

School engagement and attendance in South Australia: an analysis of relationships and trends

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Venta Terauds^a, Akbar Zamanzadeh^b, Sandra Pattison^b & Benjamin Lam^a

^a Education Futures, University of South Australia

^b Measurement Strategy and Research, Department for Education, Government of South Australia

For more information about this report, please contact:
Fraser Mustard Centre
Level 15, 31 Flinders Street
Adelaide, SA 5000
(08) 8226 1206 / (08) 8207 2039
www.frasermustardcentre.sa.edu.au
info.frasermustardcentre@sa.gov.au

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Executive summary

School attendance rates across Australia have been declining over the last decade, and the numbers of students with chronic levels of absence have been increasing. Accompanying this, a decrease in levels of student engagement with school has been observed. This report, prepared for the South Australian Department for Education, utilises data from the Wellbeing and Engagement Collection (WEC), a system wide snapshot of wellbeing and engagement, to examine trends in attendance and engagement within the South Australian public education system, identify factors influencing attendance and engagement, and quantify and determine the relationships between the various aspects of engagement with attendance.

Research from Australia and around the world has established that young people's engagement with school is important to their wellbeing, to their learning, and to their long-term outcomes. For young people to really thrive at school, they need to be both present and engaged. Engagement includes behavioural, emotional, and cognitive dimensions, and these are in complex interplay with attendance. Whilst associations between engagement and attendance have been previously identified, the current project is unique in both scale (utilising more than 330,000 student observations over the period 2016 -- 2021) and its use of causal inference techniques allowing for estimation of a causal relationship between distinct aspects of engagement and student attendance.

The six aspects of student engagement measured within the WEC that were utilised in the analyses were cognitive engagement, emotional engagement with teachers, connectedness to adults at school, peer belonging, school belonging, and school climate.

In the first phase of the analysis, descriptive statistics were calculated to explore changes in engagement and attendance by student grade, gender, sociodemographic characteristics, and over time. To determine potential causal effects of engagement on attendance, a two-stage linear regression technique, utilising an instrumental variable, was then applied. Separate analyses were performed for girls and boys, and for each engagement factor. The key findings were as follows:

- Decreases in engagement and attendance over time were more pronounced for girls and socioeconomically disadvantaged young people. Socioeconomically disadvantaged girls in high school showed the steepest declines in engagement and attendance over time.
- Engagement and attendance were observed to decrease over the course of schooling and increase with socioeconomic advantage. However, the social gradients were not uniform: they were markedly steeper for some types of engagement, such as cognitive engagement, and flatter for others, such as emotional engagement with teachers. Social gradients were larger in high school than primary school, and steepened over time.
- All of the analysed aspects of engagement were found to have a significant positive influence on attendance, with larger effects for girls than boys. Emotional engagement with teachers, connectedness to adults at school and school climate had the strongest impacts on attendance.

To quantify the effects, a one point increase in emotional engagement with teachers (equivalent to changing response from “disagree” to “agree” with statements such as “most of my teachers really listen to what I have to say”) would, holding all other factors constant, result in six less days of absence in a school year for girls and over four days in the year for boys. If a student were to change from the lowest score of 1 to the highest score of 5 in their perceptions of the school climate (from “strongly disagree “ to “strongly agree” in response to statements such as “people care about each other in this school”), this could result in an attendance increase of two and a half school weeks for boys and almost four school weeks per year for girls.

The results of this report show that if we can increase engagement with school, then improved attendance will be one of the many positive outcomes. The three engagement factors with the most powerful effect on attendance relate to young people’s interactions with teachers, with other adults, and with other students in their school. In particular, items in these domains gauge students’ perceptions of whether or not teachers treat them fairly, listen to them, and care about them. Based on the key influential factors identified by our analyses, we recommend that actions to improve engagement be considered, with a focus on developing connections between students and teachers, on ensuring students feel heard, and on respectful relationships in the school environment more generally.

Introduction

Participating, learning, belonging, connected... . The ways in which a child engages with school, and the extent to which they engage, are key in determining the benefits that they will gain from school. Hand in hand with national attendance targets that have been in place for a decade, engagement is now a focus of every jurisdiction across Australia.

Formally, school engagement is a multidimensional construct, widely modelled as comprising the three dimensions of behavioural, cognitive, and emotional engagement (Fredricks et al., 2004). Behavioural engagement refers to participation in classroom and school activities and adherence to school expectations. Cognitive engagement includes students' attitudes towards, approach to, and efforts in schoolwork and learning, and emotional engagement encompasses their feelings toward and relationships with teachers, peers and the school. Some recent studies have added the dimension of agentic engagement, relating to students' perceptions of their autonomy and self-determination in the school environment (Molinari & Mameli, 2018). Further, disengagement may be considered as a distinct construct, not only reflecting lack of engagement, but also factors such as lack of motivation and school-related stress, burnout, and cynicism (Anderson et al., 2019; Wang et al., 2018). We note that there is some overlap between these constructs; indeed, there is much variation in the precise definitions and operationalisation of the engagement dimensions in the literature, so care must be taken in interpreting and comparing results. Whilst attendance may be considered as one aspect of behavioural engagement with school, we consider attendance separately from the various aspects of engagement; this enables us to better examine their relationships with one another as well as with other factors.

The importance of school attendance is well-established, with research from Australia and around the world linking frequent absence from school with poorer academic outcomes, non-completion of school, and lower social and emotional wellbeing (Gottfried, 2014; Patnode et al., 2018). Attendance is influenced by a complex range of school, social and individual factors, but even low rates of absence have been found to impact academic outcomes (Hancock et al., 2013). Patterns of absence tend to be established early on in school, with effects more pronounced for disadvantaged students and accumulating over time (Hancock et al., 2013).

The positive effects of school engagement, both short- and long-term, are similarly well-established. Students who are more cognitively and emotionally engaged with school perform better academically (Miranda-Zapata et al., 2018; Widlund et al., 2021). Particular aspects of emotional engagement linked to academic achievement include perceptions of teacher supportiveness, perceptions of school climate, and identification with school (Maxwell et al., 2017; Tennant et al., 2015). Aspects of emotional engagement with school, along with cognitive engagement, have been linked to higher aspiration and educational completion (Wang & Eccles, 2012; Widlund et al., 2021) and decreases in emotional and behavioural engagement associated with increases in problem behaviours (Markowitz, 2017; Wang & Fredricks, 2014). Higher levels of engagement are associated with increased social and emotional wellbeing, with longitudinal studies showing school engagement as a strong predictor of subsequent wellbeing (Klik et al., 2023; Markowitz, 2017; Shochet et al., 2006).

Attendance is, to some extent, a necessary precursor to engagement; by definition, students who do not attend are unable to engage. However, the converse relationship, how engagement influences attendance, is complex. Higher levels of engagement, unsurprisingly, are associated with lower

levels of unauthorised absence from school (Anderson et al., 2019; Teuscher & Makarova, 2018). In particular, Daily et al. (2020) found a strong link between positive school climate and reduced instances of absenteeism, where “school climate” in this case was a composite measure comprising students’ emotional engagement with teachers and their perceptions of fairness, equity and autonomy at school. Using a combined measure of behavioural and emotional engagement, Virtanen et al. (2021) found that higher levels of student engagement in primary school, and increases in engagement from Grade 6 to Grade 9, predicted less unauthorised absence in upper secondary school. A recent NSW study considered 20 potential predictors of attendance for students in grades 7 and 9 and identified behavioural engagement (specifically, homework behaviour and positive behaviour at school) as the strongest predictors, with school belonging also a strong predictor for students in grade 7 (Centre for Education Statistics and Evaluation, 2022). The observed effects were stronger for students with lower levels of attendance and for socioeconomically disadvantaged students.

Engagement, like attendance, is influenced by a range of individual, school and social factors: “Features of the school environment provide the opportunities and resources for engagement to occur, and students’ skills, attributes, needs, and values determine how they engage in those opportunities.” (Wang & Hofkens, 2020). Family factors have a strong influence on engagement, with student engagement increasing with socioeconomic advantage, parental education level, and social support (Gutman & Schoon, 2018; Salmela-Aro, Upadyaya, et al., 2021). Individual factors associated with increased engagement include students’ curiosity, self-efficacy, and resilience (af Ursin et al., 2021; Anderson et al., 2019; Salmela-Aro, Tang, et al., 2021) and poor learning progress can lead to lower levels of engagement (as well as resulting from it) (Centre for Adolescent Health, 2018). Within the school environment, students’ perceptions of autonomy, fairness and support, and their relationships with teachers and peers, all contribute to their engagement with school (Molinari & Mameli, 2018; Teuscher & Makarova, 2018), as do their perceptions of school culture or climate (Klik et al., 2023; Moreira & Lee, 2020). These influencing factors are encapsulated in self-determination theory (Ryan & Deci, 2020), a widely-used psychological framework for engagement that identifies three basic psychological needs, autonomy, competence and relatedness, as necessary for engagement and wellbeing.

Many studies have observed gender differences in levels of engagement, as well as in the relationships of engagement with other factors, however, consistent patterns have not emerged. For example, Gutman and Schoon (2018) found slightly lower levels of emotional engagement in adolescent boys than girls, but stronger associations between engagement and educational aspiration. An Australian study observed boys to have lower levels of engagement in late primary school than girls, but found no gender differences in the relationship of engagement with subsequent learning outcomes (Centre for Adolescent Health, 2018). Adolescent boys exhibited higher levels of agentic engagement and lower levels of behavioural engagement than girls in a Portuguese study (Molinari & Mameli, 2018) and school connectedness predicted different aspects of subsequent emotional wellbeing for boys and girls in an Australian study (Shochet et al., 2006).

Trends in engagement by age and level of schooling are clearer: on average, a decline in all dimensions of engagement occurs over the transition from primary to secondary school and over adolescence (Anderson et al., 2019; Bakadorova et al., 2020; Moreira & Lee, 2020). Some studies have observed this decline to be followed by an increase in engagement in later secondary school, positing alternative explanations for this. In the British context for example, Gutman and Schoon (2018) suggested that increases in emotional engagement observed between the ages of 14 and 16

may be due to increased academic focus leading up to exams near the end of compulsory schooling. A Finnish study found that, regardless of prior engagement levels or trajectories, students tended to increase in engagement after transitioning to upper secondary school and hypothesised that this could be related to increased student autonomy, leading to a better fit between their needs and the opportunities provided by the school environment (Widlund et al., 2021). This Finnish study is among several recent person-oriented studies that have identified varying trajectories of engagement over the course of schooling, with up to a quarter of students exhibiting stable or increasing levels of engagement over time (Salmela-Aro, Upadyaya, et al., 2021; Virtanen et al., 2021). Interestingly, even when levels of engagement decrease over adolescence, the importance of engagement as a determinant of student emotional and behavioural outcomes does not decline (Markowitz, 2017).

In South Australia, data on student engagement with school is collected as part of the Wellbeing and Engagement Collection (WEC) survey, conducted annually in schools. Having grown steadily in scale and scope since its introduction in 2014, the WEC is now offered to students in grades 4-12 in all school sectors each year, with the majority of government schools and students participating. The WEC captures students' self-reported wellbeing and engagement via a range of measures across four domains: Emotional Wellbeing, Engagement with School, Learning Readiness, and Health and Wellbeing out of School. The specific engagement constructs measured in the WEC include cognitive engagement and various separate aspects of emotional engagement, including students' feelings of connectedness and support with regards to teachers, peers, and the school. Further details of these engagement measures are provided in the methodology section of the report. The large number of students participating in the WEC, and the ability to link with other administrative data, enables comprehensive cross-sectional and longitudinal analyses to be conducted to support informed educational decision making. Of some relevance to the current investigation is a recent South Australian Department for Education (DfE) report into the relationships between wellbeing, engagement and academic outcomes, which echoed international findings that students with higher levels of cognitive engagement and emotional engagement with their teachers are more likely to achieve well academically (Boulton et al., 2022).

The current report adds to this body of work by utilising WEC data from 2016 to 2021 linked with student enrolment and attendance data to investigate factors relating to different levels of engagement and attendance, how they are changing over time, and how the various engagement factors may influence attendance. Student engagement is malleable (Fredricks et al., 2004), meaning that it is responsive to changes in the school environment. A clear understanding of patterns and trends in engagement and attendance in South Australian government schools will enable the identification of potential areas in which action may be taken to improve engagement and attendance.

Research questions

The following research questions were identified for this study.

1. What patterns exist in the decline in engagement and attendance over time and what characterises schools and students that are more (or less) affected?
2. What relationships exist between the various dimensions of engagement and attendance and, in particular, does engagement influence attendance?

Methods

The study consisted of two parts. An initial descriptive analysis of the data, where engagement and attendance measures were explored across a variety of descriptive characteristics, was followed by a two-phase regression analysis, utilising instrumental variable techniques to enable the inference of casual relationships between engagement and attendance. The project used data from the South Australian Wellbeing and Engagement Collection (WEC) (Gregory et al., 2021) which can be accessed at aggregate level (Lam et al., 2023) or unit level (Gregory et al., 2021). All statistical analyses were conducted in Stata 18 (StataCorp, 2023).

Sample

The sample for the initial part of this study comprised all students in SA government schools who participated in a WEC between 2016 and 2021 inclusive¹ and for whom attendance data was available. We note that not all students participate in the WEC for a variety of reasons, primarily due to the school not choosing to participate. The number of eligible students in the sample ranged from 31,937 in 2016 to 76,655 in 2021, with a total of 336,675 observations over the six years. A breakdown of the sample by collection year and demographic characteristics may be found in Table 1 of the Results. Demographic characteristics of those excluded from the sample are also discussed in the results section and summarised in Table A1 of the appendix (2021 snapshot).

As the modelling techniques utilised listwise deletion (whereby each observation must have no missing variables), the sample for the initial explorative descriptive statistics is slightly different from that used in the subsequent regression modelling.

Measures

Engagement

Six measures of student engagement with school were selected from the WEC to be used in the analyses:

- cognitive engagement: motivation, effort and attitude to learning;
- emotional engagement with teachers: perceptions of teacher interest, care and fairness;
- connectedness to adults at school: perception of supportive relationship with an adult at school;
- school belonging: perception of fitting in and feeling valued at school;
- peer belonging: perception of fitting in with peers and a feeling part of a group;
- school climate: perception of school environment as caring and respectful.

A further WEC construct, engagement (flow), was used as an instrumental variable in the model. This construct represents a student's general tendency to become absorbed in tasks or activities; it is not an aspect of school engagement, but is related to the school engagement measures (Gregory et al., 2016). Each of these measures consists of multiple items with responses on a Likert scale which were averaged to create a student's scale score for the measure (see Table A16 in the appendix for full details of items and response options). Connectedness to adults at school and emotional engagement with teachers are scored on a 4-point Likert scale (values in the range 1-4) and the remainder of the measures on a 5-point Likert scale (values in the range 1-5). Students' level of each engagement factor was categorised as "Low", "Medium", or "High", based on their scaled score.

¹ Note that data from pilots and trials are not included and we use the Term 3 2020 collection.

Attendance

The analyses used DfE attendance data for terms 1-3 of each year. The attendance rate was calculated as the ratio of number of days attended to number of days enrolled for each student for the period (as a percentage). Based on these attendance rates, a student's level of attendance was categorised as "at least 90%", "between 80% and 90%", or "less than 80%". Ninety percent is the national target/ACARA reporting threshold for attendance, and the latter two categories align with the DfE's classifications of "habitual" and "chronic" non-attendance respectively.

Socio-demographics

Administrative school enrolment census data used included students' school grade, postcode of residence, family language background (non-English speaking or only English-speaking) and highest level of formal education of the parent or guardian. The latter was used to form a dichotomous variable signifying whether or not a child had a parent/guardian with a Bachelor degree-level qualification. Gender was self-reported via the WEC (or taken from census data where this was missing). Postcodes were used to determine community-level socioeconomic status and geographical remoteness via the Australian Bureau of Statistics' Socio-Economic Indexes for Areas (SEIFA) Index of Relative Socioeconomic Advantage and Disadvantage (IRSAD) (ranging from Quintile 1, most disadvantaged to Quintile 5, most advantaged) (Australian Bureau of Statistics, 2021) and Accessibility and Remoteness Index of Australia (ARIA) (ranging from Major Cities to Very Remote communities) (Australian Bureau of Statistics, 2016) respectively. The school-level measure of socio-educational disadvantage (IED) also utilises school census data; this is a DfE-created index (ranging from 1, most disadvantaged to 7, least disadvantaged), that combines information regarding parental education, occupation and economic resources, student mobility and Aboriginality.

Statistical Methodology

Initial descriptive statistics for the sample were calculated to show demographic characteristics along with the mean engagement scores and attendance rate, and the proportions of students with each level of engagement and attendance, in each year. Further analyses were then conducted, considering engagement and attendance by student grade, gender, sociodemographic characteristics, and over time. For the analyses of changes over time, the years 2019 and 2021 were used, as 2021 was the most recent year for which data was available and 2019 was the earliest year with a comparable sample, in that the WEC was offered to all school grades 4-12. Due to the correlation and overlap of student ARIA and school IED with student SEIFA, the former two variables were not analysed separately and were not included in the regression analyses.

