Making a difference to student wellbeing—a data exploration

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NZCER
Rangahau Mātauranga o Aotearoa

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Contents

1. Summary

1.1 Introduction

This report describes a study that analysed Wellbeing@School student and teacher survey data from 400 New Zealand schools. The study explored the following questions:

1. Are there school practices associated with higher levels of student wellbeing or lower levels of student aggressive behaviours?
2. Are some school or student characteristics more likely to be associated with high or low wellbeing or student aggressive behaviours than others?

The study examined the relationships between four measures created from Wellbeing@School data: a *student wellbeing* measure; a *student aggressive behaviours* measure; a teacher measure of *school-wide actions*; and a teacher measure of *teaching for wellbeing*.

Some of the findings from this research have previously been summarised in the infographic report *Making a difference to student wellbeing* (Lawes & Boyd, 2017).[1] This current report provides the methodological details behind the infographic report and also extends the findings. However, this current report is self-contained and may be read independently.

1.2 Findings

1.2.1 Both *student wellbeing* and *student aggressive behaviours* varied substantially between and within schools

Student wellbeing varied substantially between schools. For example, at schools with the lowest levels of *student wellbeing* around 68% of students agreed with the statement 'I feel I belong at school.' In contrast, this figure was 97% at schools with the highest levels of *student wellbeing*.

Student aggressive behaviours also varied substantially between schools. For example, at primary schools with the lowest levels of *student aggressive behaviours* around 2% of students reported experiencing bullying at least weekly. In contrast, in primary schools with the highest levels of *student aggressive behaviours* 42% of students reported experiencing bullying at least weekly.

Despite the substantial between-school variation exhibited by both *student wellbeing* and *student aggressive behaviours*, between-school variation made up a smaller proportion of the total variation than

1 http://www.nzcer.org.nz/infographic-making-difference-student-wellbeing

within-school variation for both of these measures. That is, while average levels of *student wellbeing* and *student aggressive behaviours* differed between schools, these differences were small compared with the range of student wellbeing and *student aggressive behaviours* experienced by students in any given school.

1.2.2 School practices matter for supporting student wellbeing

(a) School practices matter for *student wellbeing*

The *teaching for wellbeing* and the *school-wide* actions measures both predicted *student wellbeing*. This relationship was strongest for the *teaching for wellbeing* measure. On the whole, the practices that supported *student wellbeing* were similar across different groups of students – all students, Māori students, and Pasifika students.

After accounting for student and school characteristics:

- On average, students at schools where teachers actively taught for wellbeing had higher wellbeing levels than students at other schools.
- On average, students at schools with a broad range of school-wide policies and practices in place to promote wellbeing also had higher wellbeing levels than students at other schools.

While *teaching for wellbeing and the school-wide actions* measures both predicted student wellbeing, after accounting for student and school characteristics **student wellbeing was more strongly associated with *teaching for wellbeing* than *school-wide actions.***

(b) School practices matter for student aggressive behaviours

The *school-wide actions* measure was a predictor of student aggressive behaviour and the *teaching for wellbeing measure was not*. That is, after accounting for student and school characteristics:

- Students at schools with a broad range of school-wide policies and practices in place to promote wellbeing were less likely to report experiencing aggressive behaviours than students at other schools.
- Students at schools where teachers actively taught for wellbeing were no more or less likely to report experiencing aggressive behaviours than students at other schools.

1.2.3 School and student characteristics are associated with wellbeing

(a) School and student characteristics are associated with *student wellbeing*

After accounting for student or school characteristics:

- Boys' wellbeing was no different to girls' wellbeing.
- On average, older students had lower levels of wellbeing than younger students.
- On average, Pasifika students had higher wellbeing levels than NZ European, Asian, and Other students. On average, Māori students had the lowest levels of wellbeing.
- On average, the wellbeing levels of students at decile 4–7 schools were lower than the wellbeing levels of students at other schools.

(b) School and student characteristics are associated with *student aggressive behaviours*

After accounting for student or school characteristics:

- Boys were more likely to report experiencing aggressive behaviours than girls.
- Older students were less likely to report experiencing aggressive behaviours than younger students.
- Asian students were more likely to report experiencing aggressive behaviours than Pasifika, Māori, NZ European, and Other students who reported similar levels of aggressive behaviours.
- Students at decile 8–10 schools were less likely to report experiencing aggressive behaviours than students at other schools.

2.
Overview

2.1 The wellbeing of students

A sense of wellbeing is central to students' success at school and in life. The importance of wellbeing is stated in *The New Zealand Curriculum* which aims to develop young people who are "confident ... positive in their own identity ... resilient ... able to relate well to others ..." (Ministry of Education, 2007, p. 8).

New Zealand students face considerable challenges to their social and emotional wellbeing. New Zealand has high rates of school bullying compared with other countries (Ministry of Education, 2017). Bullying is usually defined as deliberately harmful, repeated behaviour, which involves a power imbalance. Bullying is a form of aggressive behaviour that is different from one-off acts of aggression or fighting. Involvement in bullying behaviour (as a perpetrator or a target) is associated with negative longer-term health and education outcomes for young people. Being a target of bullying contributes to suicide behaviours (Fortune et al., 2010), and New Zealand has one of the highest rates of youth suicide in OECD countries (Gluckman, 2017; OECD, 2009).

Bullying behaviour is often viewed as an individual action or interpersonal problem, however more recent explanations describe bullying as a group and systemic phenomenon (e.g., Espelage & Swearer, 2010) that is influenced by those who are being bullied as well as peers, adults, parents, and school, home, community, and societal environments.

As research indicates, bullying behaviour is an issue in New Zealand schools, and schools can influence this behaviour. This suggests we need more focus on fostering young people's wellbeing at school and on approaches that assist young people to develop the skills and competencies they need to manage their wellbeing.

Multifaceted Whole School Approaches are the most effective way for schools to promote a range of facets of health and wellbeing including addressing bullying behaviour (Langford et al., 2015; Ttofi & Farrington, 2011). One reason Whole School Approaches are effective is because they include multiple components that address different layers of the system that surrounds students. Less is known about the most effective components of a Whole School Approach (Bradshaw, 2015). We wanted to know what New Zealand data could tell us about these components.

2.2 Research questions

The Wellbeing@School toolkit[2] provides survey tools and processes that can be used by New Zealand schools to collect and review data. The surveys explore the extent to which students and teachers perceive that different aspects of school life create a safe and caring social climate that deters bullying. These aspects were developed from research findings about the common components of Whole School Approaches in initiatives that aimed to alter school climates. The Wellbeing@School toolkit and its associated data are described further in sections 3.1 and 3.2.

We were mainly interested in the components of a Whole School Approach that might make a difference to student wellbeing and students' experience of aggressive behaviours. Therefore, to further understand schools' approaches, policies, and actions, we needed to account for these contexts. We refined our interest in the effective components of a Whole School Approach to the following research questions:

1. Are there school practices associated with higher levels of student wellbeing or lower levels of student aggressive behaviours?
2. Are some school or student characteristics more likely to be associated with high or low wellbeing or student aggressive behaviours than others?

Each school has its own unique context, and this also influenced our methodological approach. We wanted to measure school approaches, policies, and actions while accounting for school context. However, we also wanted to understand how outcomes differed by school context. Given these goals and a large data set to work with, a statistical modelling approach was appropriate.

Because the Wellbeing@School data was not collected with the intent to answer our research questions, we used an exploratory data analysis approach. In particular, we did not solely rely on the measurement scales already created for the purpose of producing reports for schools. Instead we used student and teacher responses, and created revised measures if needed.

