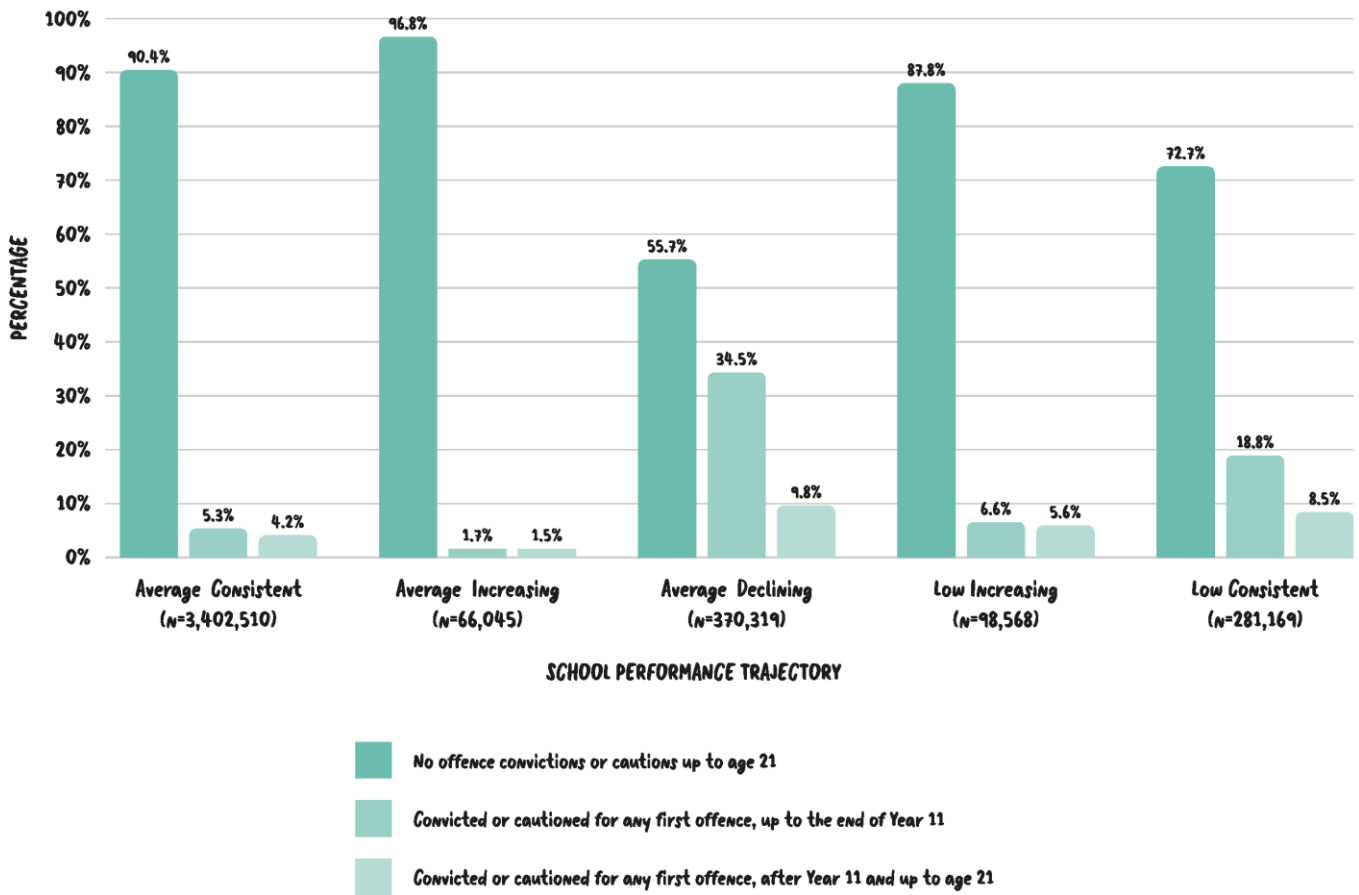
Table 1: Percentage of pupils in each school performance trajectory who achieved expected levels in assessments for each statutory testing year.