To determine potential causal effects of engagement on attendance, a two-stage linear regression technique was then applied. Based on the results of the initial analyses and background literature, separate analyses were performed for girls and boys, and for each engagement factor, to enable differing relationships to be identified. For each gender and engagement factor, the equation modelling the relationship of attendance with engagement had the form

$$y_{ijk}^G = \alpha + \beta X_{ijk}^G + \theta Z_{ijk}^G + \gamma_j + \tau_k + \varepsilon_{ijk}, \quad (1)$$

where y represents the attendance rate, X is the engagement factor, and Z is a vector of sociodemographic covariates. The terms γ and τ capture the fixed effects for years and schools respectively, accounting for cohort changes over time and the grouping of students within schools, and ε is an error term. The superscript G signifies the gender, the subscripts i, j , and k respectively index the student, year and school, and α, β , and θ are the coefficients of the predictor variables to be estimated. The covariates included, as described in the measures section above, were students' grade level, family language background, parent/guardian education level, and SEIFA quintile.

Initially, an ordinary least squares (OLS) regression was conducted to estimate the coefficients in Equation (1). We note that this can show significant relationships between the variables of interest but does not allow inference of a causal relationship. As noted previously, there may be a reverse causal effect, that is, students' engagement may also be affected by their attendance; further, there may be other factors that are not included in the model that influence both engagement and attendance. The two stage least squares (2SLS) method (Angrist & Pischke, 2009) addresses this possible endogeneity issue. Briefly, this technique utilises an instrumental variable, in our case engagement (flow), that is correlated with the predictor variables (here, the engagement factors) but not correlated directly with the outcome variable (attendance rate) or the other covariates. This allows the variation in the predictor variables that is exogenous (related only to external causes) to be determined, and then used to estimate the causal effects of these on the outcome variable. The linear regression used in the first stage of the 2SLS method, again for each gender and engagement factor, had the following form:

$$X_{ijk}^G = \alpha + \Omega F_{ijk}^G + \theta Z_{ijk}^G + \gamma_j + \tau_k + \varepsilon_{ijk}. \quad (2)$$

Here, the engagement factor X is the dependent variable and F represents engagement (flow). As above, Z is the vector of sociodemographic covariates, γ and τ capture the fixed effects for years and schools respectively, ε is an error term, the superscript G signifies the gender, the subscripts i , j , and k index the individual student, year and school, respectively, and α , β , and θ are the coefficients to be estimated. Note that, although the symbols for some coefficients and the fixed effect variables in equations (1) and (2) are the same, they take different values in each case. After performing the first stage regressions (2) and confirming the significance of the associations between the instrument and the predictor variables, the second stage regression (1) was estimated, this time using for engagement X the predicted values based on the first stage estimates. Finally, the Cragg-Donald F -statistic, as outlined by Stock and Yogo (2002), was calculated to check the exogeneity condition in the second-stage regressions.

Results

Descriptive analyses

The demographic characteristics of the sample for each year are shown in Table 1. We note that although the number of students participating has grown each year (apart from the COVID-19-disrupted 2020), the demographic make-up of the sample has remained relatively stable. The first year in which all students in grades 4-12 were offered the WEC was 2019, and participation rates in upper secondary school remain lower than in primary school.

The demographic characteristics of the SA government school population, along with those excluded from the sample due to non-participation in the WEC or missing attendance data are provided in Table A1 in the appendix (only 2021 data is presented, to aid comparisons). The excluded groups contain a much higher proportion of Year 11 and 12 students than the population, and a higher proportion of socioeconomically disadvantaged students and schools. This socioeconomic skew is more evident in the no-WEC group, with boys and remote students also over-represented in this group. Further information regarding non-response bias in the WEC and potential strategies to address this may be found in a previous report commissioned by the DfE (Gregory & Monroy, 2022). The average attendance rate of students who did not sit the WEC is markedly lower, and the proportion of students with a less than 80% attendance rate much higher, compared to the students in our sample (Table A1). For the students without attendance data who sat the WEC however, engagement levels were very similar to those of the sample, as can be seen from Table A2 in the appendix.

Table 1. Demographic characteristics of sample by year

	2016	2017	2018	2019	2020	2021	Total
N	31,937 (9.5%)	47,954 (14.2%)	54,992 (16.3%)	68,621 (20.4%)	56,516 (16.8%)	76,655 (22.8%)	336,675 (100.0%)
Student Year Level							
4	0 (0.0%)	8,130 (17.0%)	9,943 (18.1%)	9,535 (13.9%)	8,335 (14.7%)	10,539 (13.8%)	46,482 (13.8%)
5	0 (0.0%)	8,077 (16.8%)	10,280 (18.7%)	9,774 (14.2%)	8,808 (15.6%)	10,437 (13.6%)	47,376 (14.1%)
6	8,418 (26.4%)	9,386 (19.6%)	9,919 (18.0%)	9,799 (14.3%)	8,438 (14.9%)	10,608 (13.8%)	56,568 (16.8%)
7	8,690 (27.2%)	8,034 (16.8%)	9,493 (17.3%)	8,429 (12.3%)	7,378 (13.1%)	9,615 (12.5%)	51,639 (15.3%)
8	7,678 (24.0%)	7,628 (15.9%)	7,862 (14.3%)	8,195 (11.9%)	6,133 (10.9%)	9,183 (12.0%)	46,679 (13.9%)
9	7,151 (22.4%)	6,689 (14.0%)	7,495 (13.6%)	6,892 (10.0%)	5,887 (10.4%)	8,024 (10.5%)	42,138 (12.5%)
10	0 (0.0%)	0 (0.0%)	0 (0.0%)	6,509 (9.5%)	4,849 (8.6%)	7,607 (9.9%)	18,965 (5.6%)
11	0 (0.0%)	0 (0.0%)	0 (0.0%)	5,452 (7.9%)	4,167 (7.4%)	5,978 (7.8%)	15,597 (4.6%)
12	0 (0.0%)	0 (0.0%)	0 (0.0%)	4,035 (5.9%)	2,520 (4.5%)	4,650 (6.1%)	11,205 (3.3%)
Student Gender							
Boy	16,277 (51.0%)	24,512 (51.1%)	28,048 (51.0%)	34,793 (50.7%)	29,296 (51.8%)	39,081 (51.0%)	172,007 (51.1%)
Girl	15,660 (49.0%)	23,442 (48.9%)	26,944 (49.0%)	33,270 (48.5%)	27,220 (48.2%)	36,415 (47.5%)	162,951 (48.4%)
Other	0 (0.0%)	0 (0.0%)	0 (0.0%)	558 (0.8%)	0 (0.0%)	1,115 (1.5%)	1,673 (0.5%)
Student SEIFA 2016 IRSAD Quintile (STATE)							
1 (Most disadvantaged)	8,760 (27.5%)	13,229 (27.8%)	14,871 (27.2%)	17,820 (26.1%)	15,030 (26.7%)	19,696 (26.1%)	89,406 (26.8%)
2	5,367 (16.9%)	7,936 (16.7%)	9,012 (16.5%)	11,283 (16.5%)	9,478 (16.8%)	11,812 (15.6%)	54,888 (16.4%)
3	5,042 (15.9%)	7,348 (15.4%)	8,681 (15.9%)	10,797 (15.8%)	8,809 (15.7%)	11,975 (15.9%)	52,652 (15.8%)
4	6,417 (20.2%)	9,659 (20.3%)	11,037 (20.2%)	14,001 (20.5%)	11,271 (20.0%)	15,866 (21.0%)	68,251 (20.4%)
5 (Most advantaged)	6,219 (19.6%)	9,427 (19.8%)	11,109 (20.3%)	14,289 (21.0%)	11,686 (20.8%)	16,150 (21.4%)	68,880 (20.6%)
School IED							
1 (Most disadvantaged)	789 (2.5%)	1,119 (2.3%)	1,591 (2.9%)	1,718 (2.5%)	1,427 (2.5%)	1,892 (2.5%)	8,536 (2.5%)
2	5,037 (15.8%)	6,977 (14.5%)	7,789 (14.2%)	9,730 (14.2%)	8,215 (14.5%)	11,496 (15.0%)	49,244 (14.6%)
3	3,241 (10.1%)	5,082 (10.6%)	5,766 (10.5%)	7,628 (11.1%)	7,200 (12.7%)	7,807 (10.2%)	36,724 (10.9%)
4	4,002 (12.5%)	5,939 (12.4%)	6,389 (11.6%)	8,385 (12.2%)	6,106 (10.8%)	8,983 (11.7%)	39,804 (11.8%)
5	6,683 (20.9%)	9,839 (20.5%)	11,031 (20.1%)	14,018 (20.4%)	10,338 (18.3%)	15,544 (20.3%)	67,453 (20.0%)
6	7,133 (22.3%)	10,409 (21.7%)	12,638 (23.0%)	15,689 (22.9%)	13,603 (24.1%)	17,648 (23.0%)	77,120 (22.9%)
7 (Most advantaged)	5,047 (15.8%)	8,589 (17.9%)	9,788 (17.8%)	11,453 (16.7%)	9,626 (17.0%)	13,282 (17.3%)	57,785 (17.2%)
Student Geographical remoteness (ARIA)							
Major Cities	21,245 (66.8%)	32,991 (69.3%)	38,363 (70.1%)	47,416 (69.5%)	38,272 (68.0%)	53,617 (71.0%)	231,904 (69.4%)
Inner Regional	4,686 (14.7%)	6,651 (14.0%)	7,628 (13.9%)	10,046 (14.7%)	9,259 (16.5%)	10,673 (14.1%)	48,943 (14.6%)
Outer Regional	4,567 (14.4%)	6,065 (12.7%)	6,682 (12.2%)	8,369 (12.3%)	6,265 (11.1%)	8,587 (11.4%)	40,535 (12.1%)
Remote	949 (3.0%)	1,392 (2.9%)	1,543 (2.8%)	2,140 (3.1%)	2,089 (3.7%)	2,216 (2.9%)	10,329 (3.1%)
Very Remote	362 (1.1%)	504 (1.1%)	500 (0.9%)	223 (0.3%)	396 (0.7%)	413 (0.5%)	2,398 (0.7%)
Student Family language background							
English only	24,686 (77.4%)	37,223 (77.8%)	42,117 (76.6%)	52,285 (76.4%)	41,716 (73.9%)	56,633 (74.9%)	254,660 (76.0%)
Non-English	7,227 (22.6%)	10,610 (22.2%)	12,856 (23.4%)	16,156 (23.6%)	14,748 (26.1%)	19,015 (25.1%)	80,612 (24.0%)
Student Highest education level of parents/guardians							
Other	22,396 (72.1%)	32,793 (70.2%)	36,796 (68.7%)	45,354 (68.1%)	35,829 (65.6%)	48,059 (65.1%)	221,227 (67.8%)
Bachelor degree or higher	8,681 (27.9%)	13,919 (29.8%)	16,796 (31.3%)	21,198 (31.9%)	18,774 (34.4%)	25,754 (34.9%)	105,122 (32.2%)

The numbers and proportions of students in the sample with low, medium and high levels of engagement and attendance, and the mean engagement and attendance of the sample, in each year, are provided in Table A3 in the appendix. We note that, although a general trend of decreasing engagement and attendance can be observed, prior to 2019 the composition of the sample changed from 2016-2017 and from 2018-2019, as further grades were progressively included in the WEC.

Over the period 2019-2021, the proportion of the sample attending school at least ninety percent of the time (equivalently, absent for less than one day per fortnight of school) dropped from 70.3% to 68%, and the number of students attending less than eighty percent of the time (missing more than one day per week of school) increased from 9.3% to 11.2%, an increase of more than 2000 students (Table A3 in the appendix). Over the same period, the proportions of students with high levels of cognitive engagement, emotional engagement with teachers, and perceptions of school climate each dropped by around 2 percentage points, and for peer belonging and school belonging, the drop was four percentage points. Interestingly, levels of connectedness to adults at school bucked this trend, with an increase observed (Table A3 in the appendix).

Considering the 2021 data for a cross-sectional perspective, three quarters of grade four children attended school more than 90% of the time, but by late high school, only three in every five maintained this level of attendance (Table 2). Whilst approximately one in nine students overall had an attendance rate of less than 80%, this proportion increased to more than one in six of the most socioeconomically disadvantaged students. Further demographic characteristics of students by level of attendance may be found in Table A4 in the appendix.

Table 2. Number and proportion of students in each attendance category for each student grade (2021)

	Attendance Rate					
	At least 90%		80-90%		Less than 80%	
2021	52,118	(68.0%)	15,952	(20.8%)	8,585	(11.2%)
Student Year Level						
4	7,993	(75.8%)	1,856	(17.6%)	690	(6.5%)
5	7,777	(74.5%)	1,913	(18.3%)	747	(7.2%)
6	7,813	(73.7%)	1,987	(18.7%)	808	(7.6%)
7	6,545	(68.1%)	2,031	(21.1%)	1,039	(10.8%)
8	6,242	(68.0%)	1,877	(20.4%)	1,064	(11.6%)
9	4,897	(61.0%)	1,895	(23.6%)	1,232	(15.4%)
10	4,598	(60.4%)	1,821	(23.9%)	1,188	(15.6%)
11	3,537	(59.2%)	1,443	(24.1%)	998	(16.7%)
12	2,708	(58.2%)	1,125	(24.2%)	817	(17.6%)

Figure 1 and Figure 2 show how average levels of attendance and all forms of engagement decline as a young person progresses through school, with some increase noticeable in the senior secondary grades (more so for engagement than attendance), and differing trajectories for different aspects of engagement.

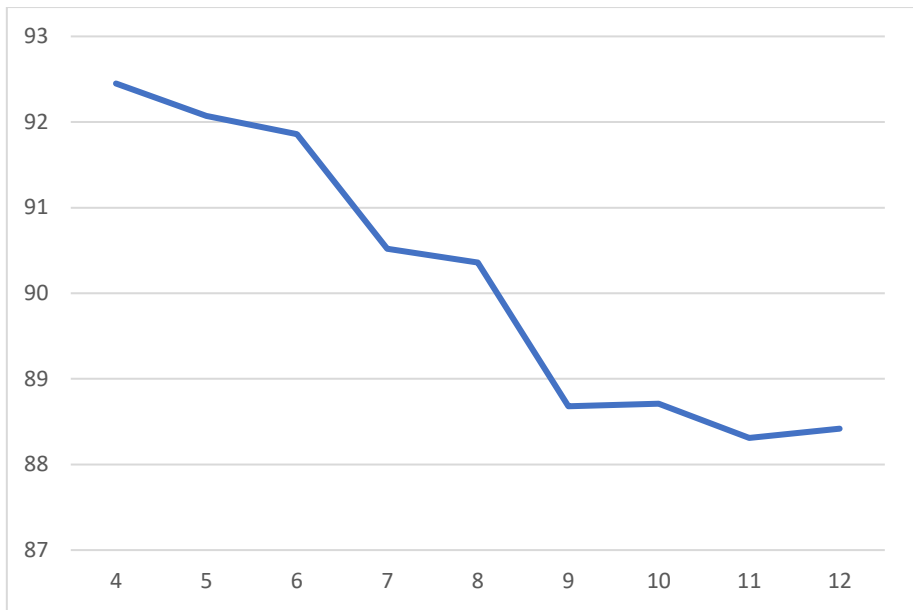


Figure 1. Average attendance rate by student grade (2021)

The steepest declines are evident for school climate and school belonging (0.9 and 0.7 of a standard deviation respectively), followed by cognitive engagement (approx. two thirds of a standard deviation). The other factors have flatter trajectories, however the difference between the maximum and minimum levels of emotional engagement with teachers over schooling is equivalent to around two thirds of a standard deviation for this measure.

