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ARTICLE

School climate, school identification and student outcomes: A longitudinal investigation of student well-being

Kathleen A. Klik[1] | **Diana Cárdenas**[2,3] | **Katherine J. Reynolds**[2,4]

[1]University South Carolina Union, Union, South Carolina, USA

[2]Research School of Psychology, Australian National University, Canberra, Australian Capital Territory, Australia

[3]Department of Psychology, University of Montreal, Montreal, Quebec, Canada

[4]Melbourne Graduate School of Education, University of Melbourne, Melbourne, Victoria, Australia

Correspondence

Katherine J. Reynolds, Research School of Psychology, Australian National University, Canberra, ACT, Australia & Melbourne Graduate School of Education, University of Melbourne, Melbourne, Vic., Australia.
Email: katherine.reynolds@anu.edu.au

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Abstract

Background: Schools are increasingly recognized as key facilitators of child and youth well-being. Much attention has been directed to the school social environment and the areas of school climate or school connectedness/identification. Drawing on the social identity approach and related work, it has been argued that school social identification may be the mechanism or process through which school climate comes to impact individual student functioning (*Applied Psychology*, 28, 2009, 171). Much of the previous research on social identity and well-being, though, is limited because it is cross-sectional.

Aims, Sample & Methods: This current study aims to advance understanding of the relationships between school climate, school identification and positive and negative well-being. It adopts a three-wave longitudinal sample of Australian students ($N = 6537$ wave 3, grades 7–10) and incorporates a range of control variables. Multilevel modelling (MLM) is used to test relationships of interest.

Results and Conclusions: In line with predictions, school identification was a significant mediator of the relationship between school climate and the well-being dimensions of positive affect and depression (but not anxiety). The substantial theoretical and practical implications of this research are discussed, including the role of the school social environment in helping young people successfully transition to adulthood.

KEYWORDS

anxiety, depression, mental health, positive affect, school belonging, school climate, school connectedness, social identity, well-being

BACKGROUND

Subjective well-being—people's positive evaluation of their lives, including positive emotion, satisfaction and meaning and the absence of negative conditions—underpins a strong and sustainable society (Diener & Seligman, 2004). The school social environment, especially during early adolescence (grades 7–10), is increasingly recognized as an important context that can strengthen well-being and support successful transitions to adulthood. School factors also can buffer, or compensate for, negative life events (disadvantage, trauma; Anderson, 1982; Centers for Disease Control and Prevention, 2009). Recent evidence indicates well-being also impacts academic achievement which underpins future prosperity (Cárdenas et al., 2022). Thus, a better understanding of how school factors strengthen well-being is an important first step in supporting healthier individuals and communities.

Two widely researched aspects of the school social environment related to well-being are school climate and school connectedness or identification (Blum & Libbey, 2004; Lee et al., 2017; Wingspread Declaration on School Connections, 2004). To date, though, these two constructs have been investigated in largely cross-sectional and separate and distinct bodies of work. This fracturing of the evidence makes it difficult to fully assess the importance of the school social environment for student well-being outcomes (Thapa et al., 2013).

To address these issues, this current research further explores an integrated framework of school climate and school connectedness based on social identity theory (Tajfel & Turner, 1979) and self-categorization theory (Turner et al., 1987; Turner & Reynolds, 2012), which engages with group psychology and group processes. When applied to the school context, this framework highlights that students' psychological self-definition as a school (group) member—their school (social) identification—is critical. Importantly, the current research examines the longitudinal relationship between school climate and school (social) identification in explaining positive and negative well-being (i.e. positive affect, depression and anxiety). Longitudinal research not only makes it possible to take into account an array of background characteristics or control variables that may confound the relationships of interest. It increases confidence in the likelihood of causal mechanisms and processes (although causality cannot be determined). Insights regarding these processes can be used to develop more effective and efficient interventions and prioritize practices within schools. Relevant research that underpins these arguments is reviewed prior to the research being outlined in detail.

School climate, school connectedness and school outcomes

School climate

The school climate construct is complex and multi-dimensional. It has been described as the unwritten atmosphere of a school, including its norms, values and expectations (Brookover et al., 1978; Haynes et al., 1997). Further, it is referred to as capturing the 'heart and soul of a school' (Freiberg & Stein, 1999, p. 11), and the 'quality and character of school life' (Cohen et al., 2009, p. 182). Halpin and Croft (1963) provided a helpful analogy, that 'personality is to the individual what climate is to the organisation' (p. 1), as schools have their own unique characteristics (Moos, 1974). Importantly, school climate embodies the school's spirit or character, not its administrative or physical attributes (e.g. teachers' salary or classrooms).

More formally, school climate is widely defined as the psychosocial characteristics of a school which comprises three components or sub-factors (Moos, 1974; Thapa et al., 2013). These components are (1) the school's academic emphasis; 'the extent to which a school is driven by a quest for academic excellence' (Hoy et al., 1991, p. 71); (2) interpersonal relationships within a school, between students and between staff and students which are judged by their quality and consistency (Haynes et al., 1997) and (3) shared norms, goals and values; the common understanding of accepted and endorsed behaviour (Frederickson, 1968). There is increasing consensus that these sub-factors are central to the construct

and can be assessed as a unified factor (Lee et al., 2017). As is noted below, work to date either considers certain sub-factors singularly or the construct as a whole.