	Year 2 – achieved a level 2(b) or above in reading, writing, maths and science	Year 6 – achieved a level 4 or above in English and maths	Year 11 – achieved 5 A* to C grades including English and maths
Average Consistent	86.9%	79.9%	63.9%
Average Increasing	86.4%	95.1%	93.5%
Average Declining	63.0%	29.7%	0.7%
Low Increasing	*	20.0%	21.1%
Low Consistent	*	1.5%	0.4%

* Figure suppressed to avoid potential disclosure

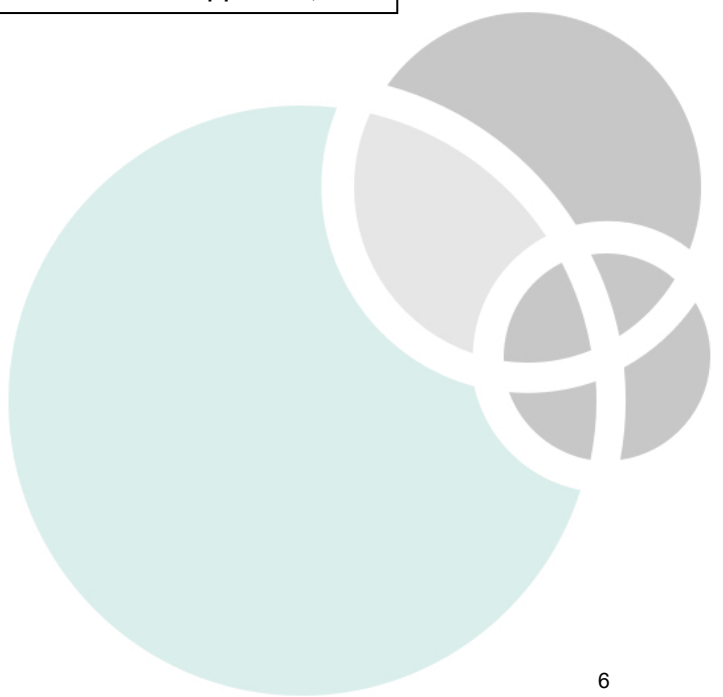
Pupils with Average Declining and Low Consistent school performance trajectories were at higher risk of offence conviction or caution during young adulthood

In total, n=4,218,611 pupils had complete information on all the other variables included in our study, and so were included in the next stage of analysis. Of this group, 8.8% (369,557) of pupils were convicted or cautioned for a first offence before the end of Year 11, and 5.0% (210,936) were convicted or cautioned for a first offence after Year 11 and up to age 21. The school performance trajectories containing the highest proportion of pupils who received offence cautions or convictions were the Average Declining group, followed by the Low Consistent group (Figure 2).



Proportion of pupils in each school performance trajectory who were subsequently convicted or cautioned for a first offence (analyses limited to pupils who had data available for all variables of interest to the study, n=4,218,611)

Figure 2 (alternative text is provided in the appendix)

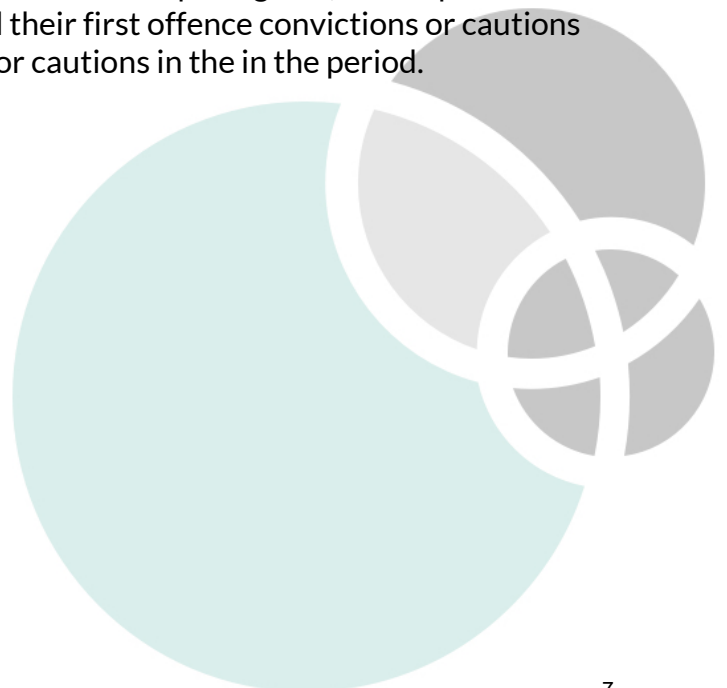


1 in 3 pupils



with declining school performance received a first conviction or caution before the end of Year 11

Because we were primarily investigating offence convictions or cautions which took place after the school performance trajectories, the following analyses focus on the 210,936 pupils convicted or cautioned for a first offence after Year 11 and up to age 21, as compared to the remaining 4,007,675 pupils who either received their first offence convictions or cautions earlier, or who received no offence convictions or cautions in the in the period.