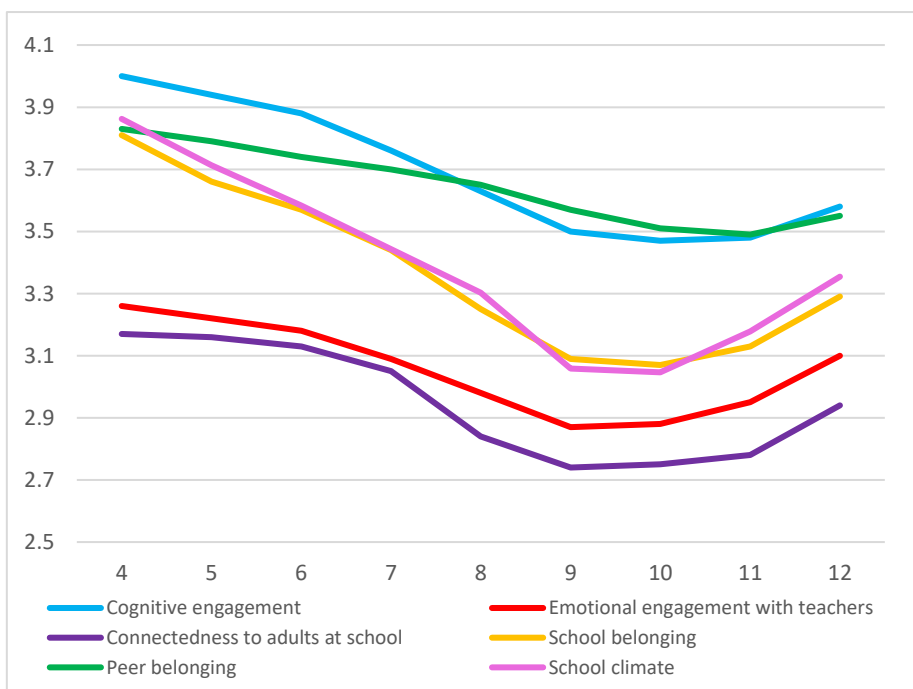


Figure 2. Average level of each engagement factor by student grade (2021)

Splitting the cohort now by gender, we see that trajectories of engagement over schooling are different for boys and girls, tending to decline more steeply for girls. There is, further, evidence of some change in these trajectories over time. Figure 3 shows cognitive engagement for girls and boys in grades 4 through 12 in 2019 and 2021. In each of these years, the drop in cognitive engagement over early high school is steeper for girls than boys, but for girls, this effect became more

pronounced over time, with levels of cognitive engagement decreasing over time for girls in every grade except 12, whilst levels for boys in each grade remained relatively stable over time.

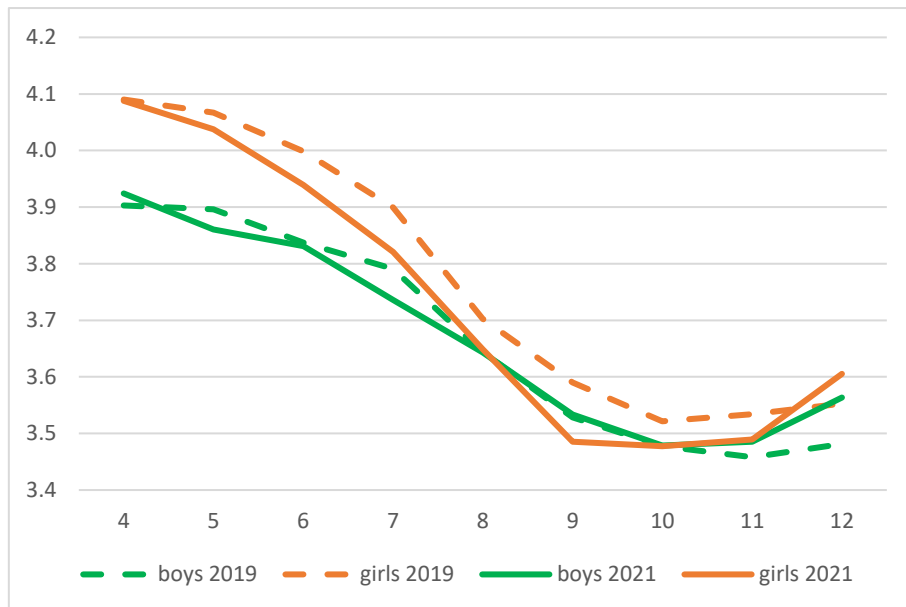


Figure 3. Cognitive engagement by gender and grade (2019 and 2021)

Young people’s perceptions of the school culture (school climate) similarly show a marked decline as they progress through school, with somewhat more of an increase in grades 11 and 12 than seen in cognitive engagement. The general uptick is likely due in part to less engaged students leaving school in grade 11 or 12, increasing the sample’s engagement scores, with other factors such as increased maturity or autonomy, as mentioned in the introduction, potentially also playing a role. The trajectories for boys and girls are more similar than with cognitive engagement, with levels decreasing over time for both groups, although again a larger decrease for girls than boys in the middle secondary grades (Figure 4).

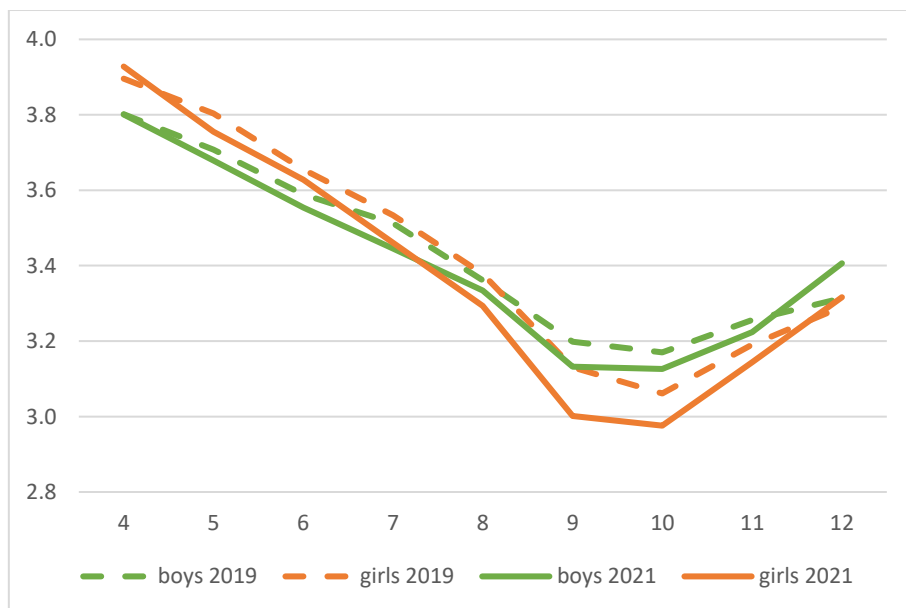


Figure 4. School climate by gender and grade (2019 and 2021)

We note the difference of almost 1 point between girls’ perceptions of school climate in early primary and mid secondary school in 2021; on the 5-point Likert scale for these measures, this translates to the majority of girls changing from, for example, “strongly agree” to “agree” or from “neutral” to “disagree” with statements such as “Teachers and students treat each other with respect in this school”.

There was a clear change in attendance trajectories over the course of schooling between our focus years of 2019 and 2021, with attendance rates for both boys and girls in grades 7 through 12 decreasing over this time period, while girls’ attendance rates in primary school were relatively stable and boys’ attendance rates in primary school increased slightly (Figure 5). The largest decreases in attendance rates over time, for both genders, were in grade 9 students. Girls’ attendance rates over the course of schooling showed a steeper decrease than those of boys, with the largest decline (for both the 2019 and 2021 cohorts) occurring between grades 8 and 11. The 2019 cohorts showed an uptick in attendance from grade 11 to 12, but this was not evident in the 2021 cohort, with quite similar attendance rates for grades 11 and 12.

The average levels of attendance and all engagement factors, by gender and student grade for 2019 and 2021, are provided in Table A5 of the appendix. We note that average levels of engagement and attendance are much lower for young people not identifying as a boy or girl, however we did not conduct analyses separately for this group due to its relatively small size.

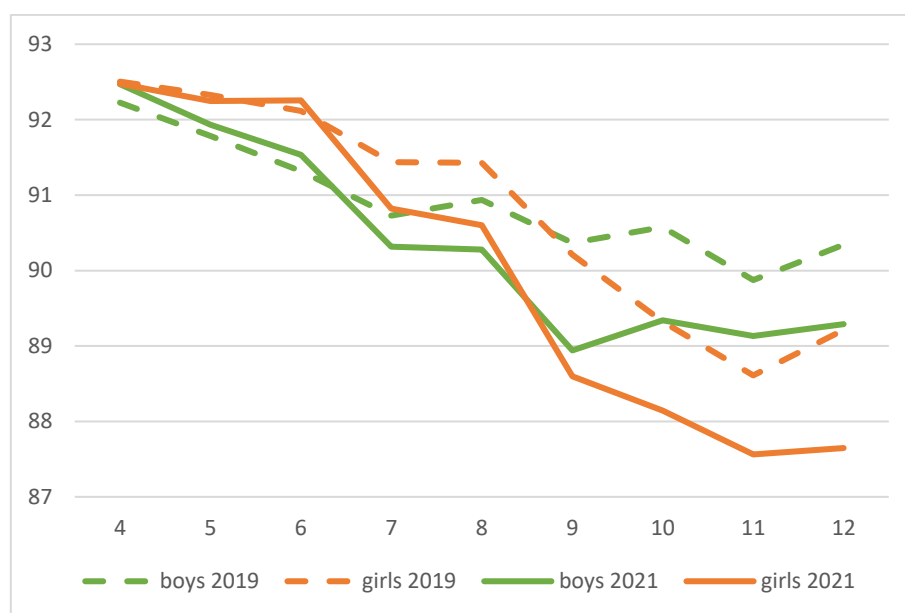


Figure 5. Attendance by gender and grade (2019 and 2021)

As much of the drop in levels of engagement and attendance occurs over high school, we consider the relationship of engagement with some further sociodemographic factors separately for primary and high school students. We highlight some of the high school results here, and provide complete data in table form in the appendix. To ensure consistent comparisons between 2019 and 2021 (when grade 7 in South Australian schools moved from primary school into high school), we form the “high school” cohorts from students in grades 8, 9 and 10 in each of these years.

The social gradient in cognitive engagement can be seen clearly in Figure 6, with higher levels of cognitive engagement in more socioeconomically advantaged students. Socioeconomic advantage

further appeared to have a protective effect for boys but not for girls: the most advantaged groups of boys increased in their cognitive engagement over time, whilst the level of cognitive engagement over time decreased for girls in all SEIFA quintiles. This meant that the social gradient increased over time, more so for boys.

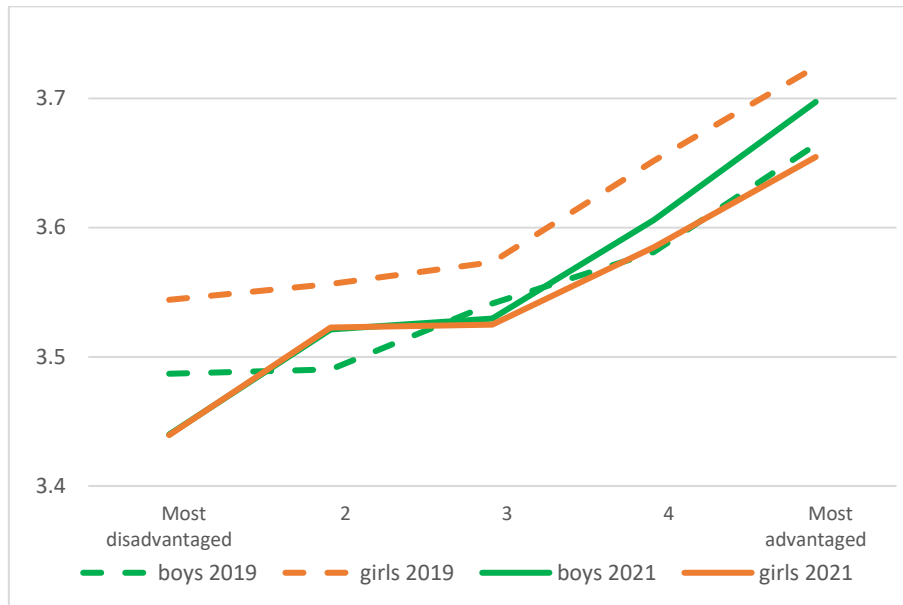


Figure 6. Cognitive engagement in high school by gender and student SEIFA (2019 and 2021)

High school students' emotional engagement with teachers shows less of a social gradient than cognitive engagement, but the gradient here also steepened over time (Figure 7). Again, the decrease in engagement over time was evident for high school girls in all SEIFA quintiles. There was no clear trend for boys over time, although some increase in engagement levels can be observed for socioeconomically advantaged boys.

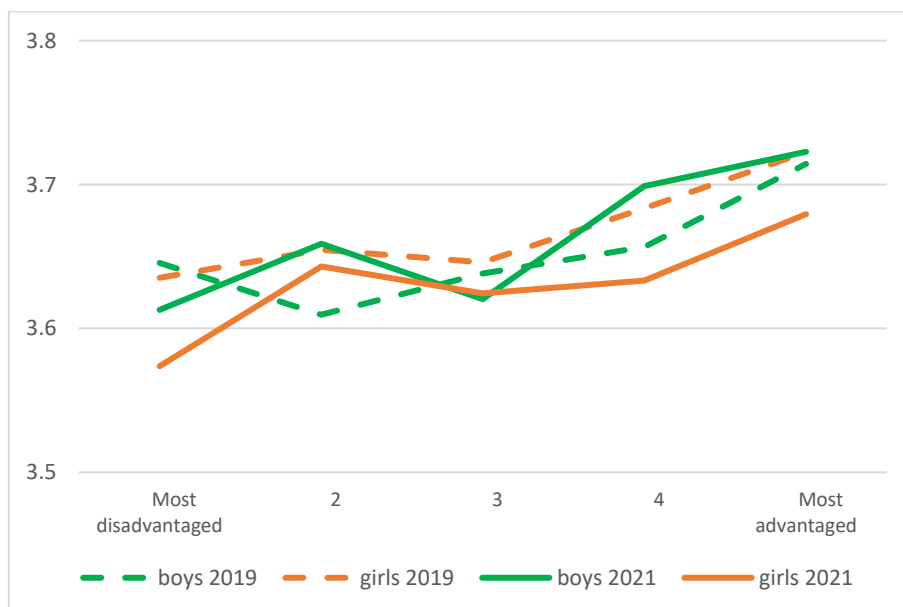


Figure 7. Emotional engagement with teachers in high school by gender and student SEIFA (2019 and 2021)

The social gradient in attendance has been observed previously; Figure 8 below shows that it is worsening over time. Whilst all groups of students showed declines in attendance between 2019

and 2021, the most socioeconomically disadvantaged young people had the largest decreases in attendance over this period (almost three percentage points in attendance rate, compared to one percentage point for the most advantaged students), and in all quintiles, girls declined more over time than boys.



Figure 8. Attendance in high school by gender and student SEIFA (2019 and 2021)

The average levels of attendance and all engagement factors in 2019 and 2021, by gender and student SEIFA, and separately for the primary (grades 4-6) and high school (grades 8-10) cohorts, are provided in Table A6 of the appendix.

Figure 9 shows the social gradients for the various engagement factors (that is, the difference in average levels of engagement between the most and least socioeconomically advantaged students) for girls and boys in primary and high school in 2021.

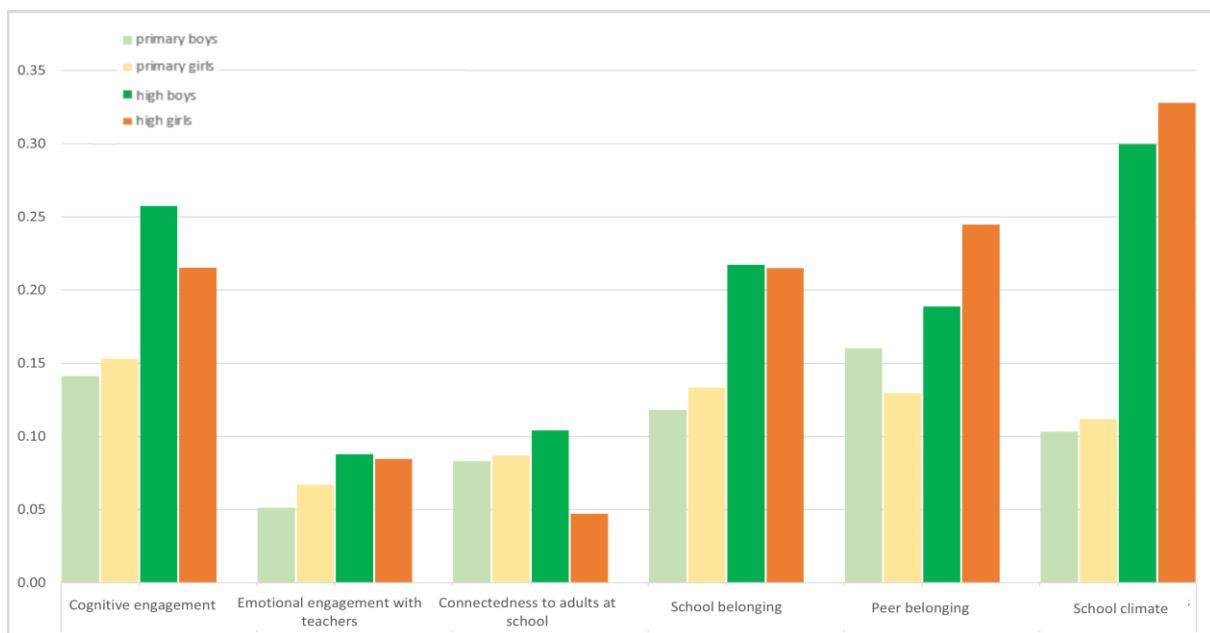


Figure 9. Differences in engagement between the 1st and 5th SEIFA quintiles for boys and girls in primary and high school (2021)

This illustrates that as engagement, on average, decreases between primary and high school, the socioeconomic differences in engagement increase: for almost all engagement factors, the social gradient is noticeably larger in high school than in primary school. For school climate and peer belonging, this effect is more pronounced for girls than boys, whereas for cognitive engagement, the gradient in high school becomes much steeper for boys than girls. The social gradients for emotional engagement with teachers and connectedness with adults at school are much smaller than the other factors, even considering the fact that these are 4- and not 5-point scales, and show smaller differences between primary and high school students.