School climate and student outcomes

Across a number of education jurisdictions and countries, it has been demonstrated that positive school climate predicts adolescent psychological adjustment. However, only a handful of studies have investigated these relationships across multiple time points with even fewer examining more than two waves of data collection. Of the existing longitudinal research, there is evidence that school climate predicts important outcomes, including greater self-efficacy and grit as well as less stress and hopelessness (Wong et al., 2021), less anxiety (Kuperminc et al., 2001) and less depression (Brand et al., 2003; Brière et al., 2013; Kuperminc et al., 2001; Nie et al., 2020; Pössel et al., 2016; Way et al., 2007) in samples from Australia, Canada, China, Colombia and the USA. An additional issue is that often there is not a comprehensive assessment of school climate with it being variably assessed as a teacher-rated construct (Pössel et al., 2016), as an authoritative climate (Wong et al., 2021), or only as teacher support which is an aspect of the student-teacher relationship (Joyce & Early, 2014; Way et al., 2007). There is scope for additional longitudinal research incorporating better measurement of both school climate and adolescent well-being (László et al., 2019).

School connectedness

There is a largely distinct body of work concerning school connectedness or belonging which has been shown to affect adolescent well-being and health (Centers of Disease Control and Prevention, 2009; Resnick et al., 1997). The importance of connection to, and being accepted within, a larger cohesive entity, such as the school as a community, is recognized as being important in an educational context (Finn, 1989; Finn & Zimmer, 2012; Goodenow, 1992; Solomon et al., 2000). For example, Osterman (2000) discussed the importance of feeling part of the group—that the group is important to you and you are important to the group—in explaining achievement. Finn's (1989) participation-identification model recognizes that belonging and attachment to the school leads to commitment to the school's goals and engagement in school-relevant tasks (Goodenow, 1993). Similarly, the social development model (Catalano & Hawkins, 1996) argues that a particular socializing unit such as a school can encourage certain behaviours (and inhibit others) as a result of bonding that occurs with the unit. Under these conditions, there is conformity to the values, beliefs and norms that define the entity.

School connectedness (identification, belonging) and student outcomes

Longitudinal research has demonstrated the relationship between school connectedness and well-being. Along these lines, Bond et al. (2007) included measures of both peer connections and school connectedness in longitudinal surveys completed in year 8, year 10 and 1 year post-secondary study. Results indicated that high levels of peer and school connectedness were related to less depression/anxiety over time. There is also evidence of similar relationships over a longer period, from the age of 16 to middle age (Langille et al., 2012). In this study, low school connectedness predicted depressive symptoms up to 35 years later, though explaining the mechanism of this long-term influence requires more life course studies.

Summary

On balance, there is a body of longitudinal research that indicates school climate or school connectedness are significantly related to adolescent well-being outcomes. However, these are largely separate

lines of enquiry. The lack of integration between the research on school climate and school connectedness has created a gap, such that the total impact of the school environment (i.e. school climate and school connectedness) on well-being remains difficult to detect. The way school climate and well-being are assessed are also variable. The current research offers an integration and more comprehensive assessment of the relationship between the school social environment and well-being outcomes. As a result, there is potential to focus attention on these factors in addressing mental health and well-being declines and relatedly, learning outcomes.

Integrating school climate and school connectedness through social identity

An emerging body of research that can better connect school climate (the social or group environment) and school connectedness (belonging, identification) builds on the social identity perspective which is focused on the group and group psychology. Within social identity and self-categorization theories (Tajfel & Turner, 1979; Turner et al., 1987; Turner & Reynolds, 2012), it is recognized that people have both personal ('I' and 'me') and social ('we' and 'us') identities. Social identity captures the degree to which group membership is self-relevant and important. When this is the case, being a group member can provide a sense of purpose and meaning, motivate behaviours that reflect well on the group, enable people to ask for, give and receive social support and engender a sense of belonging (Haslam et al., 2009, 2018; Jetten et al., 2012; Sani et al., 2015).

There are two fundamental aspects of group life: the characteristics of the group (norms, values, practices) to which one considers themselves a member (e.g. nation, neighbourhood, school, work team) and the extent to which the group is important to individuals. It has been argued that, within schools, school climate and school identification reflect each of these characteristics, respectively (Bizumic et al., 2009; Lee et al., 2017; Maxwell et al., 2017). Group psychology depends on norms, values, beliefs and behaviours being established, communicated and reinforced. It is necessary to define and consensualise who we are, what we do and why we do it (Reynolds et al., 2020). In a way, a positive school climate assesses the success or otherwise of these kinds of activities. In contrast, school identification concerns the degree to which the group is psychologically meaningful and self-defining.

Interrelationship between school climate and school identification

These aspects of group life are intertwined where typically positive experiences, such as being included, respected and treated well, are likely to increase identification with the group (Turner & Reynolds, 2012; Tyler & Blader, 2000). The more the group characteristics are inclusive and represent its membership the more likely social identification will emerge (Steffens et al., 2014). There are processes that can be implemented to maximize the degree to which the school group becomes psychologically significant. Turner and Reynolds (2012) outline one approach where staff, students and interested parents and community members (as sub-groups) discuss and agree on the vision, purpose and ideal behaviours for staff and students within a particular school (Haslam et al., 2003; Turner et al., 2014). Through a process where sub-group representatives work together, themes are identified which serve to define and clarify the norms, values and beliefs that define the school. These underpin leadership and school activities and communications serving to build an inclusive sense of who we are, but in a way that harnesses diversity and difference to build unity.