1 in 10 pupils



with declining school performance received a first conviction or caution during young adulthood

Analysis showed that pupils in the Average Declining and Low Consistent groups were just over twice as likely to be convicted or cautioned for a first offence after Year 11 and up to age 21 than those in the Average Consistent group. We adjusted these models to take into account clustering at the school-level, and some other variables measured at the most recently available timepoint to Year 11:

- gender
- ethnicity
- free school meals eligibility
- SEN provision
- looked after child status (in Year 11 only)
- Year 11 assessment year.

The strength of the associations between school performance trajectories and the offending outcome weakened after making these adjustments, but the Average Declining and Low Consistent groups still presented the highest risk.

The association between school performance and offence conviction or caution was similar across different offence types

Among the 4,218,611 pupils analysed, 0.5% (19,017) were convicted or cautioned for a first offence after Year 11 and up to age 21 which was a serious violence offence. Serious violence was defined in accordance with a prior [Department for Education and Ministry of Justice publication](#). Once again, the highest proportion of pupils with this outcome was seen in the Average Declining school performance trajectory (1.0%), followed by the Low Consistent (0.9%), Low Increasing (0.6%), Average Consistent (0.4%), then Average Increasing trajectories (0.1%).

To further investigate whether this pattern of results varied according to offence type, we descriptively summarised the proportion of pupils in each trajectory who were subsequently convicted or cautioned for different types of first offence (Table 2). The findings suggested that the risk of subsequent offending was consistently highest in either the Average Declining or Low Consistent trajectory groups, irrespective of what type of offence it was.

Summary motoring offences were perhaps the least differentiated by school performance trajectory group, with similar proportions across the Average Consistent, Average Declining, Low Increasing and Low Consistent school performance trajectory groups.

Table 2: Proportion of pupils in each school performance trajectory group who were subsequently convicted or cautioned for different types of first offence after Year 11 and up to age 21.

Offence type	School performance trajectory membership				
	Average Consistent (n=3,402,510)	Average Increasing (n=66,045)	Average Declining (n=370,319)	Low Increasing (n=98,568)	Low Consistent (n=281,169)
Violence against the person	0.3%	0.1%	0.6%	0.4%	0.5%
Sexual offences	0.1%	<0.1%	0.1%	0.1%	0.2%
Robbery	0.1%	*	0.2%	0.1%	0.2%
Theft offences	0.7%	0.2%	1.8%	1.1%	1.8%
Criminal damage and arson	0.1%	<0.1%	0.2%	0.1%	0.2%
Drug offences	0.7%	0.3%	1.4%	0.8%	0.9%
Possession of weapons	0.1%	0.1%	0.4%	0.2%	0.4%
Public order offences	0.1%	<0.1%	0.3%	0.2%	0.2%
Miscellaneous crimes against society	0.1%	0.1%	0.2%	0.2%	0.3%
Fraud offences	0.1%	0.1%	0.3%	0.2%	0.3%
Summary non-motoring	1.7%	0.6%	4.6%	2.3%	3.8%
Summary motoring	0.6%	0.3%	0.7%	0.6%	0.6%