The average levels of attendance and all engagement factors in 2019 and 2021 for the primary (grades 4-6) and high school (grades 8-10) cohorts, by gender and each of student ARIA, parental education level, and family language background, are provided in Table A7, Table A8, and Table A9 of the appendix respectively. Engagement and attendance are higher on average in students whose family speaks a language other than English, in those with a parent or guardian with a bachelor’s degree, and for students in cities. In each of these cases, the differences between the groups tend to be smaller in primary school.

Moving to the relationships between engagement and attendance, Figure 10 shows, for each engagement factor, the proportions of girls and boys with a high, medium, or low level of engagement who attended school less than 90% of the time in 2021.

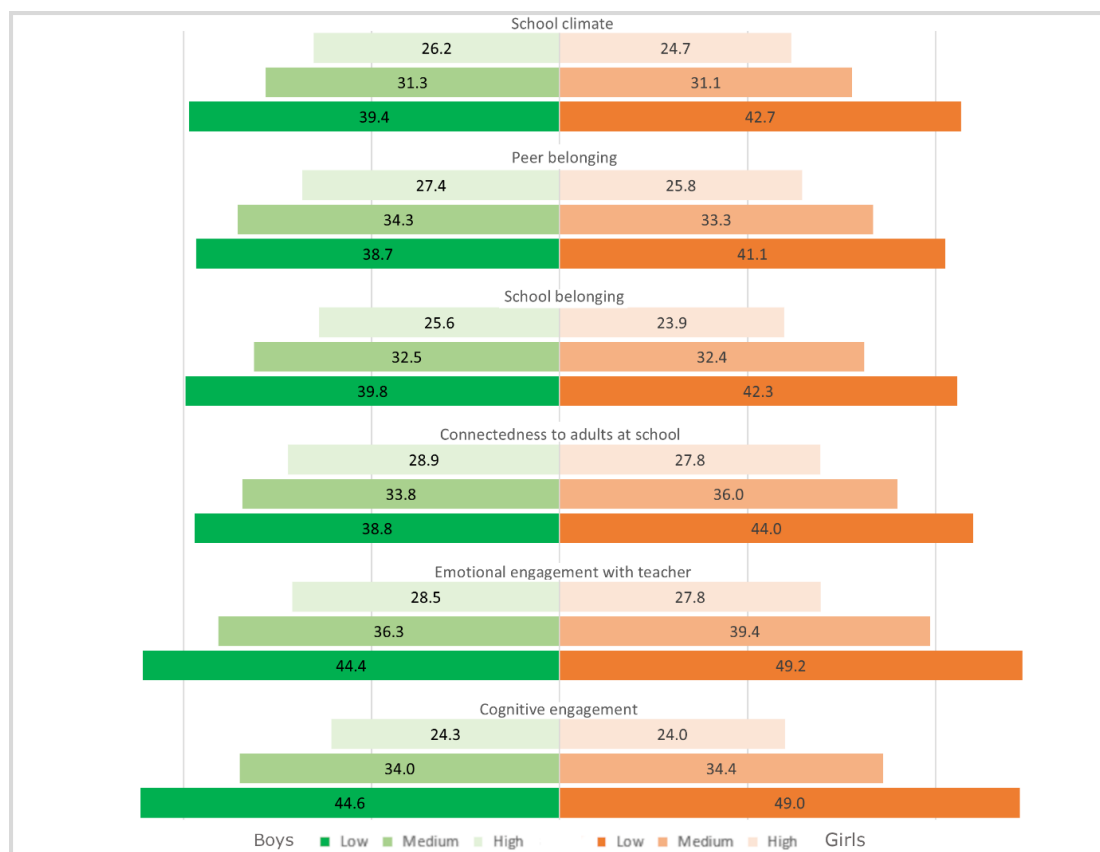


Figure 10. Proportions of girls and boys attending school less than 90% of the time by level of engagement

Those with low levels of engagement, on any of the engagement dimensions, were much less likely to meet the 90% attendance target than those with high levels of engagement, and this was even more the case for girls than boys. Almost half of all girls with low levels of cognitive engagement or

low levels of emotional engagement attended school less than 90% of the time. The number of students with low levels of emotional engagement is relatively low – 2,200, or around three per cent of students, in 2021. However, many more students (almost fourteen per cent of our sample) have low levels of cognitive engagement, and the proportion of students who in 2021 registered a low level of engagement on at least one of the engagement factors we consider is over forty per cent. Around one in five students had low levels on two or more engagement factors (Table A10 in the appendix).

Considering the relationship in the opposite direction, students who attend school less had, on average, lower levels of engagement (Table A11 in the appendix). Additionally, they experienced a much larger drop in engagement over time for all forms of engagement except for connectedness with adults at school (here, they showed a smaller increase in engagement) (Figure 11).

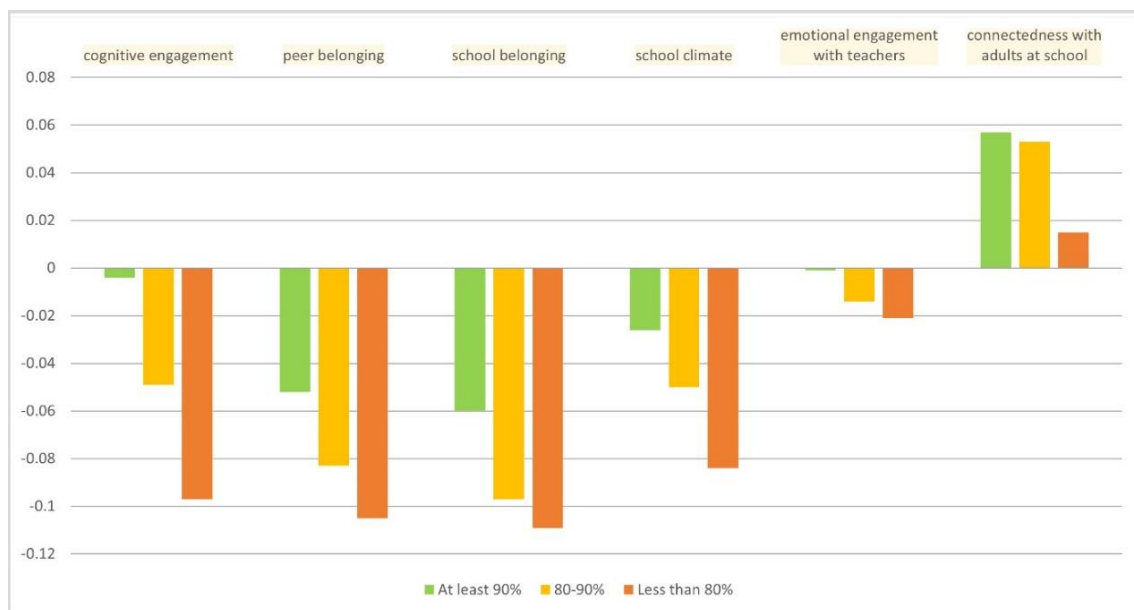


Figure 11. Change in average level of engagement between 2019 and 2021 for students with varying levels of attendance

Regression analyses

The results of the initial OLS regressions for Equation (1) are provided in Table A12 and Table A13 in the appendix. For both boys and girls, all engagement factors had a significant positive relationship with attendance.

The results of the first stage of the 2SLS regressions, predicting engagement using the instrumental variable of engagement (flow) and sociodemographic covariates, are in Table A14 and Table A15 of the appendix. In each model, for both boys and girls, the relationship of flow with the engagement factor was positive and significant. The decreases in levels of engagement levels as a young person progresses through school are shown clearly in the results, with steeper declines in all forms of engagement for girls than boys. The most marked declines for both genders, after accounting for other sociodemographic factors, were in school belonging (0.66 for girls and 0.42 for boys) and school climate (0.74 for girls and 0.53 for boys) between grades 4 and 10.² The other sociodemographic variables had a significant effect in all models, but coefficients were mostly small,

² Note that for boys' school belonging, the largest decline was between grades 4 and 11.

apart from the relationship of parental education with cognitive engagement. This contrasts somewhat with the larger sociodemographic effects observed in the descriptive results. One reason for this is the inclusion of other explanatory variables, and another is that the model estimates the effect size using all cohorts, so that the final average estimated effects are likely to be smaller than some of those observed for particular cohorts (for example, the steeper social gradient for high school students and the steepening of the social gradient over time).

The results of the second stage 2SLS regressions, modelling attendance using the sociodemographic covariates and the predicted values of the engagement factors from the first stage regressions, may be found in Table 3 and Table 4. The value of the Cragg-Donald F-statistic calculated for each model was more than ten times higher than the threshold of 10, affirming the strength and suitability of engagement (flow) as an instrumental variable (Stock & Yogo, 2002). As each engagement factor was modelled separately, slightly different effects for sociodemographic variables are evident. For example, the effects of being in grade 12 for the model on emotional engagement with teachers (model 2) are stronger than in the model with school climate (model 5) (est = -1.921 (SE 0.199) versus est = -1.472 (SE 0.201)) We can interpret this as the impact of socio-demographics on attendance changing with the adjustment of different engagement factors. In general, however most socio-demographic factors have similar results. As suggested within the exploratory analysis, attendance decreases as grade increases, and attendance increases as socioeconomic status (SEIFA) increases. The effects of grade are more profound for girls than for boys, with results suggesting girls are more likely to attend less school as grade increases, however the effects of socioeconomics seem to affect boys more than girls. The models also suggest children from non-English speaking backgrounds have higher attendance rates than children from English speaking backgrounds, however this relationship is stronger for boys than girls (coefficients = 1.0-1.2 for boys, 0.8 – 1.0 for girls). Level of parent or guardian education has a large effect on attendance for both genders.

For results of engagement factors on attendance it is important to highlight the benefit of utilizing the 2SLS approach, that is, point estimates represent a feasible causal effect that can be used to inform policy makers of the possible impacts changes to engagement may have on attendance. With that in mind, we consider the effect size of each engagement factor which indicates the increased rate of attendance per point increase on the engagement factor. For example, holding all other factors equal, a one point increase in cognitive engagement would, on average, increase attendance rates by 1.3 days over a 100-day period. Extrapolating over an entire school year, this would be akin to attending nearly three extra days over an entire school year.

For both girls and boys, the strongest effects were found for emotional engagement with teachers (2.3 for boys, 3.1 for girls) and connectedness to adults at school (2.1 for boys, 2.7 for girls). For all engagement factors the effect sizes were larger for girls than for boys, however, for girls, school climate was particularly impactful (1.6 for boys and 2.4 for girls). Between these three engagement factors, the commonality is that they all relate to the students' interactions with adults influential in their school life. By extrapolation, if we were able to increase any one of these engagement factors by one unit,³ we would feasibly see a 5 day increase in attendance over a school year, or a full weeks' worth of schooling. Thus, these engagement factors may be incredibly powerful predictors of attendance that may be exploited as possible ways to increase attendance.

³ On the Likert scales for these measures, this translates to changing response from "agree" to "strongly agree", for example; see Table A16 in the appendix.

Table 3. Second stage 2SLS regressions: estimated coefficients for equation (1) models predicting boys' attendance

		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Cognitive Engagement		1.266*** (0.0531)					
Emotional Engagement with Teachers			2.235*** (0.0953)				
Peer Belonging				1.516*** (0.0639)			
School Belonging					1.233*** (0.0518)		
Connectedness to Adults at School						2.068*** (0.0888)	
School Climate							1.617*** (0.0691)
School Grade	Grade 4	ref	ref	ref	ref	ref	ref
	Grade 5	-0.284*** (0.0719)	-0.272*** (0.0730)	-0.295*** (0.0727)	-0.203*** (0.0730)	-0.292*** (0.0736)	-0.125* (0.0736)
	Grade 6	-0.565*** (0.0705)	-0.515*** (0.0714)	-0.636*** (0.0712)	-0.468*** (0.0718)	-0.577*** (0.0721)	-0.283*** (0.0733)
	Grade 7	-0.981*** (0.0750)	-0.931*** (0.0763)	-1.140*** (0.0756)	-0.915*** (0.0762)	-1.011*** (0.0767)	-0.671*** (0.0787)
	Grade 8	-0.827*** (0.138)	-0.744*** (0.139)	-0.986*** (0.138)	-0.717*** (0.139)	-0.781*** (0.140)	-0.465*** (0.141)
	Grade 9	-1.629*** (0.144)	-1.510*** (0.146)	-1.862*** (0.144)	-1.548*** (0.145)	-1.577*** (0.146)	-1.170*** (0.149)
	Grade 10	-1.439*** (0.165)	-1.421*** (0.167)	-1.677*** (0.166)	-1.425*** (0.166)	-1.343*** (0.168)	-1.049*** (0.170)
	Grade 11	-1.518*** (0.180)	-1.567*** (0.179)	-1.685*** (0.180)	-1.460*** (0.179)	-1.454*** (0.182)	-1.207*** (0.182)
	Grade 12	-1.582*** (0.199)	-1.921*** (0.199)	-1.802*** (0.199)	-1.619*** (0.199)	-1.750*** (0.201)	-1.472*** (0.201)
Family Language Background	English	ref	ref	ref	ref	ref	ref
	Non-English	1.023*** (0.0588)	1.110*** (0.0589)	1.116*** (0.0592)	1.111*** (0.0590)	1.218*** (0.0595)	1.029*** (0.0596)
SEIFA	1st Quintile	ref	ref	ref	ref	ref	ref
	2nd Quintile	0.542*** (0.125)	0.525*** (0.126)	0.538*** (0.126)	0.496*** (0.126)	0.527*** (0.127)	0.520*** (0.127)
	3rd Quintile	0.764*** (0.118)	0.731*** (0.119)	0.745*** (0.119)	0.710*** (0.119)	0.741*** (0.120)	0.722*** (0.119)
	4th Quintile	0.892*** (0.113)	0.875*** (0.115)	0.918*** (0.114)	0.882*** (0.114)	0.889*** (0.116)	0.920*** (0.115)
	5th Quintile	1.103*** (0.122)	1.092*** (0.123)	1.085*** (0.123)	1.068*** (0.123)	1.089*** (0.124)	1.092*** (0.123)
Parent/Guardian Education	Other	ref	ref	ref	ref	ref	ref
	Bachelor Degree	1.626*** (0.0456)	1.684*** (0.0459)	1.735*** (0.0458)	1.703*** (0.0457)	1.673*** (0.0463)	1.797*** (0.0460)
Constant		90.38*** (0.694)	88.26*** (1.368)	88.46*** (1.105)	90.39*** (1.169)	89.45*** (1.436)	89.11*** (1.381)
<i>N</i>		156454	154970	155938	154357	154754	155019
<i>R</i> ²		0.110	0.098	0.096	0.101	0.084	0.089

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4. Second stage 2SLS regressions: estimated coefficients for equation (1) models predicting girls' attendance

		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Cognitive Engagement		1.683*** (0.0534)					
Emotional Engagement with Teachers			3.094*** (0.101)				
Peer Belonging				1.996*** (0.0642)			
School Belonging					1.632*** (0.0527)		
Connectedness to Adults at School						2.671*** (0.0873)	
School Climate							2.348*** (0.0769)
School Grade	Grade 4	ref	ref	ref	ref	ref	ref
	Grade 5	0.00454 (0.0710)	0.0429 (0.0725)	0.00336 (0.0722)	0.140* (0.0728)	-0.0356 (0.0734)	0.262*** (0.0743)
	Grade 6	-0.138* (0.0707)	-0.0258 (0.0724)	-0.185*** (0.0714)	0.0855 (0.0730)	-0.172** (0.0730)	0.291*** (0.0754)
	Grade 7	-0.471*** (0.0749)	-0.280*** (0.0772)	-0.614*** (0.0754)	-0.199** (0.0776)	-0.422*** (0.0774)	0.0901 (0.0816)
	Grade 8	-0.437*** (0.140)	-0.158 (0.145)	-0.644*** (0.141)	-0.0473 (0.145)	-0.252* (0.146)	0.326** (0.151)
	Grade 9	-1.747*** (0.146)	-1.351*** (0.152)	-1.937*** (0.147)	-1.242*** (0.152)	-1.563*** (0.151)	-0.651*** (0.161)
	Grade 10	-2.416*** (0.175)	-2.096*** (0.180)	-2.633*** (0.175)	-2.010*** (0.180)	-2.244*** (0.180)	-1.332*** (0.188)
	Grade 11	-2.928*** (0.191)	-2.865*** (0.194)	-3.205*** (0.191)	-2.699*** (0.194)	-2.938*** (0.195)	-2.133*** (0.202)
	Grade 12	-2.902*** (0.198)	-3.081*** (0.200)	-3.050*** (0.199)	-2.670*** (0.201)	-3.101*** (0.201)	-2.251*** (0.206)
Family Language Background	English	ref	ref	ref	ref	ref	ref
	Non-English	0.835*** (0.0602)	0.893*** (0.0611)	0.891*** (0.0610)	0.898*** (0.0610)	1.053*** (0.0617)	0.791*** (0.0621)
SEIFA	1 st Quintile	ref	ref	ref	ref	ref	ref
	2 nd Quintile	0.557*** (0.123)	0.521*** (0.125)	0.513*** (0.125)	0.536*** (0.125)	0.469*** (0.126)	0.564*** (0.126)
	3 rd Quintile	0.497*** (0.117)	0.481*** (0.119)	0.421*** (0.119)	0.468*** (0.119)	0.392*** (0.120)	0.511*** (0.120)
	4 th Quintile	0.772*** (0.114)	0.775*** (0.116)	0.697*** (0.116)	0.761*** (0.116)	0.725*** (0.117)	0.812*** (0.117)
	5 th Quintile	0.924*** (0.123)	0.911*** (0.124)	0.828*** (0.124)	0.907*** (0.124)	0.862*** (0.126)	0.966*** (0.125)
Parent/Guardian Education	Other	ref	ref	ref	ref	ref	ref
	Bachelor Degree	1.406*** (0.0468)	1.506*** (0.0471)	1.546*** (0.0471)	1.496*** (0.0469)	1.437*** (0.0481)	1.608*** (0.0475)
Constant		86.31*** (2.587)	82.60*** (2.920)	83.96*** (3.030)	86.14*** (2.361)	84.65*** (2.939)	82.56*** (2.822)
N		150032	148638	149486	148308	148357	148721
R ²		0.116	0.099	0.097	0.104	0.079	0.080

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Discussion

It is well-established that young people's engagement with school is important to their wellbeing, to their learning, and to their long-term outcomes. For young people to really thrive at school, they need to be both present and engaged. The results of this report show that if we can increase engagement with school, then improved attendance will be one of the many positive effects.