There are complexities in such processes and there is a risk that certain views about who we are will be neglected or marginalized. There needs to be a culturally responsive mindset throughout where students with diverse linguistic, cultural, religious and socio-economic backgrounds are engaged (Naylor et al., 2023). These same issues apply to other school-based initiatives such as School-Wide Positive Behavioural Support and Intervention, where definitions of appropriate behaviours may not be culturally responsive. Strategies that empower the voices of students, family and community lead-

ers will be more successful not least because such engagement ensures inclusivity and an equitable school climate which in turn builds legitimacy and identification (Turner & Reynolds, 2012; Tyler & Blader, 2000).

Social identity and well-being

Importantly, social identification predicts better mental health and well-being outcomes with a small but growing body of longitudinal work exploring healthy populations, where identification and well-being are assessed at multiple time points. Along these lines, Fong et al. (2021) examined the impact of an intervention to strengthen connections within the neighbourhood, finding that changes in neighbourhood identification across time were associated with a reduction in loneliness at Wave 2, and greater general well-being at Time 3. With respect to healthy adolescents, Miller et al. (2018) surveyed approximately 400 adolescents aged 13–17 years on two occasions 11 months apart. They assessed social identification with peers, family and school groups and youth mental well-being using the General Health Questionnaire. School identification at Wave 1 significantly predicted mental health at Wave 2. No significant findings were observed for peer and family identification.

Considering the school environment specifically, Bizumic et al. (2009) investigated the relationship between both school climate and school identification and student well-being. They found that a more positive school climate or group atmosphere was related to higher school identification which in turn predicted student well-being. More specifically, school identification significantly mediated the effect of a positive school climate on adolescent self-esteem, positive affect, anxiety, depression and loss of emotional control. Willis et al. (2019) investigated these relationships longitudinally for school staff. Social identification fully mediated the relationship between school climate and self-esteem longitudinally but showed no significant relationship with stress. Such patterns of results illustrate that an integration of school climate and school identification could provide a better understanding of well-being outcomes and deserves closer attention. However, what is missing is a longitudinal investigation of the school environment, both school climate and school identification, in predicting adolescent well-being.

Current research

The aim of the current research addresses this important gap. Using three annual waves of data collection of a sector-wide student survey, it was hypothesised that there would be a significant relationship across time between school climate and well-being (Hypothesis 1); between school climate and school identification (Hypothesis 2); between school identification and well-being controlling for school climate (Hypothesis 3) and finally, that student school identification would mediate the relationship between school climate and well-being (Hypothesis 4). Such evidence would further direct attention to the school environment in the prevention and buffering of youth mental ill-health. Well-being is assessed across both positive and negative domains (anxiety, depression and positive affect).

METHOD

Procedure and data

Data for this research was collected as part of an ongoing longitudinal project between a university department and an Australian Education directorate. Ethics approval was sought to access and analyse de-identified secondary data as part of this collaboration. To test the effect of school climate and school identification on student outcomes, survey responses of students from years 7 to 10 across 3 years (2015–2017) were merged.

Participants

Surveys were returned by 14,608 students across three waves (i.e. 2015, 2016 and 2017; across >25 schools). Where possible student surveys were linked across waves and to administrative data on parental education. Given that parental education does not typically change across waves, we made a combined variable that utilized data across all the waves, reducing the amount of missingness from the administrative data. Of those, 32.5% of students were not able to be matched to administrative data due to difficulty in linking or no response reported from the caregiver. Participants who did not have administrative data for parental education were removed from the sample prior to imputation.[1]

Surveys were retained for 6246 students in 2015 (response rate = 59.02%; full response = 52.12%). In 2016, surveys were returned by 4706 students (response rate = 46.35%; full response = 45.35%). In 2017, surveys were returned by 6537 students (response rate = 46.78%; full response = 41.8%). Students present during scheduled class times (during the third term of each school year) and who consented to participate answered the survey. The response rates represent student absences on survey days and difficulties in matching participants across waves and/or to the administrative data. Across all waves, participants report being approximately 14 years of age. The majority of the sample reported that the parent with the highest qualification did not have a university education (55.4%). The sample was made up of 45.7% males and 46.9% females. A portion of students did not answer information about gender (7.4%).

Student measures

School identification and components of school climate

As has been previously described, school climate is a complex and multi-dimensional construct that is best captured by assessing its multiple dimensions and combining them to assess the overall school climate. The School Climate and School Identification Measurement Scale-Student (SCASIM-St; Lee et al., 2017) was designed to assess school climate, by assessing four of its subdimensions (as well as school identification). Given the strengths of the measurement tool, a composite measure is used.

In line with the definitions outlined above, Wave 1 (2015) school climate includes four subscales (where relationships are divided further to form two factors): academic emphasis (8 items: $a = .94$), student–student relations (7 items: $a = .96$) and staff–student relations (9 items: $a = .97$) and shared values and approach (8 items: $a = .93$). The subscales of school climate were averaged together to form one measure of school climate ($a = .91$), where higher scores indicate a more positive school climate.

School identification W2 was measured with the six items of the SCASIM-St (Lee et al., 2017) that assess a student's psychological connection to the school group ($a = .95$). Items were averaged such that higher scores indicate stronger school identification.

Students rated their agreement on the school climate and school identification items on a Likert scale that ranged from 1 (strongly disagree) to 5 (agree strongly). The SCASIM-St has demonstrated both content reliability and test–retest reliability (Lee et al., 2017) with similar results in international samples (Demirtas-Zorbaz & Hoard, 2019; Gálvez-Nieto et al., 2021).