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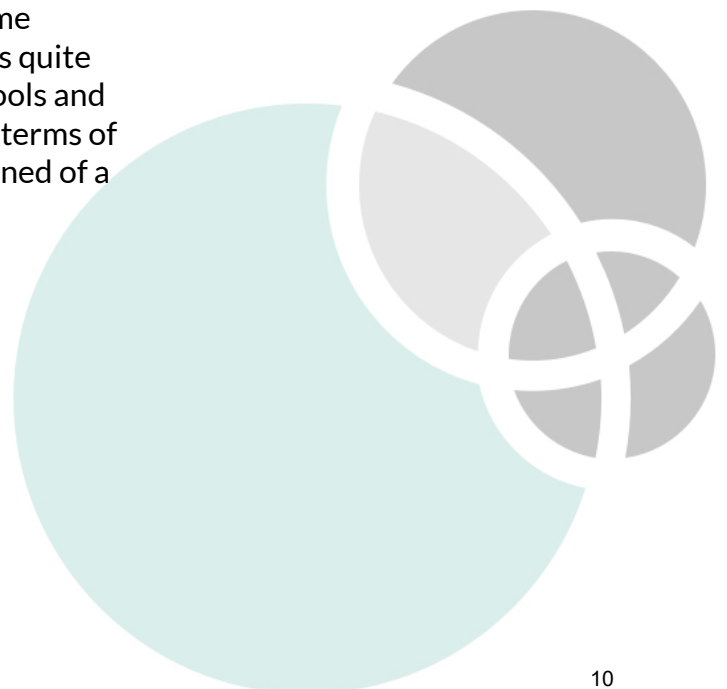
Among those convicted or cautioned for a first offence after Year 11 and up to age 21, we also explored school performance trajectory membership and the number of separate dates on which an offence was recorded in the period. We found that the Average Declining and Low Consistent trajectories had the highest proportion of individuals being convicted or cautioned for multiple offences in the period (Table 3).

Table 3: Number of offending days in the period among those convicted or cautioned for a first offence after Year 11 and up to age 21, stratified by school performance trajectory.

Number of offending days in period	Average Consistent (n=144,059)	Average Increasing (n=1,012)	Average Declining (n=36,332)	Low Increasing (n=5,517)	Low Consistent (n=24,016)
1	67.5%	74.4%	52.4%	62.1%	53.7%
2	17.8%	16.3%	21.2%	18.7%	20.3%
3	6.7%	5.3%	9.9%	7.9%	9.6%
4	3.1%	1.6%	5.5%	4.1%	5.3%
5	1.7%	1.0%	3.3%	2.3%	3.1%
>5	3.1%	1.4%	7.7%	5.0%	8.0%

Pupils from the same schools and local authorities were not very strongly alike in terms of whether they went on to be convicted or cautioned of a first offence during young adulthood

Results indicated that just 5.9% of pupil variation in first offence conviction or caution after Year 11 and up to age 21 was accounted for by the school that pupils attended. An even lower 0.6% was accounted for by the local authority that their school was in. This means that the degree of clustering in our offending outcome variable within schools and local authorities was quite small. In other words, pupils from the same schools and local authorities were not very strongly alike in terms of whether they went on to be convicted or cautioned of a first offence during young adulthood.



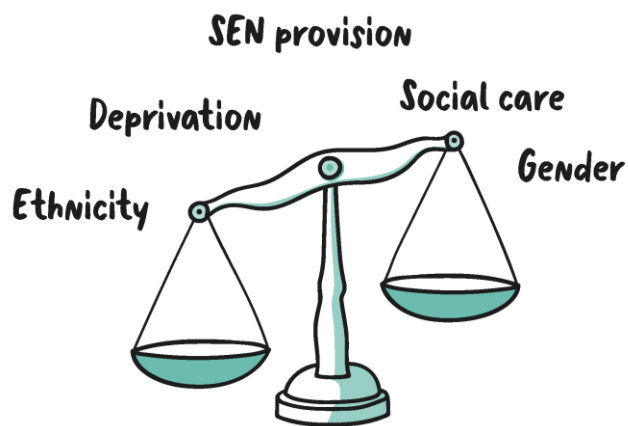
Other sociodemographic characteristics also play an important role in these relationships

Previous studies have shown that some groups of pupils are, on average, at higher risk of criminal justice involvement³. Our findings largely supported this, showing that even after adjusting for school performance trajectory, there was an overall higher risk for subsequent offence conviction or caution among:

- males (as compared to females)
- Black and mixed ethnic groups (as compared to white ethnic groups)
- pupils eligible for free school meals (as compared to non-eligible pupils)
- pupils who are looked after children in Year 11 (as compared to those who are not looked after children in Year 11)
- pupils receiving low levels of SEN provision in the form of [action, action plus, or support](#) (as compared to pupils not receiving any SEN provision)

We also found an overall lower risk for subsequent offence conviction or caution after adjusting for school performance trajectory among:

- Asian ethnic groups (as compared to white ethnic groups)
- pupils receiving high levels of SEN provision in the form of a statement or education, health and care plan (as compared to pupils not receiving any SEN provision).