The current project is novel in both scale (over 330,000 observations of students in grades 4 through 12, over six calendar years) and its use of causal inference techniques, enabling a causal relationship between several distinct aspects of engagement and student attendance to be determined. It is an important addition to recent Australian research examining the complex interplay between engagement, attendance, and student outcomes. These include an influential large-scale study, completed almost a decade ago, establishing a strong relationship between attendance and academic outcomes (Hancock et al., 2013) and another South Australian DfE report utilising the WEC that found strong associations between aspects of engagement and academic outcomes (Boulton et al., 2022). Analyses of the drivers and outcomes of school engagement using Victorian data (Centre for Adolescent Health, 2018) and the relationships between engagement and attendance for NSW students (Centre for Education Statistics and Evaluation, 2022) have yielded interesting results but utilised much smaller samples (1,200 and 25,000, respectively) over shorter time periods (5 years and 2 years, respectively) and have not examined causality.

We briefly recap our key results. The exploratory descriptive analysis found clear differences between girls and boys in the trajectories of engagement and attendance over the course of schooling, and over time. Socioeconomic advantage is associated with higher attendance and higher levels of engagement, as has been observed previously. The social gradient is markedly steeper for some types of engagement, such as cognitive engagement, and flatter for others, such as emotional engagement with teachers. The relationships of socioeconomic advantage with engagement differ by gender and are less evident in primary school than high school. Disadvantaged students tended to decrease more in engagement over time than advantaged students, although much more so for girls than boys, leading to a steepening of the social gradients over time.

The regression analysis found all aspects of engagement to have a significant positive influence on attendance, after accounting for the effects of other factors, with larger effect sizes for girls than boys. Emotional engagement with teachers and connectedness to adults at school had the largest impacts. For example, holding all other factors constant, a one unit increase in emotional engagement with teachers (on the 4-point Likert scale used for this construct, this is equivalent to changing response from "disagree" to "agree" with statements such as "most of my teachers treat me fairly" and "most of my teachers really listen to what I have to say") would result in six less days of absence in a school year for girls (coefficient 3.094) and more than four days over the year for boys (coefficient 2.235). If the engagement of students with the lowest levels of emotional engagement with their teachers could be improved to the highest possible levels, this could result in an attendance increase of over 13 days in a year for boys and over 18 days per year for girls, that is, more than 2 school weeks and almost an entire month, respectively.

Students' perceptions of the school climate also had a strong effect on attendance. Recalling that in the WEC, the school climate construct measures students perceptions of how teachers treat students and how students treat one another, a one unit increase on the five point Likert scale for this construct is equivalent to a change from "disagree" to "neutral" in response to statements such as "people care about each other in this school" and would result in an extra four days attendance

for girls each school year (coefficient 2.348) and a three-day increase for boys each year (coefficient 1.617). Noting the difference in scales between this construct and the previous, a student moving from the lowest score of 1 to the highest score of 5 in their perceptions of the school climate could result in an attendance increase of almost 13 days in a year for boys and almost 19 days per year for girls.

Cognitive engagement, peer belonging, and school belonging also all showed strong influence on attendance, greater for girls than boys, with one unit increases resulting in 3-4 extra days attendance per year for girls and 2-3 days per year for boys. The decrease in attendance over the course of schooling observed in the descriptive analyses was clearly evident in the regression analysis, with again larger effects for girls than boys. Holding all other factors constant, a girl in grade 12 would be attending up to 6 days less per year in grade 12 than she was in grade 4, and a boy up to 4 days less.

The regression analyses confirmed the strong relationship, as observed in the descriptive analyses, between attendance and socioeconomic advantage. In this case, however, the effect was more pronounced for boys than girls. On average, students in the highest SEIFA quintile attend school almost two days per year more than those in the lowest quintile. A noteworthy caveat of linear regression models is estimated effects are on an average level; in reality, social gradients are much steeper depending on grade level and we would expect the effect size to likely be larger in high school. Parental education, whilst related to socioeconomic status, had an independently strong effect: young people with at least one parent or guardian with a bachelor's degree are likely to attend school at least three days more each year than those whose parents are not university educated. As with socioeconomic advantage, the effect of parental education on attendance was larger for boys than girls.

The smaller influence of cognitive engagement than some of the other factors on attendance is interesting, especially considering the strong relationship of cognitive engagement with other outcomes such as academic achievement (Boulton et al., 2022). The connections between cognitive engagement and family background observed in the earlier analyses may explain some of this, in that, in the regression equations, when these sociodemographic factors are held constant, the variation in attendance due to cognitive engagement alone is smaller. It is also possible that attendance and cognitive engagement have more of a reciprocal effect than some of the other engagement factors. When a student regularly misses school, they are likely to fall behind on classwork, and loss of learning has been observed to have a bidirectional relationship with engagement (Centre for Adolescent Health, 2018).

As noted above, the three engagement factors with the most powerful effect on attendance relate to young people's interactions with teachers, with other adults, and with other students in their school. In particular, items in these domains gauge students' perceptions of whether or not teachers treat them fairly, listen to them, and care about them (the full listing of items is provided in

Table A16 of the appendix). This is in accordance with recent research, as mentioned in the introduction, that found students' positive emotional engagement with teachers and perceptions of fairness, equity and autonomy at school were strongly associated with reduced absenteeism (Daily et al., 2020). Similarly, the recent NSW study that found behavioural engagement strongly predicted attendance for high school students found, further, that teachers indirectly influenced attendance through their influence on student engagement: "Students who feel they are being supported at school and who feel safe and fairly treated in the classroom have a higher sense of belonging to school and are more likely to attend." (Centre for Education Statistics and Evaluation, 2022).

Since engagement is accepted to be malleable (Fredricks et al., 2004), action can be taken to increase young people's engagement with school (and their teachers' ability to facilitate this), and this will likely result in improvement in attendance rates. Based on the influential factors identified in this report, we recommend a focus on developing connections between students and teachers, on ensuring students feel heard, and on respectful relationships in the school environment more generally. A relevant framework to guide further research into potential action will be self-determination theory (Ryan & Deci, 2020), which identifies autonomy, competence and relatedness as the basic psychological needs that form the basis for engagement and wellbeing. The themes of agency, autonomy and competence also align and connect with existing DfE work in the areas of self-regulated learning and metacognition, and the DfE strategy of learner agency.

To conclude, we mention some of the limitations of this work and some directions for future research. Firstly, our analyses did not include measures to address potential bias in our sample stemming from WEC non-responders. Although addressing WEC sample bias was considered and determined to not be of high priority in a recent DfE report (Gregory & Monroy, 2022), we observed quite large differences in attendance rates between those who did and did not sit the WEC. This is likely to have been related to the lower representation of socioeconomically disadvantaged and senior secondary students in our sample than in the population, however this will be further investigated in future work.

Our sample included students attending South Australian government schools over a continuous six year period, and although we conducted some descriptive analysis of changes in engagement and attendance over time, and included year effects in the regression modelling, we did not perform any substantial longitudinal analyses. Longitudinal analysis will be included in future work, particularly once data from the 2022 and 2023 Wellbeing and Engagement collections become available. Subgroup analyses in the current work were also restricted to descriptive analyses, and further investigation of subgroups, with the aim of identifying groups who may particularly benefit from interventions, is another future goal. Complementing this, trajectory analysis has the potential to identify characteristics of schools and students who, counter to the general trend, exhibit stable or increasing engagement. Finally, the relationships between the engagement factors, along with other constructs measured in the WEC such as perseverance, self-efficacy and (in the future) autonomy, merit further investigation. This could potentially form part of further research into practical actions to increase young people's engagement with school which, as a focus of DfE strategy and a strong driver of attendance, will surely be undertaken as a priority.

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Appendix

Table A1. Characteristics of all SA Government school students compared to those included in and excluded from sample (2021)

	All students	Eligible sample	Did not sit WEC	No attendance data
N	117,935	75,648	32,608	15,760
(As percentage of all students)	(100%)	(64.1%)	(27.6%)	(13.4%)
Student Grade				
4	14,394 (12.2%)	10,443 (13.8%)	2,701 (8.3%)	1,612 (10.2%)
5	13,815 (11.7%)	10,356 (13.7%)	2,339 (7.2%)	1,433 (9.1%)
6	14,037 (11.9%)	10,541 (13.9%)	2,291 (7.0%)	1,458 (9.3%)
7	13,028 (11.0%)	9,501 (12.6%)	2,408 (7.4%)	1,426 (9.0%)
8	12,521 (10.6%)	8,867 (11.7%)	2,687 (8.2%)	1,321 (8.4%)
9	12,740 (10.8%)	7,936 (10.5%)	3,827 (11.7%)	1,554 (9.9%)
10	12,487 (10.6%)	7,511 (9.9%)	4,227 (13.0%)	1,322 (8.4%)
11	13,095 (11.1%)	5,922 (7.8%)	5,894 (18.1%)	2,933 (18.6%)
12	11,818 (10.0%)	4,571 (6.0%)	6,234 (19.1%)	2,701 (17.1%)
Student Gender				
Boy	60,904 (51.6%)	38,597 (51.0%)	17,490 (53.6%)	7,943 (50.4%)
Girl	55,791 (47.3%)	35,945 (47.5%)	15,118 (46.4%)	7,683 (48.8%)
Other	1,240 (1.1%)	1,106 (1.5%)		134 (0.9%)
Student SEIFA				
1 (Most disadvantaged)	34,162 (29.2%)	19,696 (26.1%)	11,897 (37.1%)	4,704 (30.1%)
2	18,962 (16.2%)	11,812 (15.6%)	5,577 (17.4%)	2,568 (16.4%)
3	18,735 (16.0%)	11,975 (15.9%)	5,186 (16.2%)	2,518 (16.1%)
4	22,976 (19.6%)	15,866 (21.0%)	5,115 (16.0%)	2,990 (19.1%)
5 (Most advantaged)	22,358 (19.1%)	16,150 (21.4%)	4,269 (13.3%)	2,843 (18.2%)
School IED				
1 (Most disadvantaged)	3,720 (3.2%)	1,861 (2.5%)	1,696 (5.2%)	403 (2.6%)
2	20,145 (17.1%)	11,346 (15.0%)	7,201 (22.1%)	3,006 (19.1%)
3	14,862 (12.6%)	7,665 (10.1%)	6,061 (18.6%)	2,416 (15.3%)
4	14,099 (12.0%)	8,810 (11.6%)	4,025 (12.3%)	1,821 (11.6%)
5	24,119 (20.5%)	15,359 (20.3%)	6,762 (20.7%)	3,620 (23.0%)
6	24,128 (20.5%)	17,470 (23.1%)	4,639 (14.2%)	2,671 (16.9%)
7 (Most advantaged)	16,862 (14.3%)	13,137 (17.4%)	2,224 (6.8%)	1,823 (11.6%)
Student ARIA				
Major Cities	81,460 (69.5%)	53,617 (71.0%)	21,054 (65.7%)	10,920 (69.9%)
Inner Regional	17,001 (14.5%)	10,673 (14.1%)	5,037 (15.7%)	2,159 (13.8%)
Outer Regional	14,199 (12.1%)	8,587 (11.4%)	4,432 (13.8%)	1,928 (12.3%)
Remote	3,452 (2.9%)	2,216 (2.9%)	898 (2.8%)	493 (3.2%)
Very Remote	1,098 (0.9%)	413 (0.5%)	633 (2.0%)	129 (0.8%)
Student language background				
English only	89,258 (75.7%)	56,633 (74.9%)	25,497 (78.2%)	11,874 (75.3%)
Non-English	28,677 (24.3%)	19,015 (25.1%)	7,111 (21.8%)	3,886 (24.7%)
Student - Highest education level of parents/guardians				
Other	78,240 (68.6%)	47,900 (65.1%)	24,173 (77.6%)	10,471 (69.6%)
Bachelor degree or higher	35,892 (31.4%)	25,726 (34.9%)	6,989 (22.4%)	4,564 (30.4%)
Attendance rate	87.306 (15.529)	90.495 (10.261)	78.214 (22.737)	
Student attendance level				
At least 90%	62,308 (61.0%)	51,432 (68.0%)	10,876 (41.0%)	-
80-90%	21,794 (21.3%)	15,761 (20.8%)	6,033 (22.7%)	-
Less than 80%	18,073 (17.7%)	8,455 (11.2%)	9,618 (36.3%)	-

Table A2. Numbers and proportions of students with low, medium, and high levels of engagement and attendance, and mean engagement and attendance of population, sample, and those without attendance data (2021)

	All students	Eligible sample	No attendance data
N	117,935	75,648	15,760
(As percentage of all students)	(100%)	(64.1%)	(13.4%)
Cognitive engagement			
Low	11,158 (13.7%)	9,937 (13.8%)	1,221 (13.3%)
Medium	31,615 (38.9%)	27,967 (38.8%)	3,648 (39.9%)
High	38,405 (47.3%)	34,123 (47.4%)	4,282 (46.8%)
Mean (SD)	3.731 (0.823)	3.732 (0.825)	3.727 (0.810)
Emotional engagement with teacher			
Low	2,502 (3.0%)	2,228 (3.1%)	274 (2.9%)
Medium	22,245 (27.1%)	19,783 (27.1%)	2,462 (26.5%)
High	57,487 (69.9%)	50,929 (69.8%)	6,558 (70.6%)
Mean (SD)	3.077 (0.570)	3.076 (0.570)	3.083 (0.566)
Connectedness to adults at school			
Low	7,392 (9.0%)	6,538 (9.0%)	854 (9.2%)
Medium	23,095 (28.1%)	20,534 (28.2%)	2,561 (27.6%)
High	51,693 (62.9%)	45,831 (62.9%)	5,862 (63.2%)
Mean (SD)	2.979 (0.823)	2.979 (0.822)	2.977 (0.824)
School belonging			
Low	18,481 (22.7%)	16,452 (22.8%)	2,029 (22.1%)
Medium	29,137 (35.8%)	25,831 (35.7%)	3,306 (36.0%)
High	33,842 (41.5%)	29,992 (41.5%)	3,850 (41.9%)
Mean (SD)	3.410 (1.055)	3.410 (1.055)	3.417 (1.050)
Peer belonging			
Low	13,429 (16.4%)	11,877 (16.4%)	1,552 (16.9%)
Medium	26,976 (33.0%)	23,921 (33.0%)	3,055 (33.2%)
High	41,254 (50.5%)	36,658 (50.6%)	4,596 (49.9%)
Mean (SD)	3.674 (0.937)	3.677 (0.936)	3.648 (0.944)
School climate			
Low	17,448 (21.3%)	15,501 (21.3%)	1,947 (21.0%)
Medium	35,467 (43.2%)	31,539 (43.3%)	3,928 (42.4%)
High	29,174 (35.5%)	25,781 (35.4%)	3,393 (36.6%)
Mean (SD)	3.433 (0.889)	3.430 (0.889)	3.452 (0.885)
Engagement (flow)			
Low	25,823 (31.7%)	22,899 (31.7%)	2,924 (31.9%)
Medium	34,583 (42.5%)	30,621 (42.4%)	3,962 (43.2%)
High	20,981 (25.8%)	18,687 (25.9%)	2,294 (25.0%)
Mean (SD)	3.238 (0.906)	3.239 (0.908)	3.228 (0.893)