Positive affect

Ten items from the personal well-being subscale of the Australian Adolescent version (Heubeck & Neill, 2000) of the Mental Health Inventory (MHI; Veit & Ware, 1983) were used to measure psychological well-being or general positive affect. Students rated the items on a 7-point Likert scale that ranged

[1]Given Parental Education was likely Missing Not at Random (MNAR) which prevents the use of multiple imputations, we opted to not employ the data from those who had missing responses on this variable.

from 0 (None of the time) to 2 (All the time). The MHI has demonstrated good internal consistency (Heubeck & Neill, 2000), content validity (Cassileth et al., 1984; Ware et al., 1979) and test–retest reliability (Heubeck & Neill, 2000; Veit & Ware, 1983). Items were averaged such that higher scores indicated more positive affect ($a = .94$).

Generalized anxiety

Nine items based on the Screen for Child Anxiety-Related Emotional Disorders measure (SCARED; Birmaher et al., 1997) were used to measure generalized anxiety. Minor adjustments were made to wording prior to using this scale in the current research. Developed to screen children with anxiety, the SCARED measure has demonstrated good internal consistency, discriminant validity and test–rest reliability (Birmaher et al., 1997). Items include statements such as 'People tell me I worry too much' and 'I worry about people liking me' (Birmaher et al., 1997). Students rated items on a 3-point Likert scale that ranged from 0 (Not true or hardly true) to 2 (True or often true). The generalized anxiety scale demonstrated good internal consistency ($a = .91$). The items were averaged such that higher scores indicated more anxiety.

Depression

A 10-item short version of the Centre for Epidemiological Depression Scale (CES-D) was used to measure depression (Boston short form; Kohout et al., 1993). The CES-D was developed to measure current symptoms of depression and has demonstrated internal reliability and content validity when used in adolescent populations (Chabrol et al., 2002; Cuijpers et al., 2008). The CES-D, Boston short form has concrete items (i.e. 'My sleep was restless' and 'I felt that people disliked me'), making it well suited for adolescents. Students rated the items on a 4-point Likert scale that ranged from 0 (Rarely/none) to 4 (Very often/always). These items demonstrated good internal consistency ($a = .84$). Items were averaged together such that higher scores suggest that a student is experiencing a greater level of depressive symptomology.

Analysis plan

To test the hypothesis that school climate predicts greater school identification and in turn greater well-being, we employed multilevel modelling (MLM) to test the nested nature of the data (see Figure 1 for hypothesized model). Specifically, while individual students provided responses to the survey, students are nested within their schools, which means that students from the same school may have shared variance. To account for this shared variance in the outcome variable, we examined the variance at two levels: the individual (within) and the school (between) levels. This was examined with 'null models' (Model 0) that were run to obtain the ICCs (intra-class correlations; Goldstein et al., 2002) and the design effects (Muthen & Satorra, 1995). The ICCs estimate the variance at the between level (Goldstein et al., 2002) and thus determine the extent to which the responses within schools were independent of each other (Hox, 2010).

MLM path analyses were then tested using a series of hierarchically built models, with a new set of variables included in each Model. Model 1 included the effect of covariates (parental education, age and the dependent variable at Wave 1) on the dependent variables. Model 2 added the direct relationship between school climate at Wave 1 and the dependent variable at Wave 3. Model 3 assessed the impact of school identification at Wave 2 on the dependent variable at Wave 3. Model 4 assessed the direct relationship between school climate at Wave 1 and school identification at Wave 2. Lastly, Model 5 explored the indirect effects of school climate at Wave 1 on the dependent variable at Wave 3 through school identification at Wave 2. Thus, this last model tested the full mediation model.

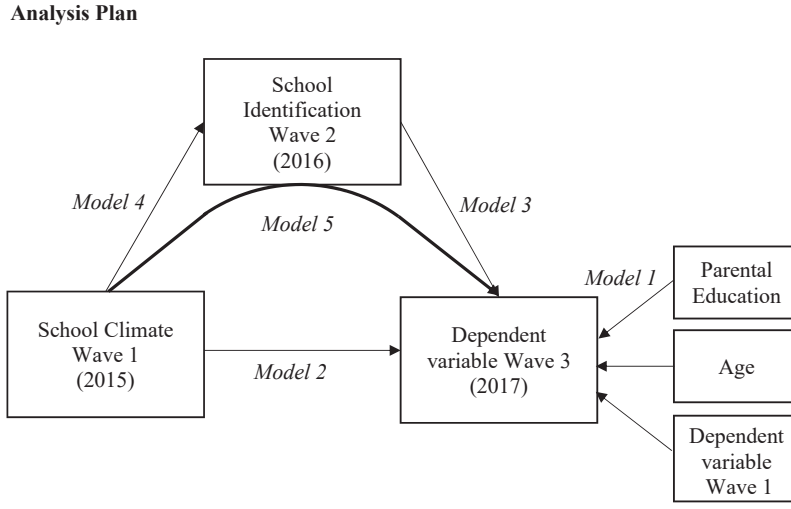

FIGURE 1 Illustration of the tested hierarchically built models.