However, contrary to our expectations, we found that the likelihood of being convicted or cautioned for any first offence after Year 11 and up to age 21 was typically reduced for at-risk groups if they had low or declining school performance trajectories. For example, males were overall at a higher risk of a subsequent first offence conviction or caution than females. But this increased level of risk was not quite as pronounced in the Average Declining and Low Consistent school performance trajectories. More research would be needed to understand this further.

Why it matters

These findings suggest that changes in school performance as early as primary school could help to identify pupils who are struggling and in need of additional support. This could be informative for education practitioners evaluating the needs of their pupil body, or for researchers hoping to identify groups of pupils who might particularly benefit from studies of novel interventions. While we cannot infer any causal relationships from our research, the findings tentatively suggest that educational engagement and support may benefit some pupils and mitigate risk for later criminal justice involvement.

School performance alone may not always independently drive criminal offending: problems in school could co-occur with or even result from multiple other risk factors, such as difficulties with family or home life, having English as a second language, financial instability, mental health problems, gang involvement, criminally offending peer groups, and homelessness. Therefore, declining or consistently below-average school performance might best be taken as a signal to 'check in' with pupils, understand why they're struggling, and offer appropriate support accordingly.

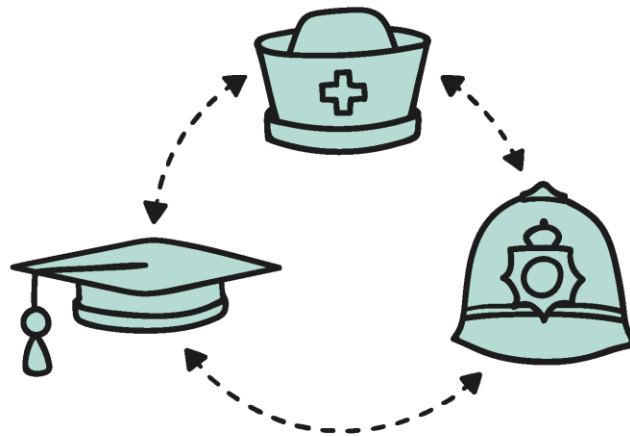
If additional educational support is needed, this could entail 'catch-up' programmes or SEN provision. Schools may also give pupils the choice to pursue alternative educational or vocational pathways which suit their skills and circumstances. Pupils experiencing multiple other risk factors for criminal offending might also be referred to established crime prevention programmes (e.g. Home Office Violence Reduction Units), therapeutic or socio-emotional interventions (e.g. [Khulisa](#)), or local youth groups and initiatives to help young people reach their potential (e.g. [West London Zone](#)).



What next?

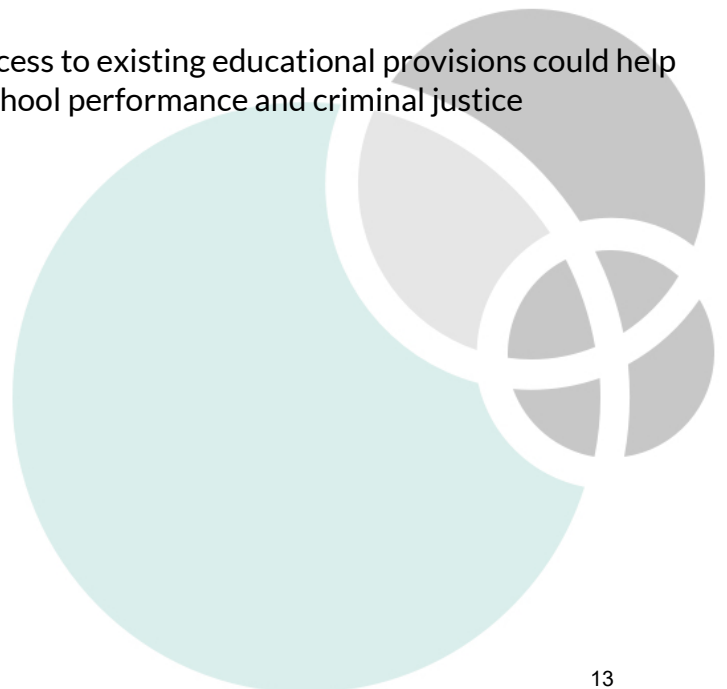
To better understand the role that other factors might play in the association between education and criminal offending, further linkage would be beneficial. For example, this could include integrating health data which captures referral to Child and Adolescent Mental Health Services or Youth Offending Services. This would help us understand the role that mental health problems play in the school performance trajectories we identified⁴, and therefore in criminal justice outcomes.