Table A3. Numbers and proportions of students with low, medium, and high levels of engagement and attendance, and mean engagement and attendance of sample (2016-2021)

	2016	2017	2018	2019	2020	2021	Total
N	31,937 (9.5%)	47,954 (14.2%)	54,992 (16.3%)	68,621 (20.4%)	56,516 (16.8%)	76,655 (22.8%)	336,675 (100.0%)
Cognitive engagement							
Low	4,113 (13.3%)	4,981 (10.9%)	6,957 (13.2%)	8,373 (13.1%)	7,762 (14.7%)	10,087 (13.8%)	42,273 (13.2%)
Medium	13,050 (42.1%)	16,439 (36.0%)	19,094 (36.1%)	24,004 (37.7%)	20,930 (39.6%)	28,375 (38.9%)	121,892 (38.2%)
High	13,854 (44.7%)	24,278 (53.1%)	26,771 (50.7%)	31,325 (49.2%)	24,133 (45.7%)	34,523 (47.3%)	154,884 (48.5%)
Mean (SD)	3.705 (0.796)	3.855 (0.808)	3.787 (0.824)	3.762 (0.825)	3.698 (0.819)	3.731 (0.825)	3.756 (0.820)
Emotional engagement with teacher							
Low	1,600 (5.1%)	1,888 (4.1%)	1,768 (3.3%)	1,961 (3.1%)	1,546 (3.0%)	2,256 (3.1%)	11,019 (3.4%)
Medium	9,590 (30.7%)	11,789 (25.7%)	13,670 (25.6%)	16,149 (25.3%)	14,128 (27.1%)	20,030 (27.1%)	85,356 (26.7%)
High	20,004 (64.1%)	32,278 (70.2%)	37,862 (71.0%)	45,621 (71.6%)	36,455 (69.9%)	51,623 (69.8%)	223,843 (69.9%)
Mean (SD)	2.992 (0.616)	3.098 (0.615)	3.091 (0.582)	3.087 (0.570)	3.061 (0.558)	3.076 (0.570)	3.073 (0.582)
Connectedness to adults at school							
Low	3,878 (12.4%)	4,812 (10.4%)	5,279 (9.9%)	6,250 (9.8%)	4,681 (8.9%)	6,633 (9.0%)	31,533 (9.8%)
Medium	10,794 (34.4%)	14,354 (30.9%)	15,763 (29.5%)	19,205 (30.2%)	15,675 (30.0%)	20,820 (28.2%)	96,611 (30.1%)
High	16,668 (53.2%)	27,220 (58.7%)	32,452 (60.7%)	38,214 (60.0%)	31,978 (61.1%)	46,421 (62.8%)	192,953 (60.1%)
Mean (SD)	2.812 (0.854)	2.924 (0.846)	2.946 (0.831)	2.931 (0.832)	2.951 (0.812)	2.978 (0.822)	2.935 (0.832)
School belonging							
Low	8,105 (26.2%)	10,341 (22.7%)	10,877 (20.7%)	12,916 (20.5%)	12,111 (23.4%)	16,672 (22.8%)	71,022 (22.4%)
Medium	9,564 (30.9%)	12,212 (26.8%)	17,150 (32.6%)	21,708 (34.4%)	18,434 (35.6%)	26,216 (35.8%)	105,284 (33.2%)
High	13,301 (42.9%)	23,088 (50.6%)	24,523 (46.7%)	28,531 (45.2%)	21,165 (40.9%)	30,350 (41.4%)	140,958 (44.4%)
Mean (SD)	3.391 (1.154)	3.565 (1.174)	3.513 (1.070)	3.491 (1.053)	3.392 (1.049)	3.408 (1.054)	3.460 (1.085)
Peer belonging							
Low	4,980 (16.0%)	6,838 (14.9%)	7,380 (13.9%)	9,408 (14.6%)	8,708 (16.5%)	12,063 (16.4%)	49,377 (15.4%)
Medium	7,786 (25.0%)	10,540 (22.9%)	15,288 (28.8%)	19,804 (30.7%)	17,380 (32.8%)	24,265 (33.0%)	95,063 (29.6%)
High	18,403 (59.0%)	28,636 (62.2%)	30,340 (57.2%)	35,328 (54.7%)	26,843 (50.7%)	37,093 (50.5%)	176,643 (55.0%)
Mean (SD)	3.828 (1.025)	3.901 (1.011)	3.798 (0.925)	3.746 (0.933)	3.673 (0.930)	3.675 (0.937)	3.757 (0.956)
School climate							
Low	8,717 (27.9%)	10,770 (23.3%)	10,853 (20.4%)	12,694 (19.9%)	11,009 (21.1%)	15,666 (21.2%)	69,709 (21.7%)
Medium	11,394 (36.4%)	14,902 (32.3%)	22,413 (42.1%)	27,131 (42.5%)	23,251 (44.5%)	31,993 (43.4%)	131,084 (40.9%)
High	11,150 (35.7%)	20,525 (44.4%)	19,951 (37.5%)	24,014 (37.6%)	17,953 (34.4%)	26,132 (35.4%)	119,725 (37.4%)
Mean (SD)	3.352 (1.006)	3.536 (1.018)	3.479 (0.891)	3.475 (0.888)	3.426 (0.862)	3.431 (0.889)	3.454 (0.918)
Engagement (flow)							
Low	15,007 (48.4%)	19,887 (43.6%)	17,427 (33.0%)	20,181 (31.7%)	18,056 (34.1%)	23,244 (31.8%)	113,802 (35.7%)
Medium	9,228 (29.8%)	13,621 (29.9%)	21,455 (40.6%)	26,977 (42.4%)	22,379 (42.3%)	31,026 (42.4%)	124,686 (39.1%)
High	6,771 (21.8%)	12,068 (26.5%)	13,988 (26.5%)	16,413 (25.8%)	12,521 (23.6%)	18,897 (25.8%)	80,658 (25.3%)
Mean (SD)	2.958 (1.023)	3.092 (1.044)	3.240 (0.925)	3.234 (0.908)	3.182 (0.901)	3.238 (0.908)	3.180 (0.946)
Attendance Rate (T1-T3)							
At least 90%	23,024 (72.1%)	35,366 (73.7%)	41,063 (74.7%)	48,265 (70.3%)	35,329 (62.5%)	52,118 (68.0%)	235,165 (69.8%)
80-90%	6,398 (20.0%)	9,414 (19.6%)	10,272 (18.7%)	13,959 (20.3%)	14,853 (26.3%)	15,958 (20.8%)	70,854 (21.0%)
Less than 80%	2,515 (7.9%)	3,174 (6.6%)	3,657 (6.7%)	6,397 (9.3%)	6,334 (11.2%)	8,579 (11.2%)	30,656 (9.1%)
Mean (SD)	91.601 (8.473)	92.046 (7.981)	92.216 (7.931)	91.076 (9.513)	89.996 (9.222)	90.490 (10.279)	91.136 (9.142)

Table A4. Demographic characteristics of sample by level of attendance (2021)

		Attendance			Total
		At least 90%	80-90%	Less than 80%	
N		52,118 (68.0%)	15,958 (20.8%)	8,579 (11.2%)	76,655 (100.0%)
Student Grade					
	4	7,993 (15.3%)	1,856 (11.6%)	690 (8.0%)	10,539 (13.8%)
	5	7,777 (14.9%)	1,915 (12.0%)	745 (8.7%)	10,437 (13.6%)
	6	7,813 (15.0%)	1,987 (12.5%)	808 (9.4%)	10,608 (13.8%)
	7	6,545 (12.6%)	2,031 (12.7%)	1,039 (12.1%)	9,615 (12.5%)
	8	6,242 (12.0%)	1,877 (11.8%)	1,064 (12.4%)	9,183 (12.0%)
	9	4,897 (9.4%)	1,896 (11.9%)	1,231 (14.4%)	8,024 (10.5%)
	10	4,598 (8.8%)	1,822 (11.4%)	1,187 (13.8%)	7,607 (9.9%)
	11	3,537 (6.8%)	1,443 (9.0%)	998 (11.6%)	5,978 (7.8%)
	12	2,708 (5.2%)	1,127 (7.1%)	815 (9.5%)	4,650 (6.1%)
Student - Gender					
	Boy	26,681 (51.2%)	8,136 (51.0%)	4,264 (49.7%)	39,081 (51.0%)
	Girl	24,821 (47.7%)	7,501 (47.0%)	4,093 (47.7%)	36,415 (47.5%)
	Other	581 (1.1%)	315 (2.0%)	219 (2.6%)	1,115 (1.5%)
Student - SEIFA Quintile					
	1 (Most disadvantaged)	11,432 (22.3%)	4,782 (30.4%)	3,482 (41.3%)	19,696 (26.1%)
	2	7,541 (14.7%)	2,744 (17.4%)	1,527 (18.1%)	11,812 (15.6%)
	3	8,197 (16.0%)	2,516 (16.0%)	1,262 (15.0%)	11,975 (15.9%)
	4	11,417 (22.2%)	3,166 (20.1%)	1,283 (15.2%)	15,866 (21.0%)
	5 (Most advantaged)	12,742 (24.8%)	2,523 (16.0%)	885 (10.5%)	16,150 (21.4%)
School_IED					
	1	846 (1.6%)	451 (2.8%)	595 (6.9%)	1,892 (2.5%)
	2	6,250 (12.0%)	2,916 (18.3%)	2,330 (27.2%)	11,496 (15.0%)
	3	4,720 (9.1%)	1,856 (11.6%)	1,231 (14.4%)	7,807 (10.2%)
	4	5,861 (11.2%)	2,067 (13.0%)	1,055 (12.3%)	8,983 (11.7%)
	5	10,720 (20.6%)	3,336 (20.9%)	1,488 (17.3%)	15,544 (20.3%)
	6	12,945 (24.8%)	3,331 (20.9%)	1,372 (16.0%)	17,648 (23.0%)
	7	10,774 (20.7%)	2,001 (12.5%)	507 (5.9%)	13,282 (17.3%)
Student (ARIA)					
	Major Cities	37,533 (73.1%)	10,502 (66.8%)	5,582 (66.1%)	53,617 (71.0%)
	Inner Regional	6,983 (13.6%)	2,487 (15.8%)	1,203 (14.3%)	10,673 (14.1%)
	Outer Regional	5,288 (10.3%)	2,037 (12.9%)	1,262 (15.0%)	8,587 (11.4%)
	Remote	1,313 (2.6%)	594 (3.8%)	309 (3.7%)	2,216 (2.9%)
	Very Remote	216 (0.4%)	113 (0.7%)	84 (1.0%)	413 (0.5%)
Student - language background					
	English only	36,864 (71.7%)	12,798 (81.2%)	6,971 (82.4%)	56,633 (74.9%)
	Non-English	14,568 (28.3%)	2,963 (18.8%)	1,484 (17.6%)	19,015 (25.1%)
Student - Highest education level of parents/guardians					
	Other	29,546 (58.9%)	11,481 (74.6%)	7,032 (84.8%)	48,059 (65.1%)
	Bachelor degree or higher	20,591 (41.1%)	3,905 (25.4%)	1,258 (15.2%)	25,754 (34.9%)

Table A5. Average attendance and engagement by student grade and gender (2019 and 2021)

Attendance rate									
Grade	4	5	6	7	8	9	10	11	12
2019									
Boys	92.23	91.78	91.32	90.73	90.94	90.37	90.58	89.87	90.34
Girls	92.50	92.33	92.12	91.44	91.43	90.21	89.32	88.61	89.21
2021									
Boys	92.47	91.93	91.53	90.32	90.28	88.94	89.34	89.13	89.29
Girls	92.48	92.25	92.26	90.82	90.60	88.60	88.14	87.56	87.65
Cognitive engagement									
Grade	4	5	6	7	8	9	10	11	12
2019									
Boys	3.90	3.90	3.84	3.79	3.64	3.53	3.48	3.46	3.48
Girls	4.09	4.07	4.00	3.90	3.70	3.59	3.52	3.53	3.55
2021									
Boys	3.92	3.86	3.83	3.74	3.64	3.53	3.48	3.49	3.56
Girls	4.09	4.04	3.94	3.82	3.65	3.49	3.48	3.49	3.61
Emotional engagement with teachers									
Grade	4	5	6	7	8	9	10	11	12
2019									
Boys	3.18	3.18	3.15	3.10	2.99	2.89	2.89	2.94	3.07
Girls	3.31	3.30	3.25	3.17	3.02	2.90	2.88	2.97	3.08
2021									
Boys	3.20	3.17	3.14	3.07	2.99	2.90	2.89	2.96	3.11
Girls	3.33	3.29	3.24	3.13	2.98	2.85	2.87	2.94	3.11
Connectedness to adults at school									
Grade	4	5	6	7	8	9	10	11	12
2019									
Boys	3.04	3.07	3.05	3.00	2.81	2.70	2.67	2.68	2.83
Girls	3.19	3.21	3.18	3.08	2.78	2.68	2.67	2.74	2.81
2021									
Boys	3.10	3.09	3.08	3.04	2.88	2.78	2.76	2.77	2.92
Girls	3.24	3.25	3.20	3.09	2.81	2.72	2.75	2.79	2.96
School belonging									
Grade	4	5	6	7	8	9	10	11	12
2019									
Boys	3.79	3.74	3.65	3.61	3.40	3.31	3.26	3.25	3.27
Girls	3.89	3.80	3.68	3.56	3.27	3.09	3.04	3.14	3.16
2021									
Boys	3.75	3.62	3.57	3.50	3.35	3.23	3.20	3.23	3.37
Girls	3.88	3.71	3.59	3.41	3.18	2.96	2.96	3.06	3.24
Peer belonging									
Grade	4	5	6	7	8	9	10	11	12
2019									
Boys	3.89	3.91	3.90	3.90	3.78	3.77	3.67	3.59	3.60
Girls	3.85	3.82	3.80	3.75	3.64	3.55	3.49	3.46	3.43
2021									
Boys	3.85	3.85	3.82	3.80	3.75	3.69	3.63	3.59	3.67
Girls	3.80	3.74	3.67	3.63	3.57	3.47	3.41	3.42	3.46
School climate									
Grade	4	5	6	7	8	9	10	11	12
2019									
Boys	3.80	3.71	3.59	3.51	3.36	3.20	3.17	3.26	3.31
Girls	3.90	3.80	3.65	3.53	3.38	3.13	3.06	3.19	3.29
2021									
Boys	3.80	3.68	3.55	3.45	3.33	3.13	3.13	3.22	3.41
Girls	3.93	3.75	3.63	3.46	3.29	3.00	2.98	3.14	3.32

Table A6. Average attendance and engagement by student SEIFA and gender (2019 and 2021)