RESULTS

Preliminary analyses

Data cleaning, missing data analysis and descriptive statistics were completed using SPSS Version 26 while Mplus 8.3 was used to conduct multilevel multiple imputation (MI) and multilevel path analyses. In longitudinal research in schools, missing data are inevitable, as students may be absent during a data collection day, mistype their participant code, fail to include their participant code, or simply not choose to participate in later years. Despite efforts to retain participants across each wave of data collection, there was still a significant amount of missing data. For the demographic covariates of age, the missing rate was 35.7%. Little's MCAR test was significant ($p < .01$) which suggests that the data were not missing completely at random (MCAR). Further exploration of the pattern of missing data suggests that missingness was related to other variables in the data set (i.e. missing at random, MAR; Newman, 2014; Tabachnick & Fidell, 2013). To retain as many cases as possible and obtain a less biased and more powerful estimation of coefficients (Newman, 2003), multiple imputation (MI) with Mplus was used to impute missing values for the following variables in the three waves of data collection: school climate, student identification, positive affect, depression and anxiety and age. Given the percentage of missing, 40 imputations were used as recommended (Graham et al., 2017).

Data screening revealed that the data were not normally distributed. Non-normality was dealt with in Mplus using the MLR estimator which is robust to non-normality (Muthén & Muthén, 1998–2012). The data sets were merged and then combined. Means, standard deviations and student sample size for all three waves are presented in Table 1.

Main analyses

For all outcome variables, Model 0 estimated that the ICC ranged from .02 to .13 and design effects were above two for all variables (ranging from 4.50 to 9.75; Muthen & Satorra, 1995), indicating that the responses within schools were not independent. Given the nested nature of the data, multilevel models (MLM) were necessary for all subsequent analyses to account for the variance at the school level, even though all variables were assessed at the within level (or 'individual level') of the model.

Three sets of MLM path analyses (one per dependent variable) were employed to test the hypothesized model (Figure 1), and each path analysis was hierarchically built. In the main, the results of these

TABLE 1 Descriptive statistics before imputation.

	Wave 1 (2015)			Wave 2 (2016)			Wave 3 (2017)		
Variable	***M***	***SD***	***n***	***M***	***SD***	***n***	***M***	***SD***	***n***
Age	13.84	1.20	5296	13.92	1.26	4656	13.94	1.24	5498
School identification	4.58	1.42	3215	4.61	1.44	3674	4.67	1.26	5891
School climate	4.46	1.22	3197	4.57	1.20	3673	4.58	1.04	5867
Positive affect	2.11	.57	3144	2.09	.58	3662	2.04	.60	5759
Depression	1.84	.75	3123	1.85	.78	3659	1.13	.65	5592
Anxiety	1.72	.71	3131	1.74	.72	3661	.98	.60	5731

longitudinal analyses on student well-being confirmed our expectations. Overall, for positive affect and depression (but not anxiety) we found a significant indirect effect of school climate via school identification, such that the effect of school climate at Wave 1 on student and staff outcomes at Wave 3 can be explained by a stronger identification with schools at Wave 2. The results are outlined in more detail below.[2]

Positive affect

The demographic covariate-only model (Model 1) showed that 18.0% of the variance in positive affect at Wave 3 was explained by age, parental education, and positive affect at Wave 1 (see Table 2), with age and positive affect at Wave 1 significantly predicting positive affect at Wave 3. Model 2 tested the direct relationship between school climate at Wave 1 and positive affect at Wave 3, and this relationship was not significant. In Model 3, we tested the direct relationship between school identification at Wave 2 and positive affect at Wave 3. This relationship was significant, such that higher levels of school identification at Wave 2 were associated with more positive affect at Wave 3. The addition of school identification assessed approximately 12 months prior explained another 5% in the variance of positive affect.

In Model 4, we assessed the direct relationship between school climate at Wave 1 and school identification at Wave 2, which was positive and significant. In Model 5, we tested the indirect effects of school climate at Wave 1 on positive affect at Wave 3 through school identification at Wave 2. The indirect effect was significant, such that a more positive perception of school climate at Wave 1 was associated with higher levels of school identification at Wave 2, which in turn was associated with higher levels of positive affect at Wave 3 while accounting for parental education, age, and positive affect at Wave 1. The final model indicates that all variables together explain 21.0% of the variance in positive affect at Wave 3.

Depression

A total of 17.7% of variance in depression at Wave 3 was explained by the three covariates of age, parental education, and depression at Wave 1 (see Model 1 in Table 3), all of which were significantly associated with depression at Wave 3. Model 2 indicated that the association between school climate at Wave 1 and depression at Wave 3 was significant. In Model 3, we tested and found that higher levels of school identification at Wave 2 were associated with less depressive symptomology reported at Wave 3. The addition

[2]To test the robustness of our findings with a different method for managing missing data, we ran Model 5 employing Full Information Maximum Likelihood to keep all the participants, even those who had parental education missing (Total $N = 11{,}745$) and the pattern of results was identical; school climate at Wave 1 was associated with greater school identification at Wave 2, which in turn was associated with greater positive affect and lower depression (but not anxiety) at Wave 3. The indirect effects of school climate on positive affect and depression via school identification remained significant.

TABLE 2 Positive affect.