2.3 Method

The findings in this report were based on our analysis of data collected from 58,337 students and 3,416 teachers at 400 schools using the Wellbeing@School survey toolkit from 2013 to 2016. Following exploratory factor analysis, we used Rasch measurement techniques to construct four measures: a *student wellbeing* measure; a *student aggressive behaviours* measure; a teacher measure of *school-wide actions*; and a teacher measure of *teaching for wellbeing*. To address the research questions, we then applied a number of multilevel linear models to linked student and teacher data to understand how differences in *student wellbeing* and *student aggressive behaviours* are associated with differences in *school-wide actions*, *teaching for wellbeing*, and school and student characteristics.

2 http://www.wellbeingatschool.org.nz

3.
The Wellbeing@School survey tools and data

In this section we briefly describe the Wellbeing@School tools and the data that was gathered using these tools which we have used in our research.

3.1 The Wellbeing@School survey tools

While the research described in this report is exploratory, the Wellbeing@School tools we used were purposefully designed to capture student and teacher data. These Wellbeing@School tools are psychometrically robust survey instruments developed for use in New Zealand schools (Ferral, Darr, Shih, Boyd, & Fisher, 2012). The surveys, funded by the Ministry of Education, explore the extent to which students and teachers perceive that different aspects of school life create a safe and caring social climate that deters bullying. The surveys also include a scale that measures student and teacher experiences of the main forms of student aggressive behaviour that together constitute bullying.

There are two survey forms for students: a Primary Survey for students in Years 5–8; and an Intermediate/Secondary survey for students in Years 7–13. The two forms contain most of the same items with language appropriate to each age group. There is another form for teachers. Some of the items on the teacher form are closely linked to those on the student forms, but other items have no student counterparts.

All schools that use the Wellbeing@School tools receive confidential online summary reports of their data. Student reports provide summaries by characteristics such as gender, ethnicity, and year level. Schools are able to archive their reports on the Wellbeing@School website, and can access information resources and a helpdesk. The website is designed to provide support to schools as they make use of data within the framework of a suggested self-review cycle.

3.2 Wellbeing@School data

Three linked data sets were analysed to produce this report. They are summarised in Table 1.

The first data set consisted of all ***student data*** collected by the Wellbeing@School tools from 2013 to 2016. For any school that used the Wellbeing@School tools more than once during 2013 to 2016, only data from the latest (most recent) use was included. The first data set was used to generate the *student wellbeing* and *student aggressive behaviours* measures (see sections 4.1 and 4.2). Importantly, the first data set identified the school at which the Wellbeing@School data was captured.

The second data set consisted of ***teacher data*** collected by the Wellbeing@School tools from 2013 to 2016. Again, for any school that used the Wellbeing@School tools more than once during 2013 to 2016, only data from the latest (most recent) use was included. The second data set was used to generate the *teaching for wellbeing* and *school-wide actions measures* (see sections 4.3 and 4.4). The second data set also identified the school at which the Wellbeing@School data was captured.

The third data set consists of linked ***student and teacher data*** from the same schools. This data set consists of all student data, and a modified version of all teacher data, collected by the Wellbeing@School tools from 2013 to 2016 in schools where *both* student and teacher data was collected. The modification involved averaging the teacher data collected from different teachers within the same school, giving each school a unique value—the school's average—for every variable in the teacher data set. The merging was carried out using the school identifiers in the first and second data sets. The third data set therefore recorded, for each student, all of the student's own data together with an average of all of the data from the teachers at the same school.

This third data set allowed multilevel modelling of the *student wellbeing* and *student aggressive behaviours* measures using the *teaching for wellbeing* and *school-wide actions* measures as explanatory variables.

TABLE 1 **The data sets**

Factor		School data		Teacher data		Merged school and teacher data		
		Students	Schools	Teachers	Schools	Students	Teachers	Schools
Gender	Girls	31491				11439		
	Boys	26617				8827		
	Missing	229				94		
Ethnic group	NZ European or Other	36790				12915		
	Māori	12739				4177		
	Pasifika	7901				3023		
	Asian	8962				3128		
Decile	Low (1,2 or 3)	10327	99	667	49	3359	400	28
	Med (4,5, 6 or 7)	26400	173	1391	77	8563	850	53
	High (8,9 or 10)	21610	128	1326	67	8438	871	40
	Missing	0	0	32	3	0	0	0
Year level	5	7028				2608		
	6	7129				2572		
	7	8106				3223		
	8	7606				3291		
	9	9979				1999		
	10	10913				2047		
	11	3022				1789		
	12	2614				1607		
	13	1940				1224		
Total		**58337**	**400**	**3416**	**196**	**20360**	**2121**	**121**

Note: The NZ European and Other ethnic groups are merged here to enable comparison with Table 11 and Table 12 where there were no significant differences in model outcomes between these two ethnic groups.

4.
Measures

In this section we describe the construction of the four measures we used to quantify student wellbeing and aggressive behaviours as well as school policies and practices. As mentioned in section 3.2, the teacher data set was used to derive the measures of school policies and practices and the student data set was used to derive the measures of student wellbeing and aggressive behaviours.

The derivation of the measures of school policies and practices began with an exploratory factor analysis of the teacher data set. The exploratory factor analysis revealed three factors—what would become the *teaching for wellbeing* and *school-wide actions* measures together with a factor summarising teacher perception of *student aggressive behaviours*. We did not pursue the third factor as it covered a similar construct to the student measure. To derive measures from the first two factors we selected the sets of items that loaded heavily onto each factor and applied to each set of items a partial credit Rasch model (Masters, 1982). Rasch modelling was used both because of the measurement properties of the resulting scales and Rasch models' robust handling of missing data. The properties of each of these two measures are described in sections 4.3 and 4.4.

Prior to any exploratory factor analysis, a subset of items suitable for measuring student wellbeing were identified based on their content and prior use (see Lawes & Boyd, 2016). These items primarily focused on social wellbeing, but also included some which focused on emotional wellbeing.

This subset was temporarily set aside and an exploratory factor analysis was performed on the student data. Two factors were identified: one focused on student learning associated with social wellbeing, and one focused on student aggressive behaviours. Conveniently, the items loading sufficiently onto these factors were distinct from the prior set of candidate items suitable for measuring student wellbeing. At this point we had three distinct sets of items that were candidates for building measurement scales: one focused on student wellbeing; one focused on student learning associated with social wellbeing; and one focused on student aggressive behaviours. We discarded the items focused on student learning associated with social wellbeing as our research questions were focused on student wellbeing itself. We then used a partial credit Rasch model applied to the sets of items associated with student aggressive behaviours and those associated with student wellbeing to generate a measure for each of these two constructs (called *student aggressive behaviours* and *student wellbeing* respectively). Again, Rasch modelling was used both because of its measurement properties and handling of missing data. The properties of each of these two measures are described in sections 4.1 and 4.2.

The software package WINSTEPS was used for all of the Rasch modelling (Linacre, 2012).

In sections 4.1, 4.2, 4.3 and 4.4, the items contributing to each measure are listed in order of their Rasch measure, from items that respondents tended to agree with to items that respondents tended to disagree with.

4.1 The *student wellbeing* measure

For the *student wellbeing* measure, the Rasch Model person reliability statistic (a Rasch model analogue of Cronbach's Alpha, see Linacre, 2012) was 0.88 and Cronbach's Alpha (KR-20) was 0.87. The figure for Cronbach's Alpha is within the 'good' range, suggesting the items in this scale had internal consistency.

Table 2 shows, for each item in the *student wellbeing* measure, the pattern of response to the item both as a count and as a percentage.

