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ARTICLE

The identification environment matters: Students' social identification, perceived physical school environment, and anxiety – A cross-level interaction model

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Abstract

The social identity approach to health argues that well-being depends on the psychosocial circumstances of the groups to which individuals belong. However, little is known about how the average level of identification in the group – 'the identification environment' – buffers the negative health consequences of stressors. We used multilevel modelling to investigate whether identification environment in a school modified the association between the students' perceptions of the quality of their school's physical environment and their reported levels of anxiety. In two representative samples of Finnish school students ($N = 678$ schools/71,392 students; $N = 704$ schools/85,989 students), weak identification environment was related to increased anxiety. In addition, in schools where identification environment was weaker, the student level relationship between perceived physical environment and anxiety was stronger, and students were more anxious. Our results provide evidence that identification environment needs to be considered when we analyse how group membership affects well-being.

KEYWORDS

anxiety, multilevel analyses, perceived physical environment, social identification, social identity approach to health

BACKGROUND

Although schoolchildren's anxiety symptoms were already relatively common before 2020 (Biswas et al., 2020; Polanczyk et al., 2015), significantly more schoolchildren presented symptoms during the COVID-19 pandemic. Accordingly, Racine et al.'s (2021) meta-analysis of 25 studies reported a pooled prevalence estimate of 21% elevated anxiety symptoms among adolescents and children. Clearly, anxiety in schools is an important focus of investigation in the post-COVID-19 era, raising questions about how the healing potential of groups can be harnessed to protect schoolchildren's mental health when they face stressors.

A growing body of literature demonstrates that the social environment can buffer the individual-level relationship between stressor and strain. For example, Torsheim and Wold (2001) showed that classmate support at the school level moderated the association between school stress and health complaints at the student level. Similarly, Alfes et al. (2018) showed that shared perception of team-level support buffered the effect of role overload on employees' subjective health ratings. Finally, Portoghese et al. (2017) found that a supportive co-worker climate moderated the relationship between employees' role clarity and exhaustion (see also Tucker et al., 2013). Overall, these studies demonstrate that a supportive social environment in the group can help individuals cope and promote well-being in the face of stressors.

The Social Identity Approach (SIA) to Health (Haslam et al., 2018, 2005, 2009) has foregrounded the connections between individual well-being and the circumstances of the groups to which individuals belong. However, most of this work treats social identification as an individual-level predictor of health outcomes. In contrast, we link social identification back to the circumstances of the group by focusing on the identification environment within the group and investigate the cross-level interaction between this group-level contextual factor and a stressor (perceived quality of the physical environment) on individual well-being. We study these issues in the school context.

Our study has two aims. First, we consider how a school's identification environment buffers the relationship between the degree to which a student perceives the school's physical environment as worse than other students do in the same school (the stressor) and their experience of anxiety (the strain). Second, we test two opposing hypotheses that reflect a debate in the group cohesion literature (Braaten, 1991; Hogg, 2001): whether group cohesiveness increases the perceived similarity and the need to conform to group norms (immature cohesiveness), or whether it facilitates intimacy, openness and care between group members (mature cohesiveness; see Marmarosh & Sproul, 2021). We test these hypotheses with two large and representative datasets, each involving more than 70,000 schoolchildren at 700 schools in [nation]. Our conceptual model is presented in Figure 1.

The Social Identity Approach (SIA) to health

The SIA to health provides ample empirical evidence for the proposition that memberships of social categories and related social identities enhance well-being and protect people from strain (Haslam et al., 2018). Group memberships provide many important material, psychological and normative resources that shape people's well-being and help them to face stressors (Haslam et al., 2018; Jetten et al., 2017). The SIA to health draws on the legacy of social identity (Tajfel & Turner, 1979) and self-categorization (Turner et al., 1987) theories and the two concepts – *social identification* and *shared identity* – that constitute the theoretical core.

Social identification represents both the process and degree to which people internalize social categories as an important part of the self (Chang et al., 2017; Jetten et al., 2017). Social identification strongly shapes individual well-being, and it is only when people are identified with a social category that its healing potential is realized (Cruwys et al., 2014; McNeill et al., 2014; Postmes et al., 2019; Steffens et al., 2017).

Shared identity is used at least in two ways in SIA literature. First, the self-categorization theory (Turner et al., 1987) argues that when an individual self-categorizes as a member of a salient and

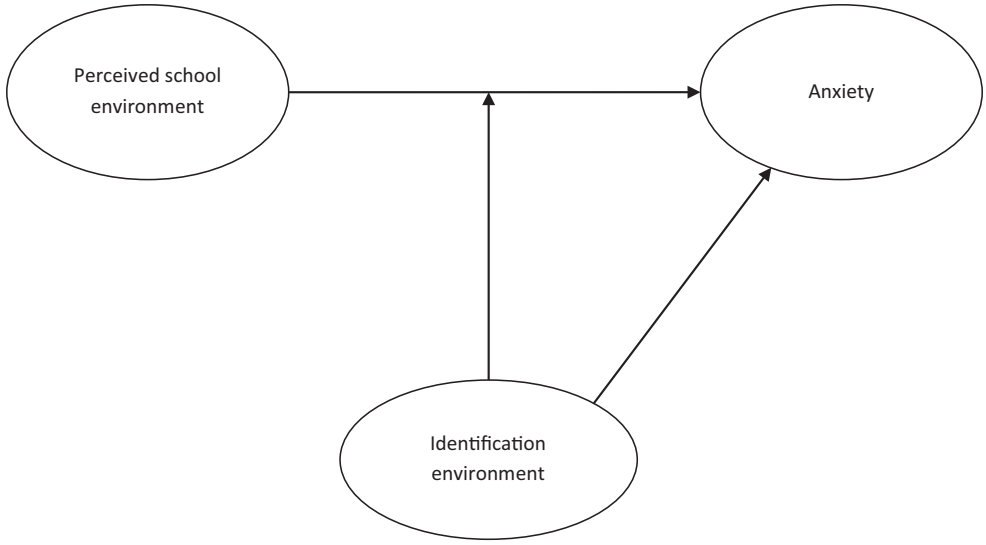

FIGURE 1 Conceptual model.

meaningful social category, individual self-perception becomes depersonalized. With this cognitive shift (Onorato & Turner, 2004), the individual's self-concept is redefined in terms of the group's prototypical norms, goals and needs – they acquire a social identity. Advocates of the SIA argue that this mechanism makes group behaviour possible (Haslam et al., 2012; Hogg, 2001), and it is essential for understanding the circumstances in which people follow norms and goals that are beneficial for their health (Jetten et al., 2017).

Second, *shared identity* also refers to a mental representation developing from a situation in which an individual *perceives* that they share the same meaningful self-category with the others (e.g. crowd members, mothers visiting the same club; cf. Reicher, 2017; Seppälä et al., 2022). This relational, communicative and experienced-based (not only cognitive) transformation leads people to internalize a sense of 'we-ness' – to see others as 'fellows' and to suppose that others feel the same (Neville et al., 2020; Reicher, 2017). This transformation enhances people's trust and motivation to cooperate, help and support each other, greatly contributing to group members' well-being (Drury et al., 2019; Khan et al., 2015; Reicher & Haslam, 2006; Seppälä et al., 2022). For the sake of clarity, we name this mental representation *sense of shared identity*.