		Model 1[b]		Model 2[b]		Model 3[b]		Model 4[b]		Model 5	
	Model 0	*b*	*SE B*	*b*	*SE B*	*b*	*SE B*	*b*	*SE B*	*b*	*SE B*
Level 1 predictors											
Parental education[a]	–	−.03	.03	−.03	.03	−.03	.03	−.03	.03	−.03	.05
Age	–	−.07**	.02	−.07*	.02	−.03	.02	−.03	.02	−.03	.01
Positive affect at Wave 1	–	41**	.02	.39**	.03	.34**	.03	.35**	.03	.35**	.03
School climate	–	–	–	.03	.02	−.06	.04	−.06	.04	−.06	.04
School identification	–	–	–	–	–	.25**	.03	.26**	.03	.26	.03
School climate to school identification (direct)								.51**	.02	.51**	.03
School climate to positive affect (indirect)								–	–	.13**	.02
Model statistics											
Within-school variance	.35**	.29**		.29**				.28**			
Between-school variance	.00*	.00		.00				.00			
Chi square (*df*)	–	–		–				287.50 (3)			
CFI	–	–		–				.95			
SRMR	–	–		–				.06			
Within-school *R* square	–	.175**		.176**				.220**			

Note: *$p < .05$; **$p < .01$ (two tailed-tests).

Abbreviations: *b*, standardized beta coefficient; CFI, Comparative Fit Index; *SE B*, standard error for the unstandardized beta; SRMR, Standardized Root Mean Square Residual.

[a]Parental Education, 1 = university degree or higher, 0 = lower than university degree.

[b]Model 1–Model 4 were regression models not involving model fit statistics.

of school identification assessed approximately 12 months prior explained another 1% in the variance of depression.

Model 4 showed that there was a direct relationship between school climate at Wave 1 and school identification at Wave 2, whereas Model 5 tested the indirect effects of school climate at Wave 1 on depression at Wave 3 through school identification at Wave 2 (see Table 3). This indirect effect was significant; a more positive perception of school climate at Wave 1 was associated with higher levels of school identification at Wave 2, which in turn was associated with a reduction of depressive symptomology at Wave 3, while accounting for parental education, age and depression at Wave 1. Together, these variables explain 18.3% of the variance in depression at Wave 3.

Anxiety

Model 1 showed that parental education and anxiety at Wave 1 significantly impacted anxiety at Wave 3 (with 19.7% of variance explained by all covariates; see Table 4). The results of Model 2 indicate that the direct relationship between school climate at Wave 1 and anxiety at Wave 3 was not significant. In Model 3, we tested and found a marginally significant direct relationship between school identification at Wave 2 and anxiety at Wave 3.

The results of Model 4 indicated that more positive perceptions of school climate at Wave 1 were associated with more school identification at Wave 2. Lastly, Model 5 indicated that there was a non-significant indirect effect ($p < .05$), such that a more positive perception of school climate at Wave 1 was associated with marginal higher levels of school identification at Wave 2, which in turn was associated with a marginal reduction in anxiety at Wave 3 while accounting for parental education, age and anxiety at

TABLE 3 Depression.

		Model 1[b]		Model 2[b]		Model 3[b]		Model 4[b]		Model 5	
	Model 0	*b*	*SE B*	*b*	*SE B*	*b*	*SE B*	*b*	*SE B*	*b*	*SE B*
Level 1 predictors											
Parental education[a]	–	.39**	.03	.39**	.03	.38**	.03	.38**	.03	.38**	.03
Age	–	.03*	.02	.03	.01	.02	.02	.02	.02	.02	.02
Depression at Wave 1	–	.17**	.03	.15**	.03	.14**	.03	.14**	.03	.14**	.03
School climate	–	–	–	−.05*	.02	−.01	.03	−.01	.03	−.01	.03
School identification	–	–	–	–	–	−.09**	.03	−.09**	.03	−.09**	.03
School climate to school identification (direct)								.51**	.02	.51**	.02
School climate to depression (indirect)								–	–	−.03**	.01
Model statistics											
Within-school variance	.48**	.40**		.40**				.40**			
Between-school variance	.00	.00		.00				.00			
Chi square (*df*)	–	–		–				265.63 (3)			
CFI	–	–		–				.95			
SRMR	–	–		–				.05			
Within-school *R* square	–	.174**		.176**				.183**			

Note: †$p < .10$; *$p < .05$; **$p < .01$ (two tailed-tests).

Abbreviations: *b*, standardized beta coefficient; CFI, Comparative Fit Index; *SE B*, standard error for the unstandardized beta; SRMR, Standardized Root Mean Square Residual.

[a]Parental Education, 1 = university degree or higher, 0 = lower than university degree.

[b]Model 1–Model 4 were regression models not involving model fit statistics.

Wave 1 (see Table 4). When all variables are included in the final model, they explain 20% of the variance in anxiety at Wave 3.

DISCUSSION

The current study sought to further understand the relationships between school climate, school identification and adolescent positive affect, depression and anxiety. The research is novel and significant as it uses longitudinal models, examines psychological processes or mechanisms to explain change in student outcomes and incorporates multiple well-being dimensions and control variables. Across three annual waves of data collection, the key findings were as follows: (1) Wave 1 school climate was significantly related to Wave 3 depression but not anxiety and positive affect (partial support for H1); (2) Wave 1 school climate was significantly related to Wave 2 school identification (support for H2); (3) Wave 2 school identification was significantly related to Wave 3 depression and Wave 3 positive affect, but not anxiety (with Wave 1 school climate also in the model; partial support for H3) and (4) social identification mediated the impact of school climate on well-being but the relationship was weaker for anxiety (support for H4). This research is the most comprehensive of its kind and clearly indicates the school social environment is related to well-being outcomes and as such can be a force to change lives for the better. Each of these findings will be examined in more detail.

TABLE 4 Anxiety.