TABLE 2 **Responses to the items in the *student wellbeing* measure**

Item – How much do you agree?	Response counts					Response percentages			
	SD	D	S	SA	NA	SD (%)	D (%)	A (%)	SA (%)
Students look after others who are new at school.	1507	6037	31718	18626	449	3	10	55	32
At school, people accept me for who I am.	1058	5216	24007	6978	21078	3	14	64	19
I feel safe at school.	1917	6652	31018	18386	364	3	11	54	32
I feel I belong at school.	1737	6762	36425	13257	156	3	12	63	23
Students get on well with other students from different cultures.	2002	8513	35577	11787	458	3	15	61	20
If other students hassle me, I know how to ignore them or walk away.	3660	7146	28921	18200	410	6	12	50	31
I can stand up for myself in a calm way.	3833	8600	30269	15239	396	7	15	52	26
If I have a problem with another student, I feel I can ask other students for help.	4787	12512	28182	12463	393	8	22	49	22
Students treat teachers with respect.	3379	16693	29304	8328	633	6	29	51	14
If I have a problem with another student, I feel I can ask teachers for help.	6179	14326	24837	12581	414	11	25	43	22
I can say how I am feeling when I need to.	5663	16155	26461	9708	350	10	28	46	17
Students include others who are being left out or ignored.	4285	18705	27375	7457	515	7	32	47	13
Students treat each other with respect.	4370	19154	28977	5328	508	8	33	50	9

Note 1: In the table, 'SD' stands for 'Strongly disagree', 'D' stands for 'Disagree', 'A' stands for 'Agree', 'SA' stands for 'Strongly agree" and 'NA' means 'No response'.

Note 2: Percentages were calculated exluding the response counts in the 'NA' column.

Table 3 shows, for each item in the *student wellbeing measure,* the Rasch item statistics for the item together with the Pearson correlation of the item with the measure. Linacre, 2012 provides detail on the Rasch item statistics.

TABLE 3 **Items and the *student wellbeing* scale**

Item – How much do you agree?	Measure (logits)	Measure SE (logits)	Infit Mean Square	Outfit mean square	Pearson correlation with scale
Students look after others who are new at school.	-0.71	0.01	0.99	0.95	0.61
At school, people accept me for who I am.	-0.6	0.01	1.01	1	0.57
I feel safe at school.	-0.57	0.01	1.01	1.03	0.6
I feel I belong at school.	-0.42	0.01	1.1	1.13	0.55
Students get on well with other students from different cultures.	-0.24	0.01	1.05	1.03	0.59
If other students hassle me, I know how to ignore them or walk away.	-0.22	0.01	1.08	1.07	0.6
I can stand up for myself in a calm way.	-0.07	0.01	1.05	1.03	0.61
If I have a problem with another student, I feel I can ask other students for help.	0.23	0.01	0.92	0.92	0.67
Students treat teachers with respect.	0.35	0.01	1.03	1.03	0.62
If I have a problem with another student, I feel I can ask teachers for help.	0.4	0.01	0.93	0.94	0.68
I can say how I am feeling when I need to.	0.52	0.01	0.96	0.97	0.67
Students include others who are being left out or ignored.	0.56	0.01	0.95	0.95	0.66
Students treat each other with respect.	0.76	0.01	0.91	0.92	0.67

Note: The infit mean square and outfit mean square are statistics that indicate how accurately or predictably data fit the model (Linacre, 2012). The infit statistic is focused on data well-targeted by the item and the outfit statistic is focused on data poorly-targeted by the item. For both the infit and outfit statistics, values between 0.5 and 1.5 are considered acceptable.

4.2 The *student aggressive behaviours* measure

The Rasch Model person reliability statistic for this scale was 0.71 and Cronbach's Alpha (KR-20) was 0.79. This value is within the 'acceptable' range for Cronbach's Alpha

Table 4 shows, for each item in the *student aggressive behaviours* measure, the pattern of response to the item both as a count and as a percentage.

TABLE 4 **Responses to the items in the *student aggressive behaviours* scale**

Item - How often does this happen?	Response counts						Response percentages				
	Never	1 or 2 times per year	1 or 2 times per month	1 or 2 times per week	Almost every day	No response	Never	1 or 2 times per year	1 or 2 times per month	1 or 2 times per week	Almost every day
Do other students put you down, call you names, or tease you in a mean way?	20364	11890	9769	9428	6259	627	35	21	17	16	11
Do other students leave you out or ignore you on purpose?	27052	12175	8555	6638	3294	623	47	21	15	12	6
Do other students tell lies or spread rumours about you?	25128	14072	8333	5750	4358	696	44	24	14	10	8
Are you bullied by other students?	32319	10669	5589	4380	3844	1536	57	19	10	8	7
Do other students say rude things about your culture or family?	34977	9769	5490	4174	3292	635	61	17	10	7	6
Do other students hit, push, or hurt you in a mean way?	36510	8659	5531	4294	2687	656	63	15	10	7	5
Do other students threaten you in a mean way, or force you to do things?	38230	8786	4703	3543	2429	646	66	15	8	6	4
Are other students rude to you because you learn in a different way from them?	40386	7481	4210	3226	2391	643	70	13	7	6	4
Do other students call you gay to put you down, or are they rude to you because of your sexuality?	29332	2728	1711	1488	1649	21429	79	7	5	4	4
Do other students say sexual things you do not like, or touch you in a way that makes you feel uncomfortable?	28557	3393	1868	1575	1534	21410	77	9	5	4	4
Do other students take or break your stuff in a mean way (e.g., money, pens)?	39872	8445	4443	2918	2034	625	69	15	8	5	4
Do other students use cellphones (like texting) or the Internet (like Facebook) to be mean to you or spread rumours?	43972	6493	3057	2103	2041	671	76	11	5	4	4

Note: The percentages were calculated exluding the response counts in the 'No response' column.

Table 5 shows, for each item in the *student aggressive behaviours* measure, the Rasch item statistics for the item together with the Pearson correlation of the item with the measure.

TABLE 5 **Items and the *student aggressive behaviours* scale**

Item - How often does this happen?	Measure (logits)	Measure SE (logits)	Infit Mean Square	Outfit mean square	Pearson correlation with scale
Do other students put you down, call you names, or tease you in a mean way?	-2.34	0.01	0.97	1.00	0.87
Do other students leave you out or ignore you on purpose?	-1.38	0.01	1.29	1.22	0.81
Do other students tell lies or spread rumours about you?	-0.59	0.01	0.9	0.84	0.62
Are you bullied by other students?	-0.21	0.02	0.89	0.81	0.60
Do other students say rude things about your culture or family?	0.03	0.02	0.97	1.02	0.56
Do other students hit, push, or hurt you in a mean way?	0.16	0.02	0.89	0.77	0.58
Do other students threaten you in a mean way, or force you to do things?	0.45	0.02	0.86	0.72	0.56
Are other students rude to you because you learn in a different way from them?	0.56	0.02	0.91	0.79	0.54
Do other students call you gay to put you down, or are they rude to you because of your sexuality?	0.70	0.02	1.00	0.92	0.52
Do other students say sexual things you do not like, or touch you in a way that makes you feel uncomfortable?	0.72	0.02	1.10	1.64	0.48
Do other students take or break your stuff in a mean way (e.g., money, pens)?	0.79	0.02	1.01	1.16	0.50
Do other students use cellphones (like texting) or the Internet (like Facebook) to be mean to you or spread rumours?	1.10	0.02	1.03	1.08	0.47

Note: The infit mean square and outfit mean square are statistics described in the footnote to Table 3.

4.3 The *teaching for wellbeing* measure

The Rasch Model person reliability statistic for this scale was 0.90 and Cronbach's Alpha (KR-20) was 0.95. This value is within the 'excellent' range for Cronbach's Alpha.

Table 6 shows, for each item in the *teaching for wellbeing* measure, the pattern of response to the item both as a count and as a percentage.