Social services and family court data would also shed further light on other services that at-risk young people are engaged with, and whether these also present missed opportunities for intervention.



Future research could explore whether educational interventions might increase school performance and decrease offending risk. Some programmes have shown promise in this regard⁵. Recent scoping work has also shown that target trial emulation might be feasible in this data linkage between the National Pupil Database and the Police National Computer. This could enable investigation as to whether SEN provision mitigates offending risk among pupils who show early signs of struggling in school⁶.

This work would show whether increasing access to existing educational provisions could help address the observed association between school performance and criminal justice involvement.



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This work was produced using administrative data accessed through the ONS Secure Research Service. The use of the data in this work does not imply the endorsement of the ONS Secure Research Service or data owners in relation to the interpretation or analysis.

Disclaimer

This work contains statistical data from ONS and accessed through the ONS Secure Research Service. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates.

About ADR UK

This work was supported by ADR UK (Administrative Data Research UK). ADR UK is a partnership transforming the way researchers access the UK's wealth of public sector data, to enable better informed policy decisions that improve people's lives. ADR UK is an Economic and Social Research Council (ESRC) investment (part of UK Research and Innovation). Grant number: ES/W002531/1.

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Appendix: Alternative text

Figure 1: Title reads: Five school performance trajectories derived from Growth Mixture Modelling (N=4,317,436)

The figure shows the shape of the five trajectories on a line graph, as described in the bullet points. A dashed horizontal line is also provided as a reference line.

Labels read:

- Average Consistent, N=3,497,167, 81.0%
- Average Increasing, N=66,383, 1.5%
- Average Declining, N=373,117, 8.6%
- Low Increasing, N=98,805, 2.3%
- Low Consistent, N=281,964, 6.5%

Figure 2: Title reads: Proportion of pupils in each school performance trajectory who were subsequently convicted or cautioned for a first offence (analyses limited to pupils who had data available for all variables of interest to the study, N=4,218,611)

The figure shows a bar chart with the percentage of pupils within each trajectory who:

- Had no offence convictions or cautions up to age 21
- Were convicted or cautioned for any first offence, up to the end of Year 11
- Were convicted or cautioned for any first offence, after Year 11 and up to age 21

The results shown are:

Average Consistent (N=3,402,510)

- No offence convictions or cautions up to age 21: **90.4%**
- Convicted or cautioned for any first offence, up to the end of Year 11: **5.3%**
- Convicted or cautioned for any first offence, after Year 11 and up to age 21: **4.2%**

Average Increasing (N=66,045)

- No offence convictions or cautions up to age 21: **96.8%**
- Convicted or cautioned for any first offence, up to the end of Year 11: **1.7%**
- Convicted or cautioned for any first offence, after Year 11 and up to age 21: **1.5%**

Average Declining (N=370,319)

- No offence convictions or cautions up to age 21: **55.7%**
- Convicted or cautioned for any first offence, up to the end of Year 11: **34.5%**
- Convicted or cautioned for any first offence, after Year 11 and up to age 21: **9.8%**

Low Increasing (N=98,568)

- No offence convictions or cautions up to age 21: **87.8%**
- Convicted or cautioned for any first offence, up to the end of Year 11: **6.6%**
- Convicted or cautioned for any first offence, after Year 11 and up to age 21: **5.6%**

Low Consistent (N=281,169)

- No offence convictions or cautions up to age 21: **72.7%**
- Convicted or cautioned for any first offence, up to the end of Year 11: **18.8%**
- Convicted or cautioned for any first offence, after Year 11 and up to age 21: **8.5%**