		Model 1[b]		Model 2[b]		Model 3[b]		Model 4[b]		Model 5	
	Model 0	*b*	*SE B*	*b*	*SE B*	*b*	*SE B*	*b*	*SE B*	*b*	*SE B*
Level 1 predictors											
Parental education[a]	–	.17**	.04	.17**	.04	.17**	.04	.17**	.04	.17**	.04
Age	–	.01	.02	.00	.02	−.01	.02	−.00	.02	−.01	.02
Depression at Wave 1	–	.40**	.02	.40**	.02	.40**	.02	.40**	.02	.40**	.02
School climate	–	–	–	−.02	.02	.01	.03	.01	.03	.01	.03
School identification	–	–	–	–	–	−.05†	.03	−.05†	.03	−.06†	.03
School climate to school identification (direct)								.51**	.02	.51**	.02
School climate to anxiety (indirect)								–	–	−.03*	.01
Model statistics											
Within-school variance	.36**	.29**		.29**				.29**			
Between-school variance	.00	.00		.00				.00			
Chi square (*df*)	–	–		–				209.47 (3)			
CFI	–	–		–				.96			
SRMR	–	–		–				.05			
Within-school *R* square	–	.195**		.197**				.197**			

Note: †$p < .10$; *$p < .05$; **$p < .01$ (two tailed-tests).

Abbreviations: *b*, standardized beta coefficient; CFI, Comparative Fit Index; *SE B*, standard error for the unstandardized beta; SRMR, Standardized Root Mean Square Residual.

[a]Parental Education, 1 = university degree or higher, 0 = lower than university degree.

[b]Model 1–Model 4 were regression models not involving model fit statistics.

School climate and well-being (H1)

With respect to the relationship between school climate and well-being (H1) across the three waves, the results were partly consistent with extant research. Three well-being domains were examined but results were in the expected direction only for depression. This is an important finding. It indicates that when students experience a school with shared values, caring relationships and academic emphasis, there is less depression experienced by those same students 2 years later. These results are in line with a number of previous longitudinal investigations of this same relationship. For example, Pössel et al. (2016) confirmed a longitudinal relationship using teacher ratings of school climate and student ratings of depressive symptoms. This research highlights the need to better understand the mechanisms at work, an issue addressed in this current research.

Surprisingly, these same patterns of results regarding school climate were not observed for the well-being dimensions of anxiety or positive affect (counter to H1). Therefore, the current results are inconsistent with Kuperminc et al. (2001) who reported a significant relationship between school climate and internalizing problems that incorporates anxiety and depression using a two-wave (1-year apart) design. A difference in the current study, though, is that distinct measures were utilized to assess depression and anxiety. This suggests that the way anxiety is assessed could help explain these current results. Similarly, it seems school climate may not be straightforwardly related to positive affect across time.

School identification as a predictor (H2 and H3)

With respect to school identification, there is evidence of a significant relationship with school climate (in support of H2) and across time with depression and positive affect, but not anxiety when controlling for school climate (partial support for H3; Bizumic et al., 2009; Miller et al., 2015, 2018). These findings add

to a growing body of work on the importance of the school environment for adolescent mental health. They also serve to further bolster the growing body of work on social identity processes and mental health because unlike much of the previous work, the current sample comprises healthy adolescents and the models are longitudinal incorporating a number of control variables (Haslam et al., 2018; Jetten et al., 2012). It can be concluded that stronger identification with the school as a group is significantly related to better well-being but may not be related to reduced student anxiety. With respect to anxiety specifically, again the current research incorporated discrete measures of anxiety (and particularly worry) rather than a measure also assessing depression (Bond et al., 2007).

School identification as a mediator (H4)

Importantly and in line with predictions, there was also evidence that social identity processes mediated the impact of school climate on well-being (support for H4). It was expected that school identification would be a significant mediator of the relationship between school climate and student well-being outcomes. In this way, this current research offers insights into a mechanism through which school climate impacts student outcomes, an area where there have been repeated calls for more development and research (Langille et al., 2012; Pössel et al., 2016). Furthermore, such results are in line with previous theoretical arguments surrounding belonging and school connectedness (Goodenow, 1992; Osterman, 2000) and school identification processes (Bizumic et al., 2009; Reynolds et al., 2017; Turner et al., 2014) but these relationships have now been investigated across time in three waves (see also Roeser et al., 1996). By transforming a school's climate to be more positive, school identification is strengthened and well-being can be positively impacted.

Complexities with key relationships

It is useful to further clarify the complexities of school climate and school identification and links to well-being. There are two main issues. The first is the definition and emergence of a school group that is representative of its members such that the norms, values and beliefs are not imposed but represent the diversity and differences as well as similarities of members. It is not possible to psychologically identify with a group that is 'imposed'. To foster psychological connection, the group needs to represent 'us'. It is necessary for leadership and school members to navigate the cultural heterogeneity and the different strengths, interests and visions across the school in ways that are inclusive. It is necessary to manage the ongoing contest for influence in defining and shaping who 'we' are (Subašić et al., 2022).

The second issue is that not all groups are defined by norms and beliefs that promote well-being (e.g. smokers, drug abusers). It is necessary to advance research into how certain meanings attributed to schools (and other groups) emerge over others (see Reynolds et al., 2017; Turner & Reynolds, 2012). To affect school outcomes in a positive way, there needs to be a purposeful effort on the part of leadership and other school members to clarify and consensualise the defining features of the school (who we are, what we do and why we do it) in ways that are community-sensitive and inclusive and keep these qualities at the forefront of the school enterprise (e.g. learning, caring relationships; Naylor et al., 2023). There may also be broader societal norms and values that place boundaries on these processes and resistance from certain pockets within the school that will need to be planned for and managed. The point is that these challenges and opportunities will be better addressed through engagement with these insights from social identity and group psychology.