TABLE 6 **Responses to the items in the *teaching for wellbeing* scale**

Item - How much do you agree?	Response counts					Response percentages			
	SD	D	S	SA	NA	SD (%)	D (%)	A (%)	SA (%)
I frequently praise students for helpful and caring behaviour.	3	77	1407	1869	70	0	2	42	56
I create a strong sense of trust and community in my classes.	6	59	1743	1525	93	0	2	52	46
I tailor teaching materials to students' skills, needs, and backgrounds.	5	99	1865	1358	99	0	3	56	41
I give students regular formative feedback.	5	109	1875	1352	85	0	3	56	40
I use cooperative learning strategies in ways that build students' capacity to relate well to others.	10	207	1928	1173	108	0	6	58	35
I ask students for their ideas about how to improve the classroom or school social climate.	49	489	2014	753	121	1	15	61	23
Classroom or form teachers work with students to develop a charter or commitment to a shared set of class values or behaviours.	76	468	1846	923	113	2	14	56	28
Students are taught strategies for managing their feelings and emotions in non-confrontational ways (e.g., using "I" statements).	76	684	1813	754	99	2	21	54	23
Students explore the social norms of different cultures.	60	795	1891	581	99	2	24	57	17
I encourage all students to set goals that develop their skills in relating to others.	92	794	1682	735	123	3	24	51	22
I use classroom discussion time (e.g., form time or circle time) for students to share and resolve any concerns they have.	130	782	1679	703	132	4	24	51	21
My curriculum or lesson plans include a focus on the social and behavioural skills this school would like students to develop.	114	762	1813	609	128	3	23	55	18
I make use of visual resources (e.g., DVDs) to support students to discuss and develop effective strategies for relating to others.	184	949	1548	625	120	6	29	47	19
Students are taught ways of intervening in conflict or bullying incidents to support each other.	159	1000	1788	368	111	5	30	54	11
Students learn and practice strategies they could use to resolve conflicts (e.g., how to deal with cyber-bullying or hold a restorative conversation).	167	1095	1682	364	118	5	33	51	11
I use role play or drama activities to support students to develop and practise effective strategies for relating to others.	309	1250	1382	367	118	9	38	42	11
I regularly set up learning experiences that enable students to be actively involved citizens (e.g., documenting history through interviewing senior citizens, doing environmental projects, or working to support disaster appeals).	269	1467	1233	307	150	8	45	38	9
Students are taught how to recognise the four different types of bullying behaviours, and sexual harassment.	286	1589	1204	222	125	9	48	36	7

Note 1: In the table, 'SD' stands for 'Strongly disagree', 'D' stands for 'Disagree', 'A' stands for 'Agree', 'SA' stands for 'Strongly agree" and 'NA' means 'No response'.

Note 2: Percentages were calculated exluding the response counts in the 'NA' column.

Table 7 shows, for each item in the *teaching for wellbeing* measure, the Rasch item statistics for the item together with the Pearson correlation of the item with the measure.

TABLE 7 **Items and the *teaching for wellbeing* scale**

Item – How much do you agree?	Measure (logits)	Measure SE (logits)	Infit Mean Square	Outfit mean square	Pearson correlation with scale
I frequently praise students for helpful and caring behaviour.	-2.42	0.04	1.03	1.01	0.51
I create a strong sense of trust and community in my classes.	-1.80	0.04	1.01	1.04	0.52
I tailor teaching materials to students' skills, needs, and backgrounds.	-1.73	0.04	1.04	1.03	0.52
I give students regular formative feedback.	-1.71	0.04	1.06	1.07	0.51
I use cooperative learning strategies in ways that build students' capacity to relate well to others.	-1.22	0.04	0.89	0.86	0.62
I ask students for their ideas about how to improve the classroom or school social climate.	-0.12	0.03	1.00	0.99	0.6
Classroom or form teachers work with students to develop a charter or commitment to a shared set of class values or behaviours.	-0.06	0.03	1.04	1.01	0.60
Students are taught strategies for managing their feelings and emotions in non-confrontational ways (e.g., using "I" statements).	0.16	0.03	0.84	0.82	0.69
Students explore the social norms of different cultures.	0.24	0.03	1.12	1.12	0.56
I encourage all students to set goals that develop their skills in relating to others.	0.29	0.03	0.90	0.88	0.68
I use classroom discussion time (e.g., form time or circle time) for students to share and resolve any concerns they have.	0.46	0.03	1.03	1.04	0.63
My curriculum or lesson plans include a focus on the social and behavioural skills this school would like students to develop.	0.48	0.03	0.91	0.92	0.67
I make use of visual resources (e.g., DVDs) to support students to discuss and develop effective strategies for relating to others.	0.75	0.03	1.16	1.20	0.58
Students are taught ways of intervening in conflict or bullying incidents to support each other.	0.99	0.03	0.88	0.88	0.68
Students learn and practice strategies they could use to resolve conflicts (e.g., how to deal with cyber-bullying or hold a restorative conversation).	1.05	0.03	0.88	0.89	0.69
I use role play or drama activities to support students to develop and practise effective strategies for relating to others.	1.40	0.03	1.01	1.03	0.65
I regularly set up learning experiences that enable students to be actively involved citizens (e.g., documenting history through interviewing senior citizens, doing environmental projects, or working to support disaster appeals).	1.50	0.03	1.12	1.12	0.61
Students are taught how to recognise the four different types of bullying behaviours, and sexual harassment.	1.75	0.03	1.06	1.06	0.63

Note that the infit mean square and outfit mean square are statistics described in the footnote to Table 3.

4.4 The *school-wide actions* measure

The Rasch Model person reliability statistic for this scale was 0.94 and Cronbach's Alpha (KR-20) was 0.96. This value is within the 'excellent' range for Cronbach's Alpha.

Table 8 shows, for each item in the *school-wide actions* measure, the pattern of response to the item both as a count and as a percentage.

TABLE 8 **Responses to the items in the *school-wide actions***

Item - How much do you agree?	Response counts					Response percentages			
	SD	D	S	SA	NA	SD (%)	D (%)	A (%)	SA (%)
Students' successes are shared widely (e.g., at assemblies, during staff meetings, in newsletters).	26	249	1573	1566	12	1	7	46	46
We listen to, and take action to address, the concerns of parents and whānau.	33	243	2156	928	66	1	7	64	28
School leaders promote the school as a caring and culturally inclusive community.	64	280	1807	1262	13	2	8	53	37
All teachers are learners at this school.	62	364	1698	1264	38	2	11	50	37
We have effective support systems for students with special learning needs.	68	435	1860	1034	29	2	13	55	30
Staff treat each other with respect.	55	546	1975	838	12	2	16	58	25
We actively address student behaviours such as harassment, violence, bullying, and cyber-bullying.	78	431	1903	978	36	2	13	56	29
Professional learning provides opportunities for teachers to work together to develop, trial, and refine new approaches.	81	436	1884	974	51	2	13	56	29
We share the school expectations of behaviour with parents and whānau.	63	416	2118	763	66	2	12	63	23
Students are treated as responsible citizens who have a say in what happens.	49	496	2196	650	35	1	15	65	19
School leaders encourage staff to share ideas rather than compete with each other.	115	484	1693	1113	21	3	14	50	33
We select new approaches or programmes based on student data and needs.	74	459	2101	727	65	2	14	63	22
We provide a safe social and physical workplace for staff.	109	467	2007	822	21	3	14	59	24
We have effective systems for referring students with behavioural concerns (if necessary).	94	594	2030	664	44	3	18	60	20
Staff have a strong sense of belonging.	118	724	1762	805	17	3	21	52	24
We have school-wide guidelines that help us recognise and address student behaviour incidents of differing severity.	128	646	1818	789	45	4	19	54	23
Staff share a strong collective vision.	90	670	2072	582	12	3	20	61	17
We have a school-wide behaviour management policy or procedure that is easy for our school community to understand.	147	700	1671	865	43	4	21	49	26
We provide extra support for students who are the target of bullying or harassment (e.g., counselling).	77	726	2011	540	72	2	22	60	16
We offer effective support and programmes for students with social or behavioural needs (e.g., anger management sessions).	91	804	1938	546	47	3	24	57	16
The leadership team works collaboratively with staff to set school directions.	198	743	1739	724	22	6	22	51	21
Professional learning enables teachers to observe their colleagues modelling new practices.	135	905	1796	534	56	4	27	53	16
Staff approach new developments or problems as a team.	137	895	1882	476	36	4	26	56	14
We seek input from all key stakeholders (staff, students, parents and whānau) when we are making changes.	183	932	1749	515	47	5	28	52	15
Behaviour management policies or procedures are applied consistently and fairly to all students.	210	893	1747	530	46	6	26	52	16
We actively address staff workplace harassment and bullying.	233	878	1695	557	63	7	26	50	17
When we start new approaches, school leaders make sure all staff have enough information and training.	228	987	1724	439	48	7	29	51	13