Whereas social identification and (sense of) shared identity are usually used as individual-level constructs, we want to focus attention on the *identification environment*, which is a group-level construct.

Identification environment

We use the term *identification environment* to refer to the degree to which group members as a collective, in a delimited physical or virtual environment, have internalized the same social category as an important part of the self. This concept captures the strength and quality of identification that the group of individuals has with the social category to which its members identify, and it provides the social-psychological environment for the individual group members in a specific spatiotemporal context.

Our understanding of identification environment has much in common with the concept of *social climate*, which also relates to well-being both at the individual and the group levels (Aldridge & McChesney, 2018; Bronkhorst et al., 2015; Herr et al., 2018; Modin & Östberg, 2009; Tong et al., 2019). This elusive concept has been defined in many ways in the organizational (James & Jones, 1974; Schneider et al., 2013) and educational literature (Thapa et al., 2013; Zullig et al., 2010). Here, we

define the social climate following Katherine Reynolds' and her colleagues' formulation as the perceived quality of social relationships and interactions within a community and the values and norms that are important to the community (Lee et al., 2017; Reynolds et al., 2017). By referring to the SIA, they distinguish the concept of social climate from the concept of *social identification*, elaborating that the latter is the underlying psychological mechanism or process that explains why the social climate influences a group member's well-being, attitudes and behaviour. We see that there is an equivalent conceptual difference between the social climate and the identification environment. The social climate at the group level reflects group members' shared perceptions of relationships, norms and goals in their group, whereas the identification environment reflects the degree to which all the group members are psychologically tied to the group.

The identification environment can be estimated at least in two ways: as a *dispersion* of social identification between group members or as an *aggregate* of group members' identification. In their experimental studies, Jans et al. (2015) showed how the identification environment emerges from intragroup interaction between individuals. In Study 3, they created five-person experimental groups whose members interacted with each other asynchronously online for two weeks. They measured the strength of identification after four days and again at two weeks of interaction and used multilevel analysis to quantify the convergence of identification at the group level. The intraclass correlation (ICC) – which reports the proportion of variance that belongs to the group level (Hox, 2010) – increased from 0.18 to 0.29 between measurements. Identification with the group became 'consensualised' (Jans et al., 2015, p. 202) as the groups' identification environments became increasingly differentiated from each other over time (see also Thomas et al., 2019).

Unlike Jans et al. (2015), whose primary focus was on dispersion, we are interested in the aggregate of group members' social identification. The SIA to health predicts that strong identification increases the adherence to group's norms and unlocks psychological resources. Both these processes have the potential to further support well-being (Haslam et al., 2018). We suppose that this also applies at the group level and that strong identification environment has an independent effect over and above the individual-level effect. This is especially true in a situation where a group is large enough and the identification environment is strong enough. The stronger the identification in the group, the more resources will be available to the group as a whole and the better the well-being of all group members. In addition, in such environment adhere to group's norms will be stronger due to the group pressure and the model provided by high identified group members.

The impact of identification environment on group members is already supported by the existing literature in the organizational context. In their longitudinal study on 45 sports teams, Thomas et al. (2019) demonstrated that a strong identification environment predicted increased perceived and actual team performance. Similarly, using a sample of 60 work teams in one large company, Wang and Howell (2012) showed that a strong identification environment in teams increased both employees' performance and sense of empowerment. Furthermore Escartín et al. (2013) found that bullying was less common in companies with a strong identification environment. An exception to these trends was Junker et al.'s (2022) study of 82 work teams where the most exhausted team members worked in environments with medium-level aggregate social identification.

Although this organizational research on adult populations demonstrates the effects of strong identification environments on performance and well-being, our knowledge of other age groups, outcomes and processes remains limited (but see Prati et al., 2018 from the school context). For example, the buffering effects of an identification environment on stressor-strain relationships have not been studied. This is a significant oversight, given that researchers have long acknowledged that macro- and group-level factors influence health and well-being (Bliese & Jex, 1999; Diez-Roux, 1998).

The next section introduces the stressor and strain variables in the educational context of our study, namely, the perception of school's physical environment (stressor) and symptoms of anxiety (strain). In Finland, where this study is conducted, the quality of school buildings,– especially the indoor environment and its health effects – has been widely discussed for many years – even before the COVID-19 pandemic. As such, in Finland, students and their parents are highly aware of the health risks posed

by poor physical school environments. After considering our stressor and strain variables, we then return to the topic of identification environment, discussing how this can buffer the stressor-strain relationship.

Perceived environmental stressors and anxiety

Anxiety is an intrusive and unpleasant emotional state related to fear or apprehension of potential future threat (DSM-5, American Psychiatric Association, 2013). Among schoolchildren, anxiety symptoms are related, for example to suicidality (Hill et al., 2011), difficulties in social relationships (Kingery et al., 2010) and school impairments (de Lijster et al., 2018). Many factors can trigger anxiety but typically it is related to external stressors perceived to be uncontrollable or uncertain (Carleton, 2016; Grupe & Nitschke, 2013). There is also increasing evidence that poor physical environments (e.g. crowded, noisy, too hot, poorly lit) can induce anxiety (Beemer et al., 2021; Hoisington et al., 2019).

Physical environments do not, however, affect everyone in the same way. There is wide variability in how different people perceive and experience the same environment (Goldstone & Byrge, 2013; Witt, 2011). This variability can undermine the group's self-understanding and unity at least in two ways: (a) it threatens group identity since physical environments materialize and symbolize a group (Finell, 2019; Reicher & Hopkins, 2001) and (b) it can form a practical barrier to joining a group (Finell & Seppälä, 2018). Either scenario can then lead to negative group processes. For example, someone may decide to work at home because they perceive the air quality in the office as poor. They are then unable to meet face-to-face with colleagues who regularly work in the office, leading to negative social consequences, especially if the stay-at-homers are a small minority. The office majority may start to perceive the stay-at-homers as a deviant minority who threaten the integrity of the group and its positive self-definitions, and react negatively to them (see Branscombe et al., 1993; Marques et al., 2001) inducing anxiety among stay-at-homers (Baumeister & Tice, 1990).

The literature on technological disasters (e.g. chemical leakages) in neighbourhoods and small towns provides empirical evidence of how group members' different perceptions of the same physical environment and its health risks can lead to interpersonal conflicts, social alienation and anxiety (Cline et al., 2010; Edelstein, 2018). Similarly, in the context of workplace indoor air problems, research has shown that the situation can be particularly distressing for individuals whose perceptions of the workplace's physical environment deviate from that of other group members; those who do not recognize indoor air problems marginalize and exclude those who do, and hence these 'deviants' lack group social support and report distress (Finell & Seppälä, 2018). To the best of our knowledge, there is no previous research on what happens if a schoolchild's perception of school's physical environment deviates from that of their schoolmates. However, there is evidence that asthmatic children have an increased risk of being bullied at a school (Ancheta et al., 2023), where allergens and poor indoor air can trigger asthma symptoms (Esty & Phipatanakul, 2018). This provides indirect evidence that deviance from the shared experience of physical environment can lead to marginalization also among schoolchildren.