Primary school (grades 4-6)						High school (grades 8-10)					
Attendance rate						Attendance rate					
SEIFA quintile	1	2	3	4	5	SEIFA quintile	1	2	3	4	5
2019						2019					
Boys	89.74	91.12	91.99	92.80	93.62	Boys	88.25	89.71	90.98	91.40	93.29
Girls	90.90	91.89	92.13	92.97	93.84	Girls	88.40	89.86	90.33	90.98	92.90
2021						2021					
Boys	89.75	91.24	92.08	92.94	94.19	Boys	86.39	88.52	89.96	90.79	92.61
Girls	90.29	91.78	92.27	93.27	94.36	Girls	86.46	87.99	89.25	90.45	92.21
Cognitive engagement						Cognitive engagement					
SEIFA quintile	1	2	3	4	5	SEIFA quintile	1	2	3	4	5
2019						2019					
Boys	3.78	3.86	3.83	3.94	4.00	Boys	3.49	3.49	3.54	3.58	3.66
Girls	3.99	4.04	4.04	4.10	4.14	Girls	3.54	3.56	3.57	3.65	3.72
2021						2021					
Boys	3.81	3.81	3.87	3.89	3.96	Boys	3.44	3.52	3.53	3.61	3.70
Girls	3.94	4.00	4.01	4.07	4.09	Girls	3.44	3.52	3.52	3.59	3.65
Emotional engagement with teachers						Emotional engagement with teachers					
SEIFA quintile	1	2	3	4	5	SEIFA quintile	1	2	3	4	5
2019						2019					
Boys	3.14	3.15	3.15	3.20	3.21	Boys	2.92	2.89	2.91	2.93	2.97
Girls	3.26	3.27	3.30	3.31	3.32	Girls	2.91	2.92	2.92	2.95	2.98
2021						2021					
Boys	3.15	3.12	3.15	3.19	3.20	Boys	2.89	2.93	2.90	2.96	2.98
Girls	3.26	3.27	3.28	3.31	3.33	Girls	2.86	2.91	2.90	2.91	2.94
Connectedness to adults at school						Connectedness to adults at school					
SEIFA quintile	1	2	3	4	5	SEIFA quintile	1	2	3	4	5
2019						2019					
Boys	3.02	3.06	3.04	3.07	3.10	Boys	2.74	2.73	2.72	2.73	2.74
Girls	3.17	3.18	3.20	3.22	3.23	Girls	2.68	2.76	2.71	2.73	2.69
2021						2021					
Boys	3.05	3.06	3.09	3.12	3.13	Boys	2.77	2.82	2.76	2.84	2.87
Girls	3.19	3.22	3.21	3.25	3.28	Girls	2.74	2.79	2.77	2.73	2.79
School belonging						School belonging					
SEIFA quintile	1	2	3	4	5	SEIFA quintile	1	2	3	4	5
2019						2019					
Boys	3.65	3.70	3.70	3.78	3.84	Boys	3.27	3.29	3.29	3.34	3.43
Girls	3.72	3.77	3.78	3.85	3.90	Girls	3.04	3.10	3.10	3.19	3.27
2021						2021					
Boys	3.60	3.63	3.63	3.67	3.71	Boys	3.16	3.26	3.22	3.33	3.38
Girls	3.66	3.72	3.72	3.78	3.79	Girls	2.93	3.03	3.03	3.06	3.15
Peer belonging						Peer belonging					
SEIFA quintile	1	2	3	4	5	SEIFA quintile	1	2	3	4	5
2019						2019					
Boys	3.81	3.87	3.88	3.95	4.00	Boys	3.66	3.72	3.74	3.77	3.81
Girls	3.78	3.80	3.80	3.86	3.90	Girls	3.45	3.54	3.56	3.62	3.68
2021						2021					
Boys	3.76	3.81	3.84	3.88	3.92	Boys	3.61	3.69	3.67	3.73	3.80
Girls	3.67	3.73	3.71	3.78	3.80	Girls	3.36	3.47	3.51	3.51	3.61
School climate						School climate					
SEIFA quintile	1	2	3	4	5	SEIFA quintile	1	2	3	4	5
2019						2019					
Boys	3.61	3.67	3.70	3.75	3.81	Boys	3.17	3.16	3.22	3.25	3.42
Girls	3.69	3.76	3.78	3.82	3.91	Girls	3.07	3.14	3.18	3.24	3.37
2021						2021					
Boys	3.63	3.65	3.65	3.71	3.73	Boys	3.06	3.16	3.21	3.25	3.36
Girls	3.71	3.75	3.77	3.81	3.82	Girls	2.94	3.06	3.12	3.13	3.27

Table A7. Average attendance and engagement by student ARIA and gender (2019 and 2021)

Primary school (grades 4-6)						High school (grades 8-10)					
Attendance rate						Attendance rate					
ARIA	1	2	3	4	5	ARIA	1	2	3	4	5
2019						2019					
Boys	92.04	91.83	90.55	90.72	84.74	Boys	90.97	90.76	89.68	88.92	83.46
Girls	92.55	92.33	91.33	90.83	88.84	Girls	90.60	90.96	89.65	88.37	85.36
2021						2021					
Boys	92.42	91.55	90.08	90.51	88.34	Boys	90.09	89.43	87.48	87.07	85.77
Girls	92.67	91.86	90.98	91.70	89.10	Girls	89.52	89.34	87.84	86.99	82.65
Cognitive engagement						Cognitive engagement					
ARIA	1	2	3	4	5	ARIA	1	2	3	4	5
2019						2019					
Boys	3.92	3.80	3.79	3.84	3.67	Boys	3.59	3.49	3.45	3.43	3.53
Girls	4.07	4.02	4.06	3.98	4.05	Girls	3.64	3.54	3.57	3.58	3.25
2021						2021					
Boys	3.90	3.82	3.78	3.76	3.84	Boys	3.60	3.47	3.47	3.54	3.35
Girls	4.03	3.98	4.02	3.99	4.12	Girls	3.56	3.47	3.56	3.53	3.46
Emotional engagement with teachers						Emotional engagement with teachers					
ARIA	1	2	3	4	5	ARIA	1	2	3	4	5
2019						2019					
Boys	3.19	3.14	3.13	3.11	2.89	Boys	2.94	2.90	2.86	2.87	3.14
Girls	3.30	3.28	3.28	3.21	3.21	Girls	2.95	2.91	2.92	2.91	2.84
2021						2021					
Boys	3.18	3.13	3.11	3.08	3.08	Boys	2.94	2.90	2.89	2.92	2.76
Girls	3.30	3.25	3.29	3.24	3.23	Girls	2.90	2.89	2.93	2.90	2.92
Connectedness to adults at school						Connectedness to adults at school					
ARIA	1	2	3	4	5	ARIA	1	2	3	4	5
2019						2019					
Boys	3.07	3.00	3.04	3.04	2.90	Boys	2.73	2.73	2.73	2.76	3.13
Girls	3.21	3.18	3.22	3.14	3.21	Girls	2.70	2.70	2.76	2.77	2.99
2021						2021					
Boys	3.10	3.04	3.06	3.06	2.99	Boys	2.81	2.78	2.82	2.87	2.69
Girls	3.24	3.21	3.21	3.17	3.23	Girls	2.74	2.77	2.87	2.81	2.85
School belonging						School belonging					
ARIA	1	2	3	4	5	ARIA	1	2	3	4	5
2019						2019					
Boys	3.75	3.69	3.72	3.68	3.29	Boys	3.34	3.29	3.29	3.32	3.67
Girls	3.81	3.78	3.81	3.76	3.48	Girls	3.16	3.10	3.12	3.10	3.02
2021						2021					
Boys	3.66	3.61	3.63	3.65	3.75	Boys	3.28	3.20	3.25	3.33	3.15
Girls	3.73	3.69	3.81	3.71	3.81	Girls	3.03	3.02	3.08	3.06	3.23
Peer belonging						Peer belonging					
ARIA	1	2	3	4	5	ARIA	1	2	3	4	5
2019						2019					
Boys	3.92	3.85	3.88	3.88	3.80	Boys	3.75	3.74	3.68	3.76	3.95
Girls	3.84	3.78	3.84	3.82	3.70	Girls	3.57	3.54	3.58	3.58	3.32
2021						2021					
Boys	3.86	3.78	3.81	3.84	3.87	Boys	3.71	3.63	3.68	3.69	3.65
Girls	3.74	3.70	3.81	3.70	3.92	Girls	3.49	3.47	3.51	3.42	3.63
School climate						School climate					
ARIA	1	2	3	4	5	ARIA	1	2	3	4	5
2019						2019					
Boys	3.73	3.66	3.66	3.67	3.47	Boys	3.27	3.21	3.18	3.22	3.71
Girls	3.80	3.80	3.74	3.80	3.45	Girls	3.23	3.15	3.10	3.07	2.91
2021						2021					
Boys	3.69	3.61	3.63	3.73	3.76	Boys	3.22	3.14	3.18	3.23	3.19
Girls	3.78	3.74	3.78	3.71	3.90	Girls	3.10	3.10	3.09	3.10	3.22

1: Major Cities; 2: Inner Regional; 3: Outer Regional; 4: Remote; 5: Very Remote

Table A8. Average attendance and engagement by parent/guardian education and gender (2019 and 2021)

Primary school (grades 4-6)			High school (grades 8-10)		
Attendance rate			Attendance rate		
	Other	Bachelor		Other	Bachelor
2019			2019		
Boys	90.71	93.87	Boys	89.47	93.18
Girls	91.43	94.02	Girls	89.34	92.87
2021			2021		
Boys	90.57	94.35	Boys	87.91	92.78
Girls	91.02	94.55	Girls	87.68	92.26
Cognitive engagement			Cognitive engagement		
	Other	Bachelor		Other	Bachelor
2019			2019		
Boys	3.82	4.00	Boys	3.48	3.71
Girls	4.01	4.15	Girls	3.53	3.78
2021			2021		
Boys	3.80	3.99	Boys	3.48	3.71
Girls	3.95	4.14	Girls	3.44	3.74
Emotional engagement with teachers			Emotional engagement with teachers		
	Other	Bachelor		Other	Bachelor
2019			2019		
Boys	3.15	3.21	Boys	2.89	3.01
Girls	3.28	3.32	Girls	2.91	2.99
2021			2021		
Boys	3.15	3.19	Boys	2.90	3.00
Girls	3.26	3.33	Girls	2.87	2.97
Connectedness to adults at school			Connectedness to adults at school		
	Other	Bachelor		Other	Bachelor
2019			2019		
Boys	3.03	3.11	Boys	2.72	2.76
Girls	3.17	3.26	Girls	2.70	2.74
2021			2021		
Boys	3.06	3.13	Boys	2.78	2.88
Girls	3.20	3.29	Girls	2.72	2.84
School belonging			School belonging		
	Other	Bachelor		Other	Bachelor
2019			2019		
Boys	3.69	3.81	Boys	3.26	3.46
Girls	3.76	3.90	Girls	3.08	3.28
2021			2021		
Boys	3.60	3.73	Boys	3.22	3.37
Girls	3.67	3.84	Girls	2.96	3.19
Peer belonging			Peer belonging		
	Other	Bachelor		Other	Bachelor
2019			2019		
Boys	3.86	3.97	Boys	3.71	3.81
Girls	3.80	3.89	Girls	3.52	3.68
2021			2021		
Boys	3.79	3.92	Boys	3.66	3.76
Girls	3.69	3.82	Girls	3.43	3.60
School climate			School climate		
	Other	Bachelor		Other	Bachelor
2019			2019		
Boys	3.68	3.76	Boys	3.19	3.36
Girls	3.76	3.85	Girls	3.12	3.35
2021			2021		
Boys	3.65	3.71	Boys	3.15	3.31
Girls	3.73	3.83	Girls	3.03	3.24

Table A9. Average attendance and engagement by family language background and gender (2019 and 2021)

Primary school (grades 4-6)			High school (grades 8-10)		
Attendance rate			Attendance rate		
	English	Non-English		English	Non-English
2019			2019		
Boys	91.57	92.49	Boys	90.14	92.46
Girls	92.19	92.75	Girls	90.10	91.60
2021			2021		
Boys	91.48	93.45	Boys	88.74	92.11
Girls	91.93	93.52	Girls	88.38	91.73
Cognitive engagement			Cognitive engagement		
	English	Non-English		English	Non-English
2019			2019		
Boys	3.85	3.99	Boys	3.49	3.75
Girls	4.05	4.09	Girls	3.56	3.80
2021			2021		
Boys	3.83	3.99	Boys	3.50	3.75
Girls	4.00	4.09	Girls	3.48	3.74
Emotional engagement with teachers			Emotional engagement with teachers		
	English	Non-English		English	Non-English
2019			2019		
Boys	3.15	3.22	Boys	2.90	3.02
Girls	3.29	3.31	Girls	2.91	3.02
2021			2021		
Boys	3.15	3.20	Boys	2.91	3.00
Girls	3.28	3.32	Girls	2.88	2.98
Connectedness to adults at school			Connectedness to adults at school		
	English	Non-English		English	Non-English
2019			2019		
Boys	3.04	3.10	Boys	2.72	2.78
Girls	3.20	3.21	Girls	2.70	2.74
2021			2021		
Boys	3.09	3.09	Boys	2.80	2.84
Girls	3.23	3.25	Girls	2.77	2.75
School belonging			School belonging		
	English	Non-English		English	Non-English
2019			2019		
Boys	3.71	3.82	Boys	3.29	3.46
Girls	3.79	3.86	Girls	3.10	3.29
2021			2021		
Boys	3.62	3.73	Boys	3.23	3.39
Girls	3.71	3.80	Girls	3.00	3.16
Peer belonging			Peer belonging		
	English	Non-English		English	Non-English
2019			2019		
Boys	3.88	3.97	Boys	3.71	3.84
Girls	3.82	3.87	Girls	3.54	3.68
2021			2021		
Boys	3.82	3.90	Boys	3.67	3.78
Girls	3.72	3.81	Girls	3.46	3.57
School climate			School climate		
	English	Non-English		English	Non-English
2019			2019		
Boys	3.68	3.80	Boys	3.19	3.42
Girls	3.78	3.84	Girls	3.14	3.40
2021			2021		
Boys	3.65	3.75	Boys	3.15	3.37
Girls	3.75	3.83	Girls	3.05	3.25

Table A10. Prevalence of 'low' levels of engagement on 0-6 engagement factors

	2019	2021
N	68,621 (100%)	76,655 (100%)
Number of engagement factors "low"		
0	40,783 (61.2%)	43,729 (58.7%)
1	12,323 (18.5%)	13,696 (18.4%)
2	6,354 (9.5%)	7,858 (10.5%)
3	3,923 (5.9%)	5,065 (6.8%)
4	2,025 (3.0%)	2,692 (3.6%)
5	858 (1.3%)	1,040 (1.4%)
6	402 (0.6%)	467 (0.6%)

Table A11. Mean engagement for students by level of attendance (2019 and 2021)

2019	At least 90%	80-90%	Less than 80%	Total
N	48,265 (70.3%)	13,957 (20.3%)	6,399 (9.3%)	68,621 (100.0%)
Cognitive engagement	3.836 (0.788)	3.648 (0.856)	3.434 (0.926)	3.762 (0.825)
Emotional engagement with teachers	3.127 (0.551)	3.017 (0.594)	2.926 (0.619)	3.087 (0.570)
Connectedness with adults at school	2.976 (0.817)	2.855 (0.855)	2.752 (0.868)	2.931 (0.832)
School belonging	3.577 (1.019)	3.353 (1.083)	3.121 (1.126)	3.491 (1.053)
Peer belonging	3.805 (0.906)	3.657 (0.959)	3.483 (1.013)	3.746 (0.933)
School climate	3.538 (0.860)	3.363 (0.919)	3.231 (0.960)	3.475 (0.888)
Attendance rate	95.566 (2.777)	86.098 (2.725)	68.073 (12.685)	91.076 (9.513)

2021	At least 90%	80-90%	Less than 80%	Total
N	52,118 (68.0%)	15,952 (20.8%)	8,585 (11.2%)	76,655 (100.0%)
Cognitive engagement	3.832 (0.777)	3.599 (0.849)	3.337 (0.915)	3.731 (0.825)
Emotional engagement with teachers	3.126 (0.551)	3.003 (0.583)	2.905 (0.614)	3.076 (0.570)
Connectedness with adults at school	3.033 (0.801)	2.908 (0.841)	2.767 (0.874)	2.978 (0.822)
School belonging	3.517 (1.022)	3.256 (1.068)	3.012 (1.097)	3.408 (1.054)
Peer belonging	3.753 (0.907)	3.574 (0.955)	3.378 (1.007)	3.675 (0.937)
School climate	3.512 (0.860)	3.313 (0.908)	3.147 (0.944)	3.431 (0.889)
Attendance rate	95.612 (2.728)	86.150 (2.792)	67.463 (12.617)	90.490 (10.279)

Table A12. Preliminary OLS regressions: estimated coefficients for equation (1) models predicting boys' attendance