Note 1: In the table, 'SD' stands for 'Strongly disagree', 'D' stands for 'Disagree', 'A' stands for 'Agree', 'SA' stands for 'Strongly agree" and 'NA' means 'No response'.
Note 2: Percentages were calculated exluding the response counts in the 'NA' column.

Table 9 shows, for each item in the *school-wide actions* measure, the Rasch item statistics for the item together with the Pearson correlation of the item with the measure.

TABLE 9 **Items and the *school-wide actions* measure**

Item – How much do you agree?	Measure (logits)	Measure SE (logits)	Infit Mean Square	Outfit mean square	Pearson correlation with scale
Students' successes are shared widely (e.g., at assemblies, during staff meetings, in newsletters).	-1.21	0.03	1.21	1.30	0.51
We listen to, and take action to address, the concerns of parents and whānau.	-0.73	0.04	0.98	0.98	0.61
School leaders promote the school as a caring and culturally inclusive community.	-0.66	0.03	0.87	0.84	0.67
All teachers are learners at this school.	-0.62	0.03	1.17	1.14	0.56
We have effective support systems for students with special learning needs.	-0.41	0.03	1.17	1.14	0.57
Staff treat each other with respect.	-0.32	0.03	1.15	1.19	0.57
We actively address student behaviours such as harassment, violence, bullying, and cyber-bullying.	-0.32	0.03	0.91	0.89	0.67
Professional learning provides opportunities for teachers to work together to develop, trial, and refine new approaches.	-0.30	0.03	0.90	0.87	0.67
We share the school expectations of behaviour with parents and whānau.	-0.25	0.03	1.12	1.15	0.57
Students are treated as responsible citizens who have a say in what happens.	-0.23	0.04	1.00	0.98	0.62
School leaders encourage staff to share ideas rather than compete with each other.	-0.22	0.03	0.90	0.93	0.68
We select new approaches or programmes based on student data and needs.	-0.14	0.03	0.90	0.87	0.67
We provide a safe social and physical workplace for staff.	-0.04	0.03	0.89	0.87	0.68
We have effective systems for referring students with behavioural concerns (if necessary).	0.07	0.03	0.92	0.89	0.67
Staff have a strong sense of belonging.	0.10	0.03	0.93	0.96	0.68
We have school-wide guidelines that help us recognise and address student behaviour incidents of differing severity.	0.12	0.03	1.04	1.03	0.64
Staff share a strong collective vision.	0.16	0.03	0.90	0.90	0.67
We have a school-wide behaviour management policy or procedure that is easy for our school community to understand.	0.16	0.03	1.05	1.06	0.65
We provide extra support for students who are the target of bullying or harassment (e.g., counselling).	0.16	0.03	1.22	1.23	0.54
We offer effective support and programmes for students with social or behavioural needs (e.g., anger management sessions).	0.27	0.03	1.01	1.00	0.64
The leadership team works collaboratively with staff to set school directions.	0.42	0.03	0.84	0.86	0.72
Professional learning enables teachers to observe their colleagues modelling new practices.	0.49	0.03	1.22	1.24	0.57
Staff approach new developments or problems as a team.	0.56	0.03	0.86	0.85	0.71
We seek input from all key stakeholders (staff, students, parents and whānau) when we are making changes.	0.66	0.03	0.95	0.95	0.68
Behaviour management policies or procedures are applied consistently and fairly to all students.	0.70	0.03	0.90	0.89	0.71
We actively address staff workplace harassment and bullying.	0.71	0.03	0.99	1.02	0.67
When we start new approaches, school leaders make sure all staff have enough information and training.	0.88	0.03	0.88	0.89	0.71

Note: The infit mean square and outfit mean square are statistics described in the footnote to Table 3.

5.
Multilevel models

Earlier work (Lawes & Boyd, 2016) and an initial exploration of the data suggested that many of the factors associated with differences in wellbeing and aggressive behaviours in the literature (for example, Ministry of Education, 2017) also appeared to have similar associations in our wellbeing data. Table 10 shows the distributions of student wellbeing and student aggressive behaviours by some student characteristics (gender, ethnic group and year level) and school characteristics (school decile groupings).

TABLE 10 **The distribution of *student wellbeing* and *student aggressive behaviours***

Factor		Merged school and teacher data					
		Student count	Mean *student wellbeing* score (logits)	SD *student wellbeing* score (logits)	Mean *student aggressive behaviours* score (logits)	SD *student aggressive behaviours* score (logits)	Bullying prevalence (%)
All students		20194	0.99	1.51	-3.27	2.22	13%
Gender	Girls	11439	0.95	1.48	-3.52	2.1	11%
	Boys	8827	1.04	1.55	-2.96	2.32	15%
Ethnic group	NZ European or Other	12915	0.90	1.46	-3.35	2.10	12%
	Māori	4177	0.91	1.6	-3.13	2.40	16%
	Pasifika	3023	1.29	1.66	-2.94	2.50	17%
	Asian	3128	1.06	1.65	-2.99	2.35	17%
Decile	Low (1,2 or 3)	3359	1.33	1.62	-2.80	2.37	20%
	Med (4,5, 6 or 7)	8563	0.9	1.56	-3.11	2.3	14%
	High (8,9 or 10)	8438	0.94	1.40	-3.63	2.00	9%
Year level	5	2608	1.80	1.58	-2.83	2.25	19%
	6	2572	1.55	1.46	-3.10	2.14	16%
	7	3223	1.25	1.54	-3.07	2.23	16%
	8	3291	0.96	1.45	-3.13	2.19	13%
	9	1999	0.65	1.35	-3.33	2.16	12%
	10	2047	0.29	1.29	-3.25	2.27	11%
	11	1789	0.45	1.30	-3.83	2.17	7%
	12	1607	0.48	1.32	-3.78	2.15	7%
	13	1224	0.63	1.30	-3.97	2.07	6%

Note 1: Higher wellbeing scores indicate greater wellbeing (a positive outcome) whereas higher student aggressive behaviours scores indicate higher reported levels of student aggressive behaviours (a negative outcome).

Note 2: Bullying prevalence is the proportion of all students who report being bullied at least weekly (and satisfy the conditions of membership in the row in Table 10).

Note 3: The NZ European and Other ethnic groups are merged here to enable comparison with Table 11 and Table 12 where there were no significant differences in model outcomes between these two ethnic groups.

It is worth noting that the bullying prevalence indicator for all students reported in Table 10 (13%) is slightly different to the 15% reported in Lawes and Boyd (2017). This is because in Lawes and Boyd (2017), the figure was calculated as an average of the per-school bullying prevalence figures across a number of large schools. It is also worth noting that Table 10 indicates substantial difference in bullying between NZ European and Māori or Pasifika students. As Table 12 later suggests, these differences are explained by other factors. After accounting for these factors, Māori or Pasifika students are no more or less likely to experience student aggressive behaviours than NZ European students.