Thus, two factors must be considered when investigating how a school's physical environment is related to students' symptoms of anxiety: (a) students' own perceptions of their school's physical environment and (b) the degree to which those perceptions are shared by other in-group members. Therefore, we focus on the *relative* student-perceived physical environment in this study.[1]

We now pose our first two hypotheses. Based on the literature cited in this section, our first hypothesis describes the main effect of the environmental stressor:

[1]This means that we must use a group mean centred instead of a grand mean centred predictor (see Hox, 2010). Grand mean centring would not allow us to estimate to what degree a student's perception is shared with other in-group members.

H1. A student whose perception of their school's physical environment is worse than the average perception of all students within the school will report a higher level of anxiety than a student whose perception of the school's physical environment is the same as or better than the average perception of all students at the school.

Our second hypothesis describes the main effect of the identification environment:

H2. A student who studies at a school with a strong identification environment will report lower symptoms of anxiety than a student who studies at a school with a weak identification environment.

Next, we discuss whether and how the identification environment can buffer the negative mental health consequences of stressors.

Identification environment buffering stress: two competing hypotheses

Since there is no direct evidence on whether and how the *identification environment* buffers the negative well-being effects caused by stressors, we draw inferences from previous research on the sense of shared identity and cohesiveness. This research points to two competing hypotheses (H3a vs. H3b).

First, Ozeki (2015) showed that a strong identification environment promotes frequency of interaction, emotional bonds and interdependence between group members. This points to the possibility that an identification environment facilitates group members' sense of shared identity. If so, this suggests that the identification environment can also buffer stress in contexts where the external stressor is not perceived similarly by the entire group. By promoting intimacy between group members (Neville & Reicher, 2011), a sense of shared identity helps group members to know each other better and may increase perspective taking (Hollarek & Lee, 2022; Ku et al., 2015). A sense of shared identity may also increase people's willingness to accept support from others and unlock psychological resources to provide support to others (Haslam & Reicher, 2006). Finally, it may help to tolerate intergroup diversity (Stevenson & Sagherian-Dickey, 2016) and increase collective resilience to adversity (Drury et al., 2019). Thus, in schools with strong identification environments, students can be expected to trust each other, be more willing to provide mutual support and be more tolerant of those who deviate from the norm of the 'prototypical member'. That is, their group is in stage of 'the mature cohesiveness' (Marmarosh & Sproul, 2021). Therefore, perceived poor physical environment will be less predictive of anxiety in schools with a strong identification environment than in schools with a weak identification environment. It follows that:

H3a. A student studying at a school with a weak identification environment and whose perception of the school's physical environment is worse than the average perception of all students within the school will report a higher level of anxiety than a student studying at a school with a strong identification environment and whose perception of the school's physical environment is worse than the average perception of all students at the school.

Second, the level of identification environment may also reflect 'immature cohesiveness' (Marmarosh & Sproul, 2021), and this literature points to the opposite hypothesis. Members of cohesive groups can be highly identified by the process of self-categorization, and they may share depersonalized prototype-based attitudes (Hogg, 2001). Given that cohesiveness can be defined as a depersonalized liking for prototypical group members (Hogg, 1993), it is possible that a highly cohesive group is less tolerant of non-prototypical members than a less cohesive group, especially of members who threaten its prototypical integrity and positive self-definitions (Hogg, 2001). This is in line with

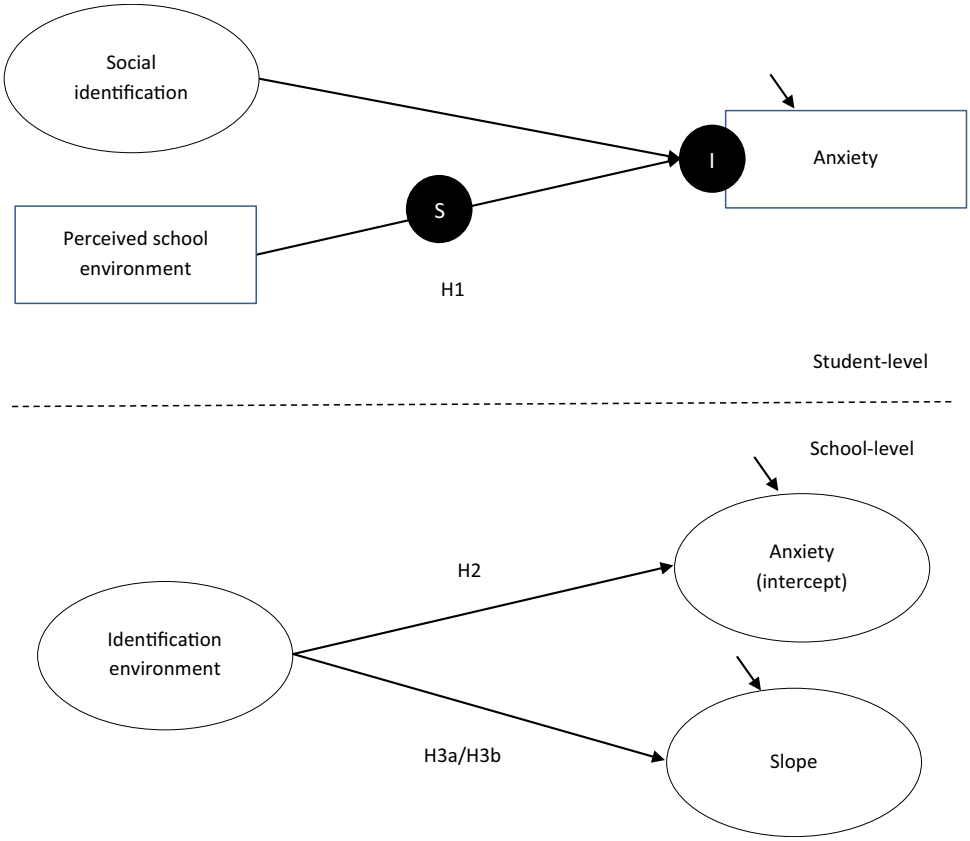

FIGURE 2 Statistical model and hypotheses. *Note*: At the student level, the solid black circle 'I' corresponds to random intercept, and the solid black circle 'S' corresponds to random slope. Perceived school environment is group mean centred.

research on the 'black-sheep effect', the rejection of group members who violate in-group norms (Marques et al., 2001; Marques & Yzerbyt, 1988). This effect is stronger among individuals who are highly identified with their in-group (Branscombe et al., 1993; Eidelman & Biernat, 2003) and may be promoted in high identification environments. Thus, it is possible that students whose perception of the school's physical environment deviates from the majority perception, especially in more a negative direction, may lack social support and face dislike or even bullying from fellow in-group members at strong identification environment schools. Perceived physical environment will then be more strongly associated with anxiety than in schools with weaker identification environment. Thus, the competing hypothesis to H3a is:

> **H3b.** A student studying at a school with a strong identification environment and whose perception of the school's physical environment is worse than the average perception of all students at the school will report a higher level of anxiety than a student studying at a school with a weak identification environment and whose perception of the school's physical environment is worse than the average perception of all students at the school.