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	
Cognitive Engagement	1.269*** (0.0301)						
Emotional Engagement with Teachers		1.143*** (0.0390)					
Peer Belonging			0.710*** (0.0252)				
School Belonging				0.749*** (0.0215)			
Connectedness to Adults at School					0.658*** (0.0267)		
School Climate						0.534*** (0.0260)	
School Grade	Grade 4	ref	ref	ref	ref	ref	
	Grade 5	-0.275*** (0.0717)	-0.300*** (0.0717)	-0.316*** (0.0714)	-0.257*** (0.0716)	-0.313*** (0.0717)	-0.272*** (0.0716)
	Grade 6	-0.561*** (0.0703)	-0.608*** (0.0703)	-0.679*** (0.0702)	-0.578*** (0.0705)	-0.669*** (0.0705)	-0.577*** (0.0704)
	Grade 7	-0.976*** (0.0747)	-1.062*** (0.0750)	-1.176*** (0.0748)	-1.037*** (0.0749)	-1.129*** (0.0750)	-1.029*** (0.0751)
	Grade 8	-0.835*** (0.137)	-0.987*** (0.137)	-1.097*** (0.137)	-0.947*** (0.137)	-1.085*** (0.137)	-0.995*** (0.137)
	Grade 9	-1.634*** (0.143)	-1.822*** (0.143)	-1.999*** (0.143)	-1.807*** (0.142)	-1.982*** (0.143)	-1.846*** (0.143)
	Grade 10	-1.442*** (0.164)	-1.734*** (0.164)	-1.839*** (0.164)	-1.694*** (0.164)	-1.786*** (0.164)	-1.738*** (0.165)
	Grade 11	-1.518*** (0.179)	-1.799*** (0.177)	-1.881*** (0.179)	-1.718*** (0.177)	-1.860*** (0.178)	-1.800*** (0.177)
	Grade 12	-1.569*** (0.198)	-2.000*** (0.197)	-1.928*** (0.198)	-1.812*** (0.197)	-1.950*** (0.197)	-1.913*** (0.197)
Family Language Background	English	ref	ref	ref	ref	ref	
	Non-English	1.025*** (0.0585)	1.164*** (0.0583)	1.192*** (0.0585)	1.167*** (0.0584)	1.221*** (0.0586)	1.174*** (0.0585)
SEIFA	1st Quintile	ref	ref	ref	ref	ref	
	2nd Quintile	0.528*** (0.125)	0.547*** (0.125)	0.582*** (0.125)	0.529*** (0.125)	0.579*** (0.125)	0.557*** (0.125)
	3rd Quintile	0.760*** (0.117)	0.762*** (0.118)	0.793*** (0.118)	0.755*** (0.118)	0.790*** (0.118)	0.769*** (0.118)
	4th Quintile	0.889*** (0.113)	0.938*** (0.113)	0.977*** (0.113)	0.934*** (0.113)	0.956*** (0.113)	0.969*** (0.114)
	5th Quintile	1.095*** (0.122)	1.149*** (0.122)	1.156*** (0.122)	1.130*** (0.122)	1.170*** (0.122)	1.161*** (0.122)
Parent/Guardian Education	Other	ref	ref	ref	ref	ref	
	Bachelor Degree	1.619*** (0.0452)	1.736*** (0.0452)	1.763*** (0.0452)	1.731*** (0.0452)	1.759*** (0.0452)	1.788*** (0.0453)
Constant		90.38*** (0.680)	91.39*** (0.933)	91.73*** (0.758)	92.06*** (0.890)	93.01*** (0.855)	92.83*** (0.775)
<i>N</i>		157188	158211	158144	157199	158752	157923
<i>R</i> ²		0.110	0.104	0.103	0.105	0.102	0.101

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A13. Preliminary OLS regressions: estimated coefficients for equation (1) models predicting girls' attendance

		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Cognitive Engagement		1.390*** (0.0316)					
Emotional Engagement with Teachers			1.367*** (0.0425)				
Peer Belonging				0.883*** (0.0245)			
School Belonging					0.854*** (0.0220)		
Connectedness to Adults at School						0.787*** (0.0285)	
School Climate							0.608*** (0.0274)
School Grade	Grade 4	ref	ref	ref	ref	ref	ref
	Grade 5	-0.0301 (0.0707)	-0.0542 (0.0707)	-0.0738 (0.0704)	0.00193 (0.0710)	-0.0866 (0.0708)	-0.0346 (0.0708)
	Grade 6	-0.189*** (0.0701)	-0.227*** (0.0702)	-0.312*** (0.0696)	-0.149** (0.0703)	-0.318*** (0.0702)	-0.213*** (0.0703)
	Grade 7	-0.548*** (0.0741)	-0.605*** (0.0745)	-0.766*** (0.0738)	-0.524*** (0.0744)	-0.720*** (0.0744)	-0.619*** (0.0748)
	Grade 8	-0.586*** (0.139)	-0.740*** (0.140)	-0.951*** (0.138)	-0.606*** (0.140)	-0.931*** (0.139)	-0.803*** (0.141)
	Grade 9	-1.925*** (0.144)	-2.100*** (0.145)	-2.354*** (0.144)	-1.945*** (0.146)	-2.368*** (0.145)	-2.158*** (0.147)
	Grade 10	-2.602*** (0.174)	-2.835*** (0.174)	-3.068*** (0.173)	-2.694*** (0.174)	-3.059*** (0.174)	-2.875*** (0.175)
	Grade 11	-3.113*** (0.189)	-3.493*** (0.189)	-3.637*** (0.188)	-3.336*** (0.189)	-3.644*** (0.189)	-3.510*** (0.191)
	Grade 12	-3.066*** (0.197)	-3.468*** (0.197)	-3.448*** (0.196)	-3.214*** (0.197)	-3.560*** (0.196)	-3.383*** (0.198)
Family Language Background	English	ref	ref	ref	ref	ref	ref
	Non-English	0.871*** (0.0599)	1.000*** (0.0603)	0.993*** (0.0601)	0.987*** (0.0602)	1.082*** (0.0604)	1.003*** (0.0604)
SEIFA	1st Quintile	ref	ref	ref	ref	ref	ref
	2nd Quintile	0.557*** (0.123)	0.546*** (0.124)	0.543*** (0.124)	0.538*** (0.124)	0.551*** (0.124)	0.557*** (0.124)
	3rd Quintile	0.506*** (0.117)	0.485*** (0.118)	0.455*** (0.117)	0.472*** (0.118)	0.483*** (0.118)	0.490*** (0.118)
	4th Quintile	0.786*** (0.114)	0.808*** (0.115)	0.766*** (0.114)	0.788*** (0.115)	0.809*** (0.115)	0.818*** (0.115)
	5th Quintile	0.936*** (0.123)	0.937*** (0.123)	0.908*** (0.123)	0.932*** (0.123)	0.945*** (0.123)	0.965*** (0.123)
Parent/Guardian Education	Other	ref	ref	ref	ref	ref	ref
	Bachelor Degree	1.449*** (0.0463)	1.594*** (0.0463)	1.607*** (0.0462)	1.574*** (0.0463)	1.588*** (0.0465)	1.644*** (0.0465)
Constant		87.45*** (2.582)	88.33*** (2.740)	88.94*** (2.790)	89.36*** (2.475)	90.42*** (2.698)	90.20*** (2.631)
<i>N</i>		150611	151169	151334	150536	151489	150986
<i>R</i> ²		0.117	0.110	0.112	0.113	0.107	0.106

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A14. First stage of 2SLS regressions: estimated coefficients for equation (2) models predicting boys' engagement

		Cognitive Engagement	Emotional Engagement with Teachers	Peer Belonging	School Belonging	Connectedness to Adults at School	School Climate
Engagement (flow)		0.447*** (0.00198)	0.251*** (0.00156)	0.375*** (0.00247)	0.460*** (0.00263)	0.271*** (0.00212)	0.346*** (0.00230)
School Grade	Grade 4	ref	ref	ref	ref	ref	ref
	Grade 5	-0.0404*** (0.00639)	-0.0242*** (0.00480)	-0.0138* (0.00779)	-0.115*** (0.00914)	-0.00825 (0.00700)	-0.134*** (0.00741)
	Grade 6	-0.0670*** (0.00613)	-0.0535*** (0.00466)	0.000331 (0.00757)	-0.160*** (0.00881)	-0.0238*** (0.00679)	-0.229*** (0.00722)
	Grade 7	-0.0881*** (0.00629)	-0.0781*** (0.00482)	0.0304*** (0.00778)	-0.168*** (0.00899)	-0.0353*** (0.00703)	-0.278*** (0.00738)
	Grade 8	-0.154*** (0.0105)	-0.133*** (0.00813)	-0.00213 (0.0130)	-0.284*** (0.0147)	-0.115*** (0.0118)	-0.364*** (0.0124)
	Grade 9	-0.245*** (0.0107)	-0.202*** (0.00829)	-0.0365*** (0.0132)	-0.368*** (0.0148)	-0.178*** (0.0121)	-0.501*** (0.0126)
	Grade 10	-0.306*** (0.0118)	-0.207*** (0.00926)	-0.0961*** (0.0147)	-0.403*** (0.0163)	-0.229*** (0.0137)	-0.527*** (0.0140)
	Grade 11	-0.334*** (0.0123)	-0.161*** (0.00972)	-0.155*** (0.0155)	-0.417*** (0.0170)	-0.221*** (0.0144)	-0.458*** (0.0147)
	Grade 12	-0.316*** (0.0132)	-0.0487*** (0.0104)	-0.129*** (0.0168)	-0.367*** (0.0184)	-0.104*** (0.0155)	-0.364*** (0.0157)
Family language background							
	English	ref	ref	ref	ref	ref	ref
	Non-English	0.0877*** (0.00433)	0.0197*** (0.00344)	0.0296*** (0.00549)	0.0391*** (0.00619)	-0.0287*** (0.00513)	0.0806*** (0.00534)
SEIFA	1st Quintile	ref	ref	ref	ref	ref	ref
	2nd Quintile	0.0173** (0.00820)	0.0219*** (0.00640)	0.0408*** (0.0102)	0.0467*** (0.0114)	0.0304*** (0.00937)	0.0202** (0.00968)
	3rd Quintile	0.0218*** (0.00798)	0.0158** (0.00618)	0.0320*** (0.00986)	0.0354*** (0.0109)	0.0276*** (0.00911)	0.0173* (0.00935)
	4th Quintile	0.0442*** (0.00798)	0.0326*** (0.00623)	0.0339*** (0.00998)	0.0352*** (0.0111)	0.0337*** (0.00927)	0.00899 (0.00939)
	5th Quintile	0.0442*** (0.00882)	0.0285*** (0.00696)	0.0515*** (0.0112)	0.0514*** (0.0124)	0.0384*** (0.0104)	0.0299*** (0.0105)
Parent/Guardian Education							
	Other	ref	ref	ref	ref	ref	ref
	Bachelor Degree	0.127*** (0.00379)	0.0451*** (0.00303)	0.0390*** (0.00492)	0.0585*** (0.00544)	0.0565*** (0.00457)	-0.0107** (0.00464)
Constant		1.725*** (0.269)	1.941*** (0.439)	2.698*** (0.485)	1.792*** (0.668)	1.514*** (0.480)	2.181*** (0.642)
<i>N</i>		175536	173869	174980	173191	173627	173921
<i>R</i> ²		0.337	0.218	0.177	0.227	0.136	0.242

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A15. First stage of 2SLS regressions: estimated coefficients for equation (2) models predicting girls' engagement

		Cognitive Engagement	Emotional Engagement with Teachers	Peer Belonging	School Belonging	Connectedness to Adults at School	School Climate
Engagement (flow)		0.461*** (0.00194)	0.249*** (0.00147)	0.391*** (0.00258)	0.476*** (0.00272)	0.291*** (0.00211)	0.330*** (0.00228)
School Grade	Grade 4	ref	ref	ref	ref	ref	ref
	Grade 5	-0.0674*** (0.00606)	-0.0462*** (0.00450)	-0.0422*** (0.00809)	-0.153*** (0.00909)	-0.0178*** (0.00684)	-0.157*** (0.00718)
	Grade 6	-0.124*** (0.00582)	-0.0968*** (0.00436)	-0.0710*** (0.00792)	-0.256*** (0.00876)	-0.0578*** (0.00662)	-0.261*** (0.00696)
	Grade 7	-0.158*** (0.00601)	-0.143*** (0.00453)	-0.0534*** (0.00812)	-0.325*** (0.00900)	-0.107*** (0.00683)	-0.348*** (0.00719)
	Grade 8	-0.260*** (0.0102)	-0.229*** (0.00766)	-0.113*** (0.0137)	-0.513*** (0.0148)	-0.243*** (0.0116)	-0.516*** (0.0122)
	Grade 9	-0.338*** (0.0104)	-0.305*** (0.00783)	-0.182*** (0.0139)	-0.649*** (0.0151)	-0.288*** (0.0118)	-0.704*** (0.0125)
	Grade 10	-0.384*** (0.0117)	-0.310*** (0.00881)	-0.208*** (0.0155)	-0.657*** (0.0165)	-0.303*** (0.0136)	-0.738*** (0.0139)
	Grade 11	-0.393*** (0.0122)	-0.244*** (0.00914)	-0.208*** (0.0164)	-0.584*** (0.0172)	-0.259*** (0.0142)	-0.643*** (0.0145)
	Grade 12	-0.351*** (0.0127)	-0.128*** (0.00959)	-0.232*** (0.0172)	-0.513*** (0.0179)	-0.135*** (0.0149)	-0.530*** (0.0149)
Family language background	English	ref	ref	ref	ref	ref	ref
	Non-English	0.0612*** (0.00432)	0.0161*** (0.00328)	0.0284*** (0.00585)	0.0309*** (0.00631)	-0.0412*** (0.00506)	0.0620*** (0.00524)
SEIFA	1st Quintile	ref	ref	ref	ref	ref	ref
	2nd Quintile	0.00683 (0.00802)	0.00782 (0.00600)	0.0256** (0.0109)	0.00381 (0.0115)	0.0362*** (0.00919)	-0.00962 (0.00958)
	3rd Quintile	0.0122 (0.00770)	0.00861 (0.00580)	0.0441*** (0.0106)	0.0220** (0.0111)	0.0408*** (0.00887)	-0.00361 (0.00928)
	4th Quintile	0.0285*** (0.00766)	0.0146** (0.00581)	0.0550*** (0.0106)	0.0322*** (0.0112)	0.0385*** (0.00899)	-0.00303 (0.00927)
	5th Quintile	0.0347*** (0.00857)	0.0184*** (0.00651)	0.0753*** (0.0119)	0.0404*** (0.0125)	0.0434*** (0.0101)	0.000990 (0.0103)
Parent/Guardian Education	Other	ref	ref	ref	ref	ref	ref
	Bachelor Degree	0.123*** (0.00373)	0.0360*** (0.00288)	0.0338*** (0.00524)	0.0683*** (0.00556)	0.0637*** (0.00447)	0.00386 (0.00454)
Constant		2.425*** (0.284)	2.596*** (0.117)	3.402*** (0.236)	2.701*** (0.303)	2.069*** (0.111)	3.437*** (0.314)
<i>N</i>		168897	167334	168277	166974	167010	167431
<i>R</i> ²		0.377	0.268	0.187	0.275	0.183	0.286

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A16. WEC engagement constructs⁴

<p>Connectedness to adults at school</p> <p>At my school, there is a teacher or another adult who really cares about me.</p> <p>At my school, there is a teacher or another adult who believes that I will be a success.</p> <p>At my school, there is a teacher or another adult who listens to me when I have something to say.</p>	<p>(4-pt Likert)</p> <p>1 = Not at all true</p> <p>2 = A little true</p> <p>3 = Pretty much true</p> <p>4 = Very much true</p>
<p>Emotional engagement with teachers</p> <p>I get along well with most of my teachers.</p> <p>Most of my teachers are interested in my well-being.</p> <p>Most of my teachers really listen to what I have to say.</p> <p>If I need extra help, I will receive it from my teachers.</p> <p>Most of my teachers treat me fairly.</p>	<p>(4-pt Likert)</p> <p>1 = Strongly disagree</p> <p>2 = Disagree</p> <p>3 = Agree</p> <p>4 = Strongly agree</p>
<p>School climate</p> <p>Teachers and students treat each other with respect in this school.</p> <p>People care about each other in this school.</p> <p>Students in this school help each other, even if they are not friends.</p>	<p>(5-pt Likert)</p> <p>1 = Strongly disagree</p> <p>2 = Disagree</p> <p>3 = Don't agree or disagree</p> <p>4 = Agree</p> <p>5 = Strongly agree</p>
<p>Cognitive engagement</p> <p>I work hard on learning.</p> <p>When I found something hard I tried another way.</p> <p>I take a lot of care with what I do.</p> <p>No matter who you are, you can change your intelligence.</p> <p>I am excited to come up with new things.</p>	<p>(5-pt Likert)</p> <p>1 = None of the time</p> <p>2 = A little of the time</p> <p>3 = Some of the time</p> <p>4 = Most of the time</p> <p>5 = All of the time</p>
<p>Peer belonging</p> <p>I feel part of a group of friends that do things together.</p> <p>I feel that I usually fit in with other kids around me.</p> <p>When I am with other kids my age, I feel I belong.</p>	<p>(5-pt Likert)</p> <p>1 = Strongly disagree</p> <p>2 = Disagree</p> <p>3 = Don't agree or disagree</p> <p>4 = Agree</p> <p>5 = Strongly agree</p>
<p>School belonging</p> <p>I feel like I belong in this school.</p> <p>I feel like I am important to this school.</p>	<p>(5-pt Likert)</p> <p>1 = Strongly disagree</p> <p>2 = Disagree</p> <p>3 = Don't agree or disagree</p> <p>4 = Agree</p> <p>5 = Strongly agree</p>
<p>Engagement (flow)</p> <p>When I do an activity, I enjoy it so much that I lose track of time.</p> <p>I get completely absorbed in what I am doing.</p> <p>I get so involved in activities that I forget about everything else.</p>	<p>(5-pt Likert)</p> <p>1 = None of the time</p> <p>2 = A little of the time</p> <p>3 = Some of the time</p> <p>4 = Most of the time</p> <p>5 = All of the time</p>

⁴ Note that the response wording for some of the scales was slightly different prior to revision in 2019; see Gregory, T., & Brinkman, S. (2020). *History of the WEC in the South Australian school system and psychometric properties of the WEC survey instrument*. Fraser Mustard Centre.