Following our initial explorations, we used multilevel linear models to summarise the features of the Wellbeing@School data and address our research questions. Multilevel linear models are applicable to data in which one unit of analysis is grouped within another—for example, when student data is grouped within school data. As described in section 3.2, this was the case for the merged student and teacher data

set where student records were also associated with data from the school they attended (in the form of decile information and averaged teacher data for the teachers at that school).

Multilevel models seek to specify the value of a dependent variable (such as *student wellbeing* or *student aggressive behaviours*), based on the values of the independent variables (such as school characteristics and student characteristics) where some of the variables vary according to one unit of analysis (such as school characteristics) and other variables vary according to another unit of analysis (such as student characteristics).

When making inferences from a statistical model of multilevel data, there is less chance of making a type I error (reporting a relationship when there is insufficient evidence to support this) than when using a single-level model. This is because single-level models tend to underestimate the variance that occurs at higher data levels—variance that multilevel models explicitly incorporate (e.g. Raudenbush & Bryk, 2002). Because our data set is large and there is little risk of undercoverage, we did not use weighting or resampling methods.

Our research questions required that our multilevel models would at least have 'random intercepts'. So-called random-intercept models account for variation of the base estimate of the dependent variable at one data level (the intercept) by the groupings at higher data levels. In our context this means that the models are required to account for the way that *student wellbeing* scale score (a student-level variable) varies by school. Because our analytical approach was exploratory, and to avoid interpretational complexity, we did not incorporate any further multilevel modelling techniques (such as 'random slopes') into our models.

5.1 A modelling approach

For *student wellbeing* and *student aggressive behaviours*, we fitted four 2-level random intercept models to the merged student and teacher wellbeing data (see, for example, Finch et al., 2014). We refer to these as the null model, and models 1, 2 and 3. Model 1 included student level demographic characteristics and also school decile groupings at the school level. Model 2 supplemented these with *teaching for wellbeing* at the school level. Model 3 in turn supplemented this with *school-wide actions* at the school level. We followed the same process for *student aggressive behaviours*.

We used several models simultaneously to understand *student wellbeing* and *student aggressive behaviours*. This allowed us to explore the extent to which school policies and practices explained the apparent associations between student characteristics, school decile and our outcome measures.

For all of our models:

- *WB* represents *student wellbeing*
- *Agg* epresents *student aggressive behaviours*.
- *Year* represents student year level—it is a count of year levels above year 4. That is, it represents year 5 as 1, year 6 as 2, year 7 as 3, and so on.
- *Boy* represents student identification as a boy.
- *M, P and A* represent student identification with the Māori, Pasifika, and Asian ethnic groups respectively.
- *Mid-dec* and *High-dec* represent school membership of decile 4, 5, 6 or 7 (indicating mid-level SES), or decile 8, 9, or 10 (indicating high SES) respectively.
- *Teach* represents the average value of *teaching for wellbeing* for all of the teachers at a given school.
- *School-wide* represents the average value of *school-wide actions* for all of the teachers at a given school.
- *e* represents random error in the modelling of either or at the student level.
- u_0 represents random error in the modelling of either or at the school level.

For clarity, we suppress the traditional representation of: student-level variables with an additional subscript of (they vary by student and school); and student-level parameters and school-level variables with an additional subscript of (they vary by school).

We used the software environment R (R Core Team, 2016) for all of our statistical analysis and, in particular, for multilevel modelling we used the R package 'lme4' developed by Bates et al. (2015) and described in Finch, Bolin, and Kelley (2014).

The null model

At the student level the null model for *student wellbeing* has equation:

$WB=\beta_0+e$

At the school level the null model for *student wellbeing* has equation:

$\beta_0=\gamma_{00}+u_0$

Here:

β_0 represents the average *student wellbeing* scale score for a school.

γ_{00} represents the average *student wellbeing* scale score for all schools.

Our modelling process provided us with estimates of these parameters. The null model for *student aggressive behaviours* are analogous to those above (with *Agg* replacing *WB* and '*aggressive behaviours*' replacing '*wellbeing*').

Models 1, 2, and 3

Exploratory analyses suggested that *student wellbeing* and *student aggressive behaviours* varied linearly with our explanatory factors. At the student level, models 1, 2, and 3 for *student wellbeing* had equation:

$WB=\beta_0+\beta_1 Year+\beta_2 Boy+\beta_3 M+\beta_4 P+\beta_5 A+e$

At the school level, model 1 had equation:

$\beta_0=\gamma_{00}+\gamma_{01} Mid\text{-}dec+\gamma_{02} High\text{-}dec+u_0$

At the school level, model 2 had equation:

$\beta_0=\gamma_{00}+\gamma_{01} Mid\text{-}dec+\gamma_{02} High\text{-}dec+\gamma_{03} Teach+u_0$

And at the school level, model 3 had equation:

$\beta_0=\gamma_{00}+\gamma_{01} Mid\text{-}dec+\gamma_{02} High\text{-}dec+\gamma_{03} Teach+\gamma_{04} School\text{-}wide+u_0$

Here:

β_0 represents the average *student wellbeing* scale score for NZ European girls in Year 4 at a school.

β_1 represents the average change in *student wellbeing* scale score associated with a unit change in year level.

β_2, β_3, β_4, β_5, represent the average differences in *student wellbeing* scale score associated with student identification as a boy, Māori, Pasfika, or Asian ethnic group respectively.

γ_{00} represents the average *student wellbeing* scale score of a decile 1, 2, or 3 school.

γ_{01}, γ_{02} r epresent the average differences in *student wellbeing* scale score associated with student attendance at a decile 4, 5, 6, or 7 school and a decile 8, 9, or 10 school respectively.

γ_{03}, γ_{04} represent the average change in *student wellbeing* scale score associated with a unit change in *teaching for wellbeing* and *school-wide actions* repectively

Models 1, 2 and 3 for *student aggressive behaviours* are analogous to those above (with *Agg* replacing *WB* and '*aggressive behaviours*' replacing '*wellbeing*').

5.2 Models of *student wellbeing*

Table 11 displays the parameter estimates of our models of *student wellbeing*.

TABLE 11 **Models of *student wellbeing***

Effect		Null Model			Model 1			Model 2			Model 3		
		Estimate	Std. Error	Signif.	Estimate	Std. Error	Signif.	Estimate	Std. Error	Signif.	Estimate	Std. Error	Signif.
	Intercept	1.263	0.052	1	2.108	0.098	1	1.935	0.111	1	1.686	0.137	1
Student level	Gender (male)	NA	NA	0	-0.035	0.022	5	-0.035	0.022	5	-0.035	0.022	5
	Māori	NA	NA	0	-0.094	0.026	1	-0.092	0.026	1	-0.09	0.026	1
	Pasifika	NA	NA	0	0.151	0.033	1	0.154	0.033	1	0.15	0.033	1
	Asian	NA	NA	0	-0.044	0.028	5	-0.042	0.028	5	-0.043	0.028	5
	Year level	NA	NA	0	-0.099	0.007	1	-0.097	0.007	1	-0.096	0.007	1
School level	School decile 4-7	NA	NA	0	-0.219	0.103	3	-0.218	0.099	3	-0.156	0.098	5
	School decile 8-10	NA	NA	0	-0.046	0.108	5	-0.103	0.106	5	-0.069	0.103	5
	School-wide actions	NA	NA	0	NA	NA	0	0.114	0.035	2	0.018	0.047	5
	Teaching for wellbeing	NA	NA	0	NA	NA	0	NA	NA	0	0.207	0.069	2
Variance	School level	0.302	NA	NA	0.163	NA	NA	0.149	NA	NA	0.138	NA	NA
	Residual	1.968	NA	NA	1.952	NA	NA	1.952	NA	NA	1.952	NA	NA

Note: Significance value 1 means Pr(>|t|)<0.001, value 2 means Pr(>|t|)<0.01, value 3 means Pr(>|t|)<0.05, value 4 means Pr(>|t|)<0.1, and value 5 means Pr(>|t|)<1.