Our conceptual model is presented in Figure 1, and our statistical model and hypotheses are presented in Figure 2.

MATERIALS AND METHODS

Data and participants

Our results are based on secondary analyses of the School Health Promotion data collected in 2017 and 2019. The School Health Promotion study is a nationwide classroom survey that has monitored the health and well-being of Finnish adolescents since 1996, and it is conducted by the Finnish Institute for Health and Welfare. Information from the School Health Promotion study is used in the planning and evaluation of health promotion in schools and municipalities. Nationally, the information can also be used to monitor and evaluate the implementation of policy programmes and various laws. The data collection in 2017 (THL/1704/6.02.01/2016) and 2019 (THL/1578/6.02.01/2018) was approved by the Finnish Institute for Health and Welfare's ethical committee. Data were collected in compliance with APA ethical standards. This study's design and its analysis were not preregistered. [2]

The data focus on students in years eight and nine of schooling (i.e. 14–16 years old). The students were informed of the aim and content of the survey, and they had the opportunity to decline participation. Their parents and guardians were also informed. Written consent was not necessary since the survey was conducted anonymously. The data were collected during school lessons. In 2017, 84% of Finland's lower-secondary *schools* participated in the study; in 2019, this figure was 87%. The data cover 63% of Finland's eight and nine grade *students* in 2017 and 73% in 2019. We present the results of each data set separately because we want to demonstrate that the findings are almost identical, even though there were two years between the data collection rounds.

In 2017, 73,680 students responded to the questionnaire. We excluded from our analyses students who did not report their age or reported that their age was less than 13 ($N = 911$). Then we excluded students who studied in schools that provided special education (or for whom information was missing; $N = 1352$), and finally schools with fewer than five students ($N = 25$). The final data set consisted of 71,392 students from 678 schools. The average school size was 105 students, ranging between 5 and 431 students. In 2019, 87,343 students answered the questionnaire. The exclusion criteria were the same: students who studied in schools that provided special education or studied abroad ($N = 531$), students less than 13 ($N = 786$) and schools with fewer than 5 students ($N = 37$). The final data set consisted of 85,989 students from 704 schools. The average school size was 122 students, ranging between five and 414 students.[3]

Measures

Predictor

The perceived quality of the school's physical environment (i.e. perceived school environment) was measured by nine items: 'Have any of the following things bothered you at your school during this school year? (a) Too hot inside; (b) too cold inside; (c) stuffy air (bad indoor air); (d) unpleasant odour; (e) crowded classroom; (f) noise; (g) lighting too bright or too dim; (h) uncomfortable chairs, desks or other furniture; (i) poor facilities (toilets, changing rooms, showers)'. These items were measured on a three-point scale (1 = not at all, 2 = somewhat, 3 = a lot). The McDonald's omegas were good (2017: 0.81; 2019: 0.80; see Hayes & Coutts, 2020; McNeish, 2018).

A mean individual rating of the items was calculated. If the respondent had answered fewer than five items, the score was not calculated. Then the individual mean rating was group mean centred, that

[2]The data are available from the Finnish Institute for Health and Welfare but were used under licence for the current study, and so are not publicly available. Data are available upon request with permission of the Finnish Institute for Health and Welfare.

[3]We assure that all measures and exclusions are reported.

is, the mean of the perceived school environment for each school was subtracted from each individual student score. Group mean centring allowed us to test the *relative* student-perceived environment within a school. Group mean centring is also recommended when random slopes are tested in multilevel modelling (Enders & Tofighi, 2007). The perceived environment was used only as a student level variable since it was group mean centred (Hox, 2010).

Outcome variable

Anxiety was measured by the Generalized Anxiety Disorder Assessment (GAD-7), a brief self-reporting scale designed to assess the severity of anxiety symptoms and identify probable cases of generalized anxiety disorder (Spitzer et al., 2006). GAD-7 performs especially well as a measure of anxiety symptom severity (Beard & Björgvinsson, 2014). The instrument indicates how often, over the previous two weeks, the respondent has been bothered by each of the seven core symptoms (e.g. feeling nervous, anxious or on edge; not being able to stop or control worrying). These items are measured on a four-point scale (0 = not at all, 1 = on several days, 2 = on most days, 3 = practically every day). A sum of the items was calculated. The sum score could range from 0 to 21 as follows: 0–4 (no anxiety), 5–9 (mild anxiety), 10–15 (moderate anxiety), 16–21 (severe anxiety; Spitzer et al., 2006). In this study, the measure was used as a continuous variable. No missing answers were allowed in the analyses. The McDonald's omegas were good (2017: 0.92; 2019: 0.92; see Hayes & Coutts, 2020).

Moderator

Identification with the school community was measured by one item: 'I feel I am an important part of my school community'. Social identification has shown to be a sufficiently homogeneous construct to be operationalized with a single item (Postmes et al., 2013), and the recent literature shows that single items are usually both reliable and valid measures (Allen et al., 2022; Matthews et al., 2022). The item was measured on a five-point scale and was recoded so that a higher score indicated a stronger identification (1 = fully disagree to 5 = fully agree). Similar kinds of item have been used also before to measure social identification (Cameron, 2004; Fong et al., 2019; Lee et al., 2017) and in addition to self-categorization, it reflects 'the psychological ties that bind the self to the group' (Cameron, 2004, pp. 242). This variable was inserted as a latent factor in the model. That is, the responses were decomposed into two uncorrelated latent factors by Mplus. In our case, the first component represented the deviation of students' answers from their school mean (e.g. social identification at the student level). The second component represented the school mean (e.g. identification environment at the school level), and it reflected the deviation of each school mean from the grand mean (Asparouhov & Muthén, 2006).

Background variables

Student's gender, *student's age* and *parents' level of education* were used as both student level and school level background variables. We used the average of father's and mother's levels of education as an indicator of student socio-economic status (2017: $r = .593$; 2019: $r = .603$; Thaning & Hällsten, 2020). Their response options were: 1 = comprehensive school or equivalent (i.e. primary level), 2 = upper-secondary school, high school or vocational education institution (i.e. secondary level), 3 = occupational studies in addition to upper-secondary school, high school or vocational education institution (i.e. secondary level and occupational studies), 4 = university, university of applied sciences or other higher-education institution (i.e. tertiary level). All the background variables were centred by their grand means and inserted as latent factors at both levels (see section Analytical methods). See link to the whole questionnaire https://thl.

fi/en/web/thlfi-en/research-and-development/research-and-projects/school-health-promotion-study/questionnaires.