On a more practical note, these results suggest that efforts on the part of schools to build a representative school climate where students and staff alike feel valued, respected and included is time and energy well-spent. Under these conditions, school identification is likely to be stronger leading to clear well-being benefits for students. There are a number of activities and programs that have been developed that affect school climate and/or school identification. Classroom management and extra-curricular activities

(McNeely et al., 2002) can build school connection. Specific programs include the Comer School Development Program (Comer et al., 1996), School-wide Positive Behavioural Support (Barker et al., 2023; Cardenas, Reynolds, & Lee, 2023) and effective social identity leadership (Cardenas, Reynolds, & Reid, 2023).

Limitations and future directions

This program of research highlights the importance of school climate and identification processes in explaining adolescent student well-being. Having said this, though, there are areas to consider in designing future research.

Missing data

Longitudinal data are often associated with missing responses, participant attrition and challenges with matching responses. These issues are also evident in the current research which means responses should be interpreted with some caution. For example, a student at school on three random days across 3 years is likely to identify more with the school and fill in requested material more diligently. Also given missing data with respect to Parental Education (see Footnote 1), these results may be more prevalent amongst parents with higher educational qualifications. In future research, other methods could be considered to link students to administrative data for parental education to increase the representativeness of the sample population. A less conservative approach to multiple imputation methods to address missing data on parental education and gender could also be explored, but a clear rationale will be required. The additional analyses (Footnote 1) suggest a similar pattern of results with the larger sample.

Effect sizes

It is also the case that the key variables included in the current research are explaining approximately 20% of the variance in the well-being outcome of interest with social identity uniquely adding approximately 1%–5%. The practical implications of small effects such as this can be meaningful and important. Having acknowledged this, it is also important to note this is longitudinal research, which reveals patterns in relationships between key constructs across time over and above differences in the characteristics of participants. Within this large sample with its specific qualities, there is evidence to support key predictions, shedding light on drivers of youth well-being. There may be merit in a more careful exploration of the school climate sub-factors so as to assist in better-directing school leadership on the most important aspects (e.g. staff–student relationship, shared purpose and values) to focus their attention.

Control variables

A key control variable was age, given that from 10 to 18 years important changes have been observed in school climate (Grazia, 2022). The study could benefit from additional analyses that control for other potential confounds or mediators of the relationship between school climate, school identification and student outcomes. In particular, consideration should be given to the socio-economic standing of the school itself (Patalay et al., 2020) and school size with some evidence of better well-being outcomes in larger schools (Watt, 2003). Other work has examined gender and ethnic differences in both school climate perceptions and well-being outcomes that warrant further attention (Coelho et al., 2020; Patalay et al., 2020).

Unexpected results for anxiety

The findings did reveal an unexpected pattern for anxiety. A non-significant longitudinal relationship with school climate and school identification and a weak mediation model. An explanation may relate to the generalized anxiety subscale that was used. In future research, other forms of anxiety should also be assessed (e.g. social or separation anxiety). For example, there is some evidence social anxiety is highly relevant to the school environment (Ryan & Warner, 2012). The limits with the assessment of anxiety could go some way in accounting for the inconsistent findings but more research is needed. It is also possible that anxiety is associated with experiences that are less impacted by the school's social environment (Turner et al., 2014).

Variability in well-being

More broadly the current research raises questions about well-being and its inherent variability for this age group. There is an emerging consensus that subjective well-being is variable and typically decreases with age across adolescence. There are also debates about a set-point range within which well-being can fluctuate and how these are determined for each person and when such set-points emerge developmentally (Casas & González-Carrasco, 2019). This variability also has to be able to be detected by the measurement tools that are utilized. These are important directions for future research on the well-being construct more broadly.

Despite these limitations, the research signals some important directions to address student well-being. The findings suggest that activities at the school level that strengthen the positive characteristics of the school group and students' self-definition as school members could further strengthen mental health (Bizumic et al., 2009; Reynolds et al., 2015). School leadership and education policymakers who are dedicated to the issues of student well-being need to consider social identity processes in their planning and initiatives.

CONCLUSION

Key ideas from the social identity perspective were introduced and investigated longitudinally in order to advance understanding of youth well-being. The aim was to integrate work on the school social environment including the characteristics that describe the school (school climate) and students' school identification (attachment, connectedness and belonging). The impact of school climate on student well-being dimensions of depression and positive affect (and more weakly for anxiety) were found to be explained through school identification processes. School climate impacts student well-being outcomes when there is a sense of 'us' as a school group. Such findings provide a way forward to strengthening student well-being and building a brighter future for individuals and communities.

AUTHOR CONTRIBUTIONS

Katherine J. Reynolds: Conceptualization; funding acquisition; methodology; project administration; resources; writing – original draft; writing – review and editing. **Diana Cárdenas:** Conceptualization; formal analysis; methodology; software; validation; writing – original draft; writing – review and editing. **Kathleen A. Klik:** Conceptualization; formal analysis; methodology; writing – original draft; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

There are no conflicts of interest for authors.

DATA AVAILABILITY STATEMENT

The data that support the findings in this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ORCID

Katherine J. Reynolds https://orcid.org/0000-0002-2282-7290

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