As an example of how to interpret the estimates in Table 11, suppose we wanted to estimate the average student wellbeing measure for Year 7 Pasifika girls at decile 1–3 schools for which we didn't know the *school-wide actions* and *teaching for wellbeing values*. We would use model 1 (as it doesn't involve school-wide actions or *teaching for wellbeing*). We would then simply add:

- the intercept estimate (2.108 logits) representing the average student wellbeing measure for Year 4 NZ European or Other girls at decile 1–3 schools
- the coefficient associated with identification as Pasifika (0.151 logits)
- twice the coefficient for year level (twice -0.099 logits)) representing the effect of 2 years above year level 5.

This is 2.108+0.151+2×-0.099=2.061 logits.

5.3 Models of *student aggressive behaviours*

Table 12 displays the parameter estimates of our models of *student aggressive behaviours*.

TABLE 12 **Models of *student aggressive behaviours***

Effect		Null Model			Model 1			Model 2			Model 3		
		Estimate	Std. Error	Signif.	Estimate	Std. Error	Signif.	Estimate	Std. Error	Signif.	Estimate	Std. Error	Signi.
	Intercept	-3.141	0.053	1	-2.005	0.124	1	-1.842	0.143	1	-1.897	0.18	1
Student level	Gender (male)	NA	NA	0	0.282	0.034	1	0.282	0.034	1	0.282	0.034	1
	Māori	NA	NA	0	0.011	0.04	5	0.008	0.04	5	0.009	0.04	5
	Pasifika	NA	NA	0	0.039	0.051	5	0.037	0.051	5	0.035	0.051	5
	Asian	NA	NA	0	0.278	0.043	1	0.276	0.043	1	0.276	0.043	1
	Year level	NA	NA	0	-0.143	0.01	1	-0.147	0.01	1	-0.146	0.01	1
School level	School decile 4-7	NA	NA	0	-0.208	0.121	4	-0.21	0.12	4	-0.197	0.123	5
	School decile 8-10	NA	NA	0	-0.551	0.127	1	-0.501	0.128	1	-0.493	0.13	1
	School-wide actions	NA	NA	0	NA	NA	0	-0.098	0.043	3	-0.119	0.06	3
	Teaching for wellbeing	NA	NA	0	NA	NA	0	NA	NA	0	0.044	0.086	5
Variance	School level	0.281	NA	NA	0.197	NA	NA	0.193	NA	NA	0.194	NA	NA
	Residual	4.625	NA	NA	4.549	NA	NA	4.548	NA	NA	4.548	NA	NA

Note: Significance value 1 means Pr(>|t|)<0.001, value 2 means Pr(>|t|)<0.01, value 3 means Pr(>|t|)<0.05, value 4 means Pr(>|t|)<0.1, and value 5 means Pr(>|t|)<1.

The estimates in Table 11 can be interpreted similarly to those in Table 12.

6.
Specific policies and practices

Our first research question asks whether there are school practices associated with higher levels of *student wellbeing* or lower levels of *student aggressive behaviours*. The measures *teaching for wellbeing* and school-wide actions describe types of school practices, but many of the items that make up these measures describe much more specific practices. This section explores the extent to which we can determine a relationship between these specific practices and each of *student wellbeing* and *student aggressive behaviours*.

6.1 Specific policies and practices and *student wellbeing*

Table 11 suggests that there is a strong relationship between *teaching for wellbeing* and *student wellbeing*. This aspect of Table 11 is explained fully in section 7, but in the current section we explore the relationship between *student wellbeing* and the component items comprising the *teaching for wellbeing* measure. Our intent here was to be able to identify some specific teacher practices or actions associated with *student wellbeing* for all students, for Māori students, and for Pasifika students.

Table 13 shows the average prevalence of the practice described by the item at schools in the data with more than 10 teacher respondents and more than 100 student respondents. This prevalence is computed for a school as the percentage of teacher respondents at the school who agreed or strongly agreed that they undertake the practice described by the item. Table 13 also shows the Pearson correlation between items in the *teaching for wellbeing* measure and the *student wellbeing* measure for all students, for Māori students, and for Pasifika students. Table 13 is ordered by the Pearson correlation for all students.

TABLE 13 **Relationship between items in the *teaching for wellbeing* measure and the *student wellbeing* measure**

Item in the *teaching for wellbeing* scale	Practice prevalence (%)	Pearson correlation with the *student wellbeing* measure - All students	Pearson correlation with the *student wellbeing* measure - Māori students	Pearson correlation with the *student wellbeing* measure - Pasifika students
Students are taught strategies for managing their feelings and emotions in non-confrontational ways (e.g., using "I" statements).	78%	0.25	0.24	0.19
I use role play or drama activities to support students to develop and practise effective strategies for relating to others.	53%	0.25	0.25	0.22
Classroom or form teachers work with students to develop a charter or commitment to a shared set of class values or behaviours.	86%	0.25	0.25	0.22
Students are taught ways of intervening in conflict or bullying incidents to support each other.	66%	0.23	0.22	0.18
I frequently praise students for helpful and caring behaviour.	97%	0.21	0.21	0.14
I tailor teaching materials to students' skills, needs, and backgrounds.	97%	0.21	0.22	0.19
My curriculum or lesson plans include a focus on the social and behavioural skills this school would like students to develop.	73%	0.21	0.19	0.18
I use classroom discussion time (e.g., form time or circle time) for students to share and resolve any concerns they have.	74%	0.21	0.20	0.19
Students learn and practice strategies they could use to resolve conflicts (e.g., how to deal with cyber-bullying or hold a restorative conversation).	65%	0.2	0.16	0.13
I use cooperative learning strategies in ways that build students' capacity to relate well to others.	93%	0.19	0.20	0.15
I encourage all students to set goals that develop their skills in relating to others.	73%	0.19	0.16	0.16
I create a strong sense of trust and community in my classes.	98%	0.19	0.21	0.15
I regularly set up learning experiences that enable students to be actively involved citizens (e.g., documenting history through interviewing senior citizens, doing environmental projects, or working to support disaster appeals).	50%	0.15	0.11	0.13
I give students regular formative feedback.	97%	0.15	0.14	0.12
Students are taught how to recognise the four different types of bullying behaviours, and sexual harassment.	43%	0.15	0.13	0.15
Students explore the social norms of different cultures.	74%	0.13	0.09	0.09
I make use of visual resources (e.g., DVDs) to support students to discuss and develop effective strategies for relating to others.	66%	0.13	0.08	0.10
I ask students for their ideas about how to improve the classroom or school social climate.	85%	0.13	0.10	0.13

6.2 Specific policies and practices and *student aggressive behaviours*

Table 12 suggests that there is a strong relationship between *school-wide actions* and *student aggressive behaviours*. This aspect of Table 12 is explained fully in section 7. Our initial intent in this section was to be able to identify some specific school practices or actions associated with lowering *student aggressive behaviours*. However, when we carried out an analysis similar to that in section 6.1, we found that the values of Pearson's correlation between a number of the individual items making up the *school-wide actions* measure and the *student aggressive behaviours* measure were too low to be meaningful.

In Table 14 we simply report the average prevalence of the practice described by the item at schools with more than 10 teacher respondents and more than 100 student respondents (that is, schools from which we had enough data to calculate an average of teacher responses). This prevalence is computed for a school as the average percentage of teacher respondents at the school who agreed or strongly agreed that they undertook each practice.