Analytical methods

We built two multilevel linear regression models (four steps in each; Hox, 2010; Snijders & Bosker, 2012) and then estimated them using Mplus statistical software 7.0 (Muthén & Muthén, 1998). Full information maximum likelihood estimation (FIML) with robust standard errors (MLR estimator in Mplus) was used as the estimation method. MLR is a robust method that moderates the effects of violations of assumptions such as non-normality (Hox et al., 2010). The proportion of missing values varied between the variables, from 0% to 14% of cases. Socio-economic status (parents' education) had the highest percentage of missing values in both years (2017: 14%; 2019: 11%). In order to deal with missing data, we used FIML estimation because it produces unbiased values of parameters by determining the value that maximizes the likelihood function based on all available data (Enders & Bandalos, 2001). Values were assumed to be missing at random (Enders, 2010; Rubin, 1976).

First, we estimated a null model for each variable. In a null model, there is only one variable – variance at student and school levels and the ICC. The ICC reports the proportion of variance that belonged to the school level (Hox, 2010). Then we calculated the design effect (DEFF) of each variable (Table 2). This measure is used to estimate whether multilevel modelling is needed, that is if the DEFF of the outcome variable is greater than 1.1 (Lai & Kwok, 2015). DEFF is estimated as a function of the ICC and average cluster size (Lai & Kwok, 2015; Muthén & Satorra, 1995).[4]

Second, we estimated two random intercept models for both years (two for the 2017 data and two for the 2019 data, see Table 4, steps 1–2, see syntax in the Appendix S1) to test whether perceived school environment (H1) and identification environment (H2) were associated with anxiety. In the random intercept model, the intercept coefficients varied across schools. With the exception of perceived school environment, which was group mean centred, all the other explanatory variables were inserted as latent factors into the models. In this method, covariates were decomposed into two uncorrelated latent factors by Mplus. As explained above, in our case, the first component represented the deviation of students' answers from their school mean. The second component reflected the deviation of each school mean from the grand mean (Asparouhov & Muthén, 2006).

Finally, we tested our third hypothesis, which comprised two competing hypotheses (H3a and H3b), by building two random intercept and slope models for both years (Table 5, steps 3–4, see syntax in the Appendix S1). First, we tested whether there was significant variability between slopes (step 3). Then we tested whether identification environment explained this variability (i.e. cross-level interaction, step 4). The final statistical model is presented in Figure 2.

We report both the unstandardized and standardized estimates (i.e. when the predictor increases by one standard deviation, the outcome variable increases by the standardized estimate) as well as separate R^2s for both the student and school levels, provided by Mplus (Muthén, 1998).

RESULTS

The descriptives of all variables are reported in Table 1. In 2019, students reported higher symptoms of anxiety and weaker identification with their school community than in 2017. They were also older, and their parents' education was higher. The perceived school environment and gender distribution were similar in each year.

First, we analysed the null models (Hox, 2010). The within and between variance, ICC and DEFF of perceived school environment, anxiety and school identification are reported in Table 2. All the within

[4]DEFF = 1 + (cluster size − 1) × ICC.

TABLE 1 Descriptives of background variables, predictors and outcome variables from raw data.

	2017			2019			
	Mean (*SD*) or %	Min.–max.	*N*	Mean (*SD*) or %	Min.–max.	*N*	*t*-Test/Chi-squared test
Perceived school environment	1.72 (0.44)	1–3	70,877	1.73 (0.44)	1–3	85,648	1.44
Anxiety	3.84 (4.85)	0–21	68,840	4.06 (4.85)	0–21	83,480	9.04***
Social identification	3.61 (1.08)	1–5	65,882	3.29 (1.04)	1–5	84,923	−58.05***
Gender (female)	51		35,871	51		43,568	0.92[a]
Age (years)	14.85 (0.72)	13–18	71,392	15.34 (0.64)	13–19	85,989	140.36***
Parents' education	2.92 (0.88)	1–4	61,731	3.01 (0.87)	1–4	76,230	18.76***

[a]Chi-squared test.

***$p < .001$.

TABLE 2 Within and between variance, ICC and DEFF of main variables.

	N_w	N_b	σ^2_W	σ^2_B	ICC	DEFF
Perceived school environment (2017)	70,877	678	0.178	0.016	0.082	9.49
Perceived school environment (2019)	85,648	704	0.178	0.015	0.079	10.53
Anxiety (2017)	68,840	678	23.306	0.266	0.011	2.11
Anxiety (2019)	83,480	704	23.226	0.294	0.012	2.41
Social identification (2017)	65,882	678	1.161	0.015	0.013	2.25
Social identification (2019)	84,923	704	1.068	0.017	0.015	2.79

Abbreviations: DEFF, design effect; ICC, intraclass correlation; N_B, sample size at the school level; N_w, sample size at the student level; σ^2_B, school level variance; σ^2_W, student level variance.

and between variances were significant at the $p < .001$ level. Although the between-school variances of anxiety were only 1% of the total variance, their DEFFs were twice as big. For example, the DEFF of 2.11 indicates that the sampling variance of the mean is two times larger than if the student sample had been drawn from a simple random population, and that multilevel modelling is needed (see Lai & Kwok, 2015; Table 2). The ICCs of social identification and anxiety were similar. Their variances within a school were much larger that between schools. Perceived school environment had the biggest ICC in both years and larger proportion of its variance belonged to the school level than that of social identification and anxiety.

The pairwise correlations of the main variables are reported in Table 3. All the correlations were significant at both the student and school levels. At the student level, perceived school environment was negatively correlated with school identification and positively correlated with anxiety both years. This means that there was a significant association between how harmful a student perceived the school environment to be *relative* to their schoolmates' average perception and the student's weak school identification. Correspondingly, this harmfully perceived school environment was associated with the student's increased anxiety. At the school level, weak identification environment was strongly correlated with increased anxiety both years.

Random intercept models (H1 and H2)

Next, we tested our random intercept models. All the models were adjusted by gender, age and parents' level of education as an indicator of students' socio-economic status. In step 1 (Table 4), we tested

TABLE 3 Pairwise correlation coefficients between main variables estimated using FIML with robust standard errors.

	Student level (N = 70,400–71,074)		School level (N = 678)
2017	**1**	**2**	**3**
1. Perceived school environment[a]	–	–	–
2. Social identification	−0.135***	–	–
3. Anxiety	0.324***	−0.333***	–
4. Identification environment			−0.537***
	Student level (N = 85,829–85,869)		**School level (N = 704)**
2019	**1**	**2**	**3**
1. Perceived school environment[a]	–	–	–
2. Social identification	−0.208***	–	–
3. Anxiety	0.353***	−0.320***	–
4. Identification environment			−0.587***

[a]Group mean centred.

***$p < .001$.

whether perceived school environment was associated with anxiety, using a random intercept model. The association was significant for both years. Note that the perceived environment was group mean centred. This means that the more harmful a student perceived the school environment to be *relative* to her schoolmates' average perception, the more anxious the student was. In 2017, this model explained 19% of total variance at the student level and 35% at school level. In 2019, the model explained 21% of total variance at the student level and 52% at school level.[5] These results support our first hypothesis: a student whose perception of the school's physical environment is worse than the average perception of all students within the school will report a higher level of anxiety than a student whose perception of the school's physical environment is the same as or better than the average perception of all students within the school.

In step 2 (Table 4), we included social identification at the student level and identification environment at the school level. Both associations were significant in both years. At the student level, the more identified a student was with the school community, the less the student reported symptoms of anxiety. At the school level, the stronger a school's identification environment, the less the students at that school reported anxiety. Perceived environment was still a significant predictor in both years. In 2017, this model explained 25% of total variance at the student level and 49% at school level. In 2019, the model explained 26% of total variance at the student level and 65% at school level. These results support our second hypothesis: a student who studies at a school with strong students' identification environment reports lower symptoms of anxiety than a student who studies at a school with weak students' identification environment.

Random intercept and slope models and cross-level interactions (H3)

In step 3 (Table 5), we investigated whether the relationship between student level perceived school environment and anxiety scores varied across schools. The variances of the random slopes (σ_s^2) were significant in both years (2017: σ_s^2=.812, $p < .001$; 2019: σ_s^2=.682, $p < .001$), indicating that schools differed from each other in how the perceived school environment was associated with anxiety. Since the slope standard deviation was 0.90 in 2017 and 0.83 in 2019, and the random slopes were normally

[5]The difference between years in the school level R^2 is due to gender. If only age and parents' education are inserted as background variables in step 1, the difference between R^2s is only .05 at the school level. When gender is inserted, the difference increases. The school level correlation between gender and anxiety is r = .53 in 2017 and r = .72 in 2019 (step 1). Girls are more anxious than boys.

TABLE 4 Random intercept models with anxiety as a dependent variable and perceived environment (Step 1) and identification environment (Step 2) as independent variables, adjusted by age, gender and parents' level of education.

	Step 1: Random intercept and fixed slope without identification environment				Step 2: Random intercept and fixed slope with identification environment			
2017	***B***[a]	***SE***	**95% CI**	***β***[b]	***B***[a]	***SE***	**95% CI**	***β***[b]
Intercept	3.83				3.84			
Student level								
Perceived school environment[c]	3.15	0.06	3.04–3.27	0.27	2.86	0.06	2.75–2.97	0.25
Social identification					−1.11	0.02	−1.14–(−1.07)	−0.25
School level								
Identification environment					−1.83	0.28	−2.38–(−1.27)	−0.42
Variance components								
Student level residual variance	18.24	0.19	17.87–18.61		16.85	0.18	16.50–17.19	
School level residual variance	0.20	0.03	0.14–0.25		0.16	0.02	0.11–0.20	
R_w^2	0.19				0.25			
R_b^2	0.35				0.49			
2019	***B***[a]	***SE***	**95% CI**	***β***[b]	***B***[a]	***SE***	**95% CI**	***β***[b]
Intercept	4.05				4.06			
Student level								
Perceived school environment[c]	3.41	0.05	3.30–3.51	0.30	2.93	0.05	2.83–3.03	0.25
Social identification					−1.06	0.02	−1.09–(−1.02)	−0.23
School level								
Identification environment					−1.75	0.26	−2.27–(−1.24)	−0.40
Variance components								
Student level residual variance	17.72	0.17	17.38–18.06		16.62	0.16	16.31–16.94	
School level residual variance	0.16	0.03	0.11–0.22		0.12	0.02	0.08–0.16	
R_w^2	0.21				0.26			
R_b^2	0.52				0.65			

Note: 2017: student level $N = 58{,}489$–$59{,}871$; school level $N = 678$; 2019: student level $N = 73{,}597$–$74{,}307$; school level $N = 704$.

Abbreviations: 95% CI, 95% confidence interval; R_b^2, *R* square at the school level; R_w^2, *R* square at the student level; *SE*, standard error.

[a]Unstandardized slope (*B*).

[b]Standardized slope (β).

[c]Group mean centred.

distributed, it was possible to calculate the 95% range of fixed slopes, within which the schools fell (see Snijders & Bosker, 2012). The 95% range of unstandardized slopes (*B*) was 1.05 and 4.65 in 2017. This means that in 'low slope schools', a one-unit increase in perceived environment (i.e. the school's physical environment was perceived as more harmful) increased student anxiety by only one unit. In contrast, in 'high slope schools', a one-unit increase in perceived environment increased anxiety scores by more than 4.6 units. The diagnostic cut value of mild anxiety is five and moderate anxiety is 10 in GAD-7 (Spitzer et al., 2006), so this increase can be considered relatively high. The standardized slopes (β) were 0.09 and 0.40. The 95% range of unstandardized slopes (*B*) in 2019 was 1.32 and 4.63, and standardized slopes (β) was 0.11 and 0.40.

The random slopes significantly co-varied with the intercepts at probability level $p < .001$ in both years. The correlation (*r*) was .66 in 2017 and .54 in 2019. This means that in schools where the association between perceived school environment and anxiety was stronger, the level of anxiety was also

TABLE 5 Random intercept and slope models with anxiety as a dependent variable, perceived environment as an independent variable and identification environment as cross-level moderator.

	Step 3: Random intercept and random slopes				Step 4: Cross-level interaction			
2017	***B***[a]	***SE***	**95% CI**	***β***[b]	***B***[a]	***SE***	**95% CI**	***β***[b]
Intercept	3.83				3.83			
Student level								
Social identification	−1.11	0.02	−1.14–(−1.07)	−0.25	−1.10	0.02	−1.14–(−1.07)	−0.25
School level								
Identification environment	−1.46	0.26	−1.97–(−0.95)	−0.33	−1.91	0.28	−2.46–(−1.36)	−0.44
Cross-level interaction					−2.29	0.59	−3.44–(−1.14)	−0.32
Step 3: slope mean Step 4: slope intercept	2.85	0.06	2.74–2.96		2.86	0.06	2.75–2.97	
Variance components								
Student level residual variance (anxiety)	16.72	0.18	16.38–17.06		16.72	0.18	16.38–17.06	
School level residual variance (anxiety)	0.18	0.03	0.13–0.23		0.18	0.03	0.13–0.22	
Random slope (step 4: residual) variance	0.81	0.12	0.57–1.05		0.74	0.12	0.50–0.98	
Intercept-slope covariance	0.33	0.05	0.24–0.42		0.31	0.04	0.22–0.39	
2019	***B***[a]	***SE***	**95% CI**	***β***[b]	***B***[a]	***SE***	**95% CI**	***β***[b]
Intercept	4.06				4.06			
Student level								
School identification	−1.05	0.02	−1.09–(−1.02)	−0.23	−1.05	0.02	−1.09–(-1.02)	−0.23
School level								
Identification environment	−1.60	0.25	−2.09–(−1.11)	−0.37	−1.98	0.27	−2.50–(−1.45)	−0.46
Cross-level interaction					−2.05	0.49	−3.01–(−1.08)	−0.33
Step 3: slope mean	2.97	0.05	2.87–3.08		2.97	0.05	2.87–3.07	
Step 4: slope intercept								
Variance components								
Student level residual variance (anxiety)	16.51	0.16	16.19–16.82		16.51	0.16	16.20–16.83	
School level residual variance (anxiety)	0.15	0.02	0.11–0.19		0.14	0.02	0.10–0.18	
Random slope (step 4: residual) variance	0.68	0.09	0.50–0.86		0.61	0.09	0.43–0.80	
Intercept-slope covariance	0.26	0.04	0.19–0.33		0.24	0.03	0.17–0.30	

Note: 2017: student level $N = 58{,}489$; school level $N = 678$; 2019: student level $N = 73{,}597$; school level $N = 704$.

Abbreviations: 95% CI, 95% confidence interval; *SE*, Standard error.

[a]Unstandardized slope (*B*).

[b]Standardized slope (β).

higher. Since allowing slopes to vary between level units (i.e. schools) does not necessarily explain additional variance in the model, R^2s are not reported in steps 3 and 4 (see Lorah, 2018). The significant variances of random slopes allowed us to test cross-level interactions for both years.

In step 4 (Table 5), we tested whether identification environment explained the variance of the random slopes. This relationship was significant in both years, 2017: standardized slope (β) = −0.32,

$p < .001$; 2019: standardized slope (β) = −0.33, $p < .001$. The comparison of slopes showed that the association between perceived school environment and anxiety was weaker in schools where identification environment was one standard deviation higher than the mean, 2017: unstandardized slope (B) = 2.54, standardized slope (β) = 0.22; 2019: unstandardized slope (B) = 2.68, standardized slope (β) = 0.23, than in schools where identification environment was one standard deviation lower than the mean, 2017: unstandardized slope (B) = 3.12, standardized slope (β) = 0.27; 2019: unstandardized slope (B) = 3.23, standardized slope (β) = 0.28. This means that a student who perceived that her school's physical environment was worse than the average perception of all students within the same school was less anxious in a school with a strong identification environment, compared to a school with a weak identification environment. The mean difference between these students was about 0.72 and 0.76 anxiety scores in 2017 and 2019 (respectively) at one standard deviation above the mean in perceived school environment (Figures 3 and 4). However, the mean difference increased to 1.46 scores in 2017 and 1.43 scores in 2019 when we compared (a) a student in a school with strong identification environment and a slope (anxiety regressed on perceived school environment) that was one standard deviation below the mean and (b) a student in a school with weak identification environment and a slope (anxiety regressed on perceived school environment) that was one standard deviation above the mean (Figures 5 and 6). The identification environment explained 9% and 10% of the variance in slopes across schools in 2017 and 2019, respectively. These findings supported our competing hypothesis 3a: a student who studied in a school with a weak identification environment and whose perception of the school's physical environment was worse than the average perception of all students within the school reported a higher level of anxiety than a student who studied in a school with a strong identification environment whose perception of the school's physical

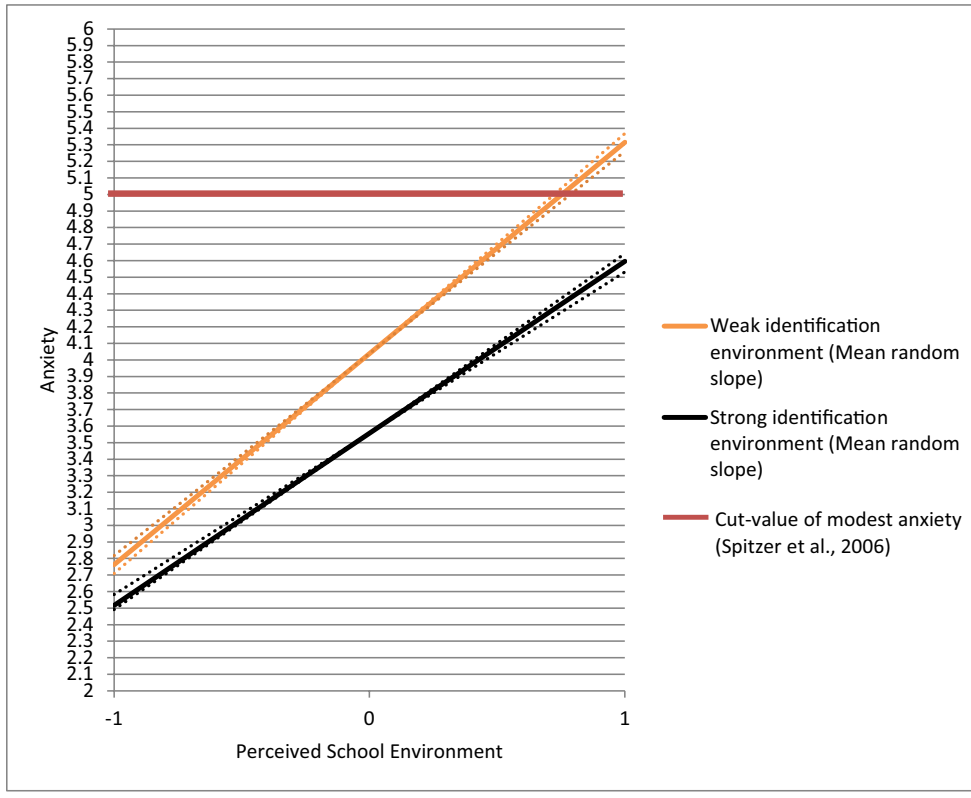

FIGURE 3 Cross-level interaction: student-perceived physical school environment and anxiety modified by school's identification environment and 95% confident intervals in 2017 data. *Note*: N = 58,489 Students; N = 678 Schools.

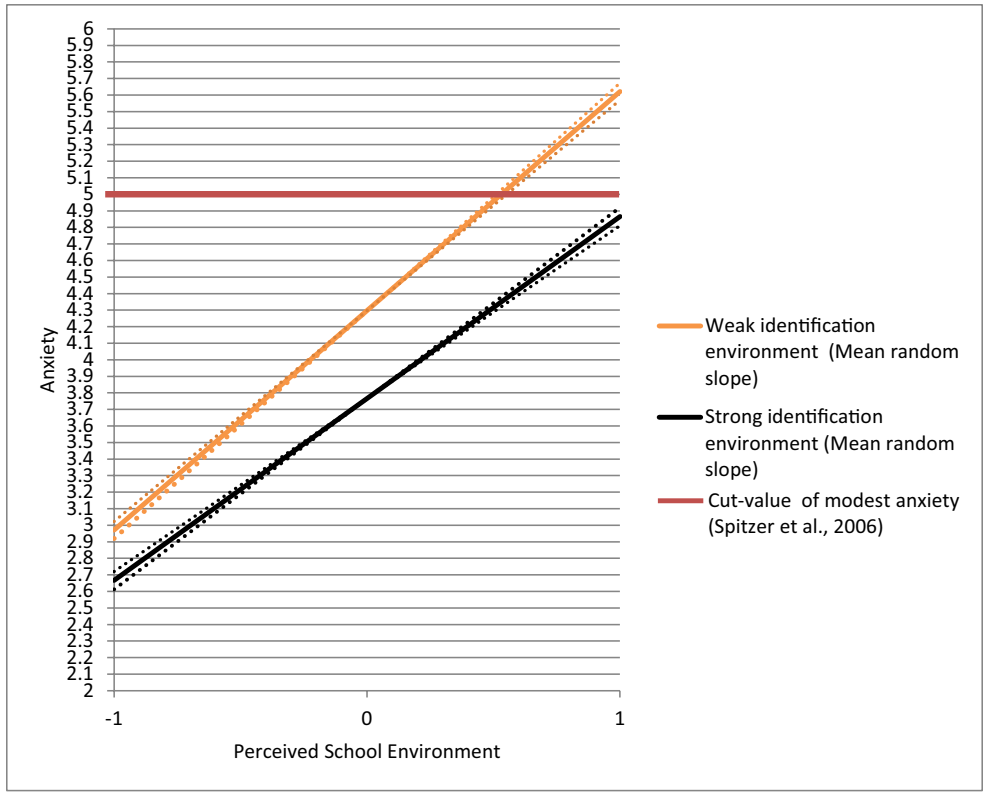

FIGURE 4 Cross-level interaction: student-perceived physical school environment and anxiety modified by school's identification environment and 95% confident intervals in 2019 data. *Note*: $N = 73{,}597$ students; $N = 704$ schools.

environment was worse than the average perception of all students within the school. We found no evidence for the black sheep effect.[6]

Background variables

In the final model (Table 5, step 4), gender was the strongest predictor among the background variables. At the student level, girls, 2017: standardized slope (β) = 0.24, $p < .001$; 2019: standardized slope (β) = 0.27, $p < .001$, and older students, 2017: standardized slope (β) = 0.07, $p < .001$; 2019: standardized slope (β) = 0.07, $p < .001$, reported more symptoms of anxiety than boys and younger students. At the school level, the more girls there were in a school, the more students reported anxiety symptoms, 2017: standardized slope (β) = 0.29, $p < .001$; 2019: standardized slope (β) = 0.38, $p < .001$. However, at the school level, age was a significant predictor only in 2017, standardized slope (β) = 0.14, $p = .017$.

The association between parents' education and anxiety was statistically significant but substantively small at the student level, 2017: standardized slope (β) = −0.02, $p < .001$; 2019: standardized slope (β) = −0.03, $p < .001$. However, at the school level, the relationship was not only statistically significant but also larger: higher the parents' average education, the higher the students' degree of anxiety in that school, 2017: standardized slope (β) = 0.13, $p = .013$; 2019: standardized slope (β) = 0.12, $p = .012$.

[6]Furthermore, we conducted a robustness check. In this check we estimated a model where anxiety predicted perceived physical environment. In this model, the cross-level interaction was not significant ($p = .143$–$.457$; see Appendix S2).

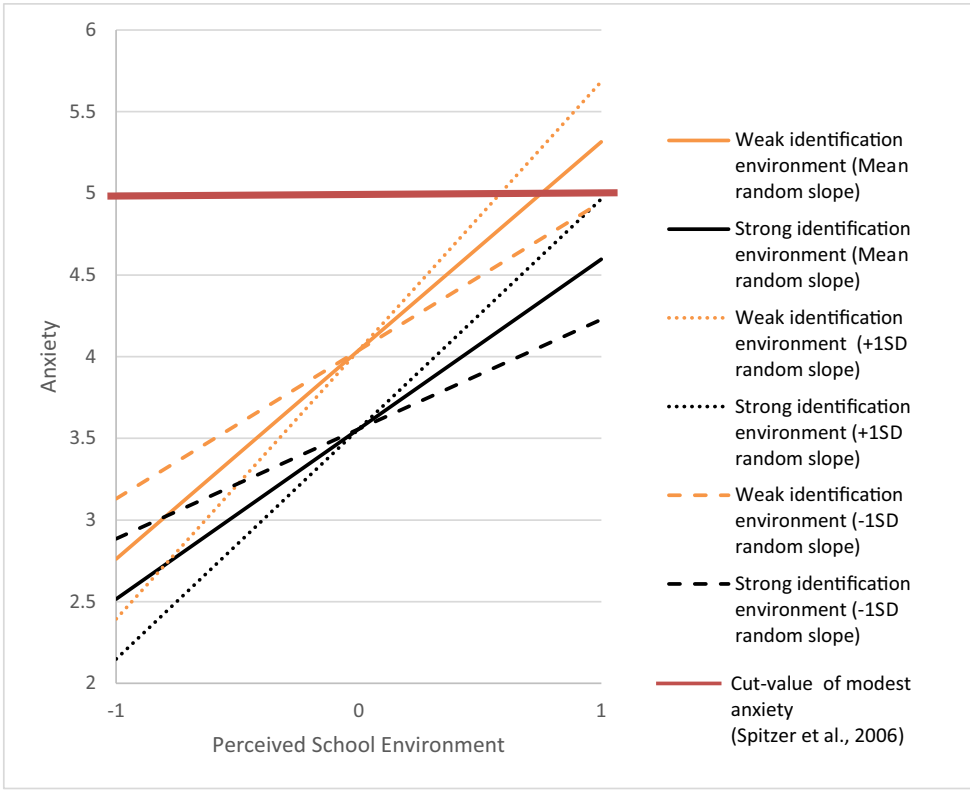

FIGURE 5 Cross level interaction: −1 standard deviation to +1 standard deviation random slopes between student-perceived physical school environment and anxiety modified by school's identification environment in 2017 data. *Note*: $N = 58{,}489$ students; $N = 678$ schools.

DISCUSSION

We found that students reported higher levels of anxiety when they (1) perceived the school's physical environment to be worse than the average perception at their school, (2) had low school identification and (3) attended a school with weak identification environment. In addition, we found that a strong identification environment at school could buffer the negative mental health consequences of a stressor for individuals. These findings were demonstrated twice with two large representative samples.

Our results contribute to the literature on the SIA to health in four important ways. First, although the SIA literature has shown that group memberships and social identification can be health and well-being promoting (Haslam et al., 2018; Jetten et al., 2012, 2017), only a few published studies have used multilevel designs to investigate the association between identification environment and mental well-being. For instance, Junker et al. (2022) showed a curvilinear association between the identification environment and exhaustion and Wang and Howell (2012) an association between the identification environment and the sense of empowerment (see also Prati et al., 2018 and a theoretical article of Häusser et al., 2020). To the best of our knowledge, this study is the first to analyse whether the identification environment modifies the association between the group mean centred stressor and the strain.

Second, as suggested in the introduction, an identification environment can reflect 'immature group cohesiveness' (Hogg, 2001; Marmarosh & Sproul, 2021), but it may also facilitate the development of 'mature cohesiveness' (see Marmarosh & Sproul, 2021). Immature group cohesiveness can lead to the exclusion of deviant 'black sheep' group members (Hogg, 1993, 2001), but our results showed that a strong identification environment helped deviant students to withstand the distress caused by an