We did not achieve our objective of identifying some specific school practices or actions associated with lowering *student aggressive behaviours*. However, Table 14 shows the prevalence of practices broadly associated with lowering *student aggressive behaviours*.

TABLE 14 **Action prevalence for items in the *school-wide actions* measure**

Item in the *school-wide actions* scale	**Practice prevalence (%)**
We listen to, and take action to address, the concerns of parents and whānau.	93%
School leaders promote the school as a caring and culturally inclusive community.	92%
Students' successes are shared widely (e.g., at assemblies, during staff meetings, in newsletters).	91%
We have effective support systems for students with special learning needs.	86%
We select new approaches or programmes based on student data and needs.	85%
We actively address student behaviours such as harassment, violence, bullying, and cyber-bullying.	85%
Students are treated as responsible citizens who have a say in what happens.	85%
Professional learning provides opportunities for teachers to work together to develop, trial, and refine new approaches.	84%
Staff treat each other with respect.	82%
We have effective systems for referring students with behavioural concerns (if necessary).	80%
Staff share a strong collective vision.	80%
We have school-wide guidelines that help us recognise and address student behaviour incidents of differing severity.	77%
Staff have a strong sense of belonging.	76%
We have a school-wide behaviour management policy or procedure that is easy for our school community to understand.	75%
We provide extra support for students who are the target of bullying or harassment (e.g., counselling).	75%
We offer effective support and programmes for students with social or behavioural needs (e.g., anger management sessions).	74%
The leadership team works collaboratively with staff to set school directions.	73%
Staff approach new developments or problems as a team.	71%
We seek input from all key stakeholders (staff, students, parents and whānau) when we are making changes.	68%
We actively address staff workplace harassment and bullying.	68%
Behaviour management policies or procedures are applied consistently and fairly to all students.	68%
Professional learning enables teachers to observe their colleagues modelling new practices.	67%
When we start new approaches, school leaders make sure all staff have enough information and training.	66%

7. Conclusions

In this section we present interpreted summaries of Table 11, Table 12, Table 13, and Table 14. These interpretations were presented in a slightly different order (organised according to our research questions) in the summary at the beginning of this report.

7.1 *Student wellbeing*

The null model in section 5.2 indicates that *student wellbeing* varies substantially, with between-school variation making up a smaller proportion than within-school variation of the total variation.

Models 1, 2 and 3 in section 5.2 indicate that, after accounting student and school characteristics:

- Boys' wellbeing was no different to girls' wellbeing.
- On average, older students had lower wellbeing levels than younger students.
- On average, Pasifika students had higher wellbeing levels than NZ European, Asian, and Other students. On average, Māori students had the lowest levels of wellbeing.
- On average, the wellbeing levels of students at decile 4–7 schools was lower than the wellbeing levels of students at other schools.
- On average, students at schools where teachers actively taught for wellbeing had higher wellbeing levels than students at other schools.
- On average, students at schools with a broad range of school-wide policies and practices in place to promote wellbeing had higher wellbeing levels than students at other schools.
- The extent to which teachers at a school actively taught for wellbeing was a better predictor of student wellbeing than the extent to which the school had school-wide policies and practices in place to promote wellbeing.

Table 13 in section 6.1 allows us to identify a range of specific policies or practices that have higher correlations with *student wellbeing*. On the whole, the practices that supported *student wellbeing* were similar across different groups of students—all students, *M*āori students, and Pasifika students. Some of these practices were common across schools. Others were less common, suggesting they could be an area for development. In particular, three practices with higher levels of correlation were reported by two-thirds or fewer of teachers:

- I use role play or drama activities to support students to develop and practise effective strategies for relating to others.
- Students are taught ways of intervening in conflict or bullying incidents to support each other.
- Students learn and practice strategies they can use to resolve conflicts.

The table also suggests that teachers creating a strong sense of trust and community in their classes was a specific practice with a higher relative correlation with *student wellbeing* for Māori students.

Finally, Table 13 suggests that teachers encouraging students to set goals that develop their skills in relating to others was a specific practice with a slightly higher relative correlation with *student wellbeing* for Pasifika students.

7.2 Student aggressive behaviours

The null model in section 5.3 indicates that *student aggressive behaviour* varies substantially, with between-school variation making up a smaller proportion than within-school variation of the total variation.

Models 1, 2, and 3 in section 5.3 indicate that, after accounting for student and school characteristics:

- Boys were more likely to report experiencing aggressive behaviours than girls.
- Older students were less likely to report experiencing aggressive behaviours than younger students.
- Asian students were more likely to report experiencing aggressive behaviours than Pasifika, Māori, NZ European, and Other students. These groups reported similar levels of aggressive behaviours.
- Overall, students at decile 8–10 schools were less likely to report experiencing aggressive behaviours than students at other schools.
- Overall, students at schools with a broad range of school-wide policies and practices in place to promote wellbeing were less likely to report experiencing aggressive behaviours than students at other schools.
- Students at schools actively teaching for wellbeing were no more or less likely to report experiencing aggressive behaviours than students at other schools.

Table 14 in section 6.2 shows a range of school policies and practices that are broadly linked with lower levels of *student aggressive behaviours*. Unlike our findings for *teaching for wellbeing*, none of these policies or practices stood out individually as being particularly associated with lower levels of *student aggressive behaviour*. This suggests that a combination of practices is important rather than isolated actions.

Some of these policies and practices were common across schools. Others were less common, suggesting they could be an area for development. In particular, five practices were reported by 70% or fewer teachers:

- When starting new approaches, school leaders make sure all staff have enough information and training.
- Professional learning enabling teachers to observe their colleagues modelling new practices.
- Behaviour management policies or procedures being applied consistently and fairly to all students.
- Actively addressing staff workplace harassment and bullying.
- Seeking input from all key stakeholders (staff, students, parents and whānau) when making changes.

8.
Limitations and possibilities

In this section we reflect on several limitations of the research as well as future possibilities.

The research described in this report used data collected for a self-review tool. It therefore inherited the ethical and administrative constraints required by this kind of tool—constraints that are different to those of purposively collected research data.

For example, in the Wellbeing@School data it is not possible to link student data directly to the data of their teachers—instead they are linked via their school. There are sound reasons for this kind of arrangement in a self-review tool. However, from a statistical perspective it would be useful if student data could be linked directly to the data of their teacher(s). In this case, we would not have needed to aggregate teacher data and our modelling could have provided a more accurate view of the variation in the teacher data.

To account for the Wellbeing@School data not being purposively collected research data, we took an exploratory approach to our research. In light of this approach, our choice to use a series of models to describe each of *student wellbeing* and *student aggressive behaviours* separately seemed reasonable. However, this methodological choice didn't allow us to understand the relationship *between* these two measures accurately. One next step could be to explicitly model the relationship between these two measures (while accounting for their associations with teacher measures and demographic factors).

Despite the limitations of the Wellbeing@School data, it could still contribute to a larger research objective. Research tells us that it can take at least 2–5 years for changes in school culture to show in student data (Russell, 2003; Timperley, Wilson, Barrar & Fung, 2007). The Wellbeing@School data set contains data from 2012–2017. Therefore potentially the data set could be used to explore whether the schools that have repeated usage of the survey tools are making a difference to the two student outcome measures. This study could be supplemented by other data, for example, qualitative case studies. These case studies could explore the processes and actions that the school community consider have contributed to the changes observed in student and teacher data.

Our findings about Māori students are important to consider. In particular, we found that after accounting for student and school characteristics, Māori students had the lowest average level of wellbeing (Table 11). This finding is aligned with other health and wellbeing research (Crengle et al., 2013). The survey based approach that generated the data in this report is designed to capture indicative information from a broad range of students. To better understand our finding about the wellbeing of Māori students further research is necessary, including research from a Māori world view. One possibility is to learn from schools where good practice and good outcomes are occurring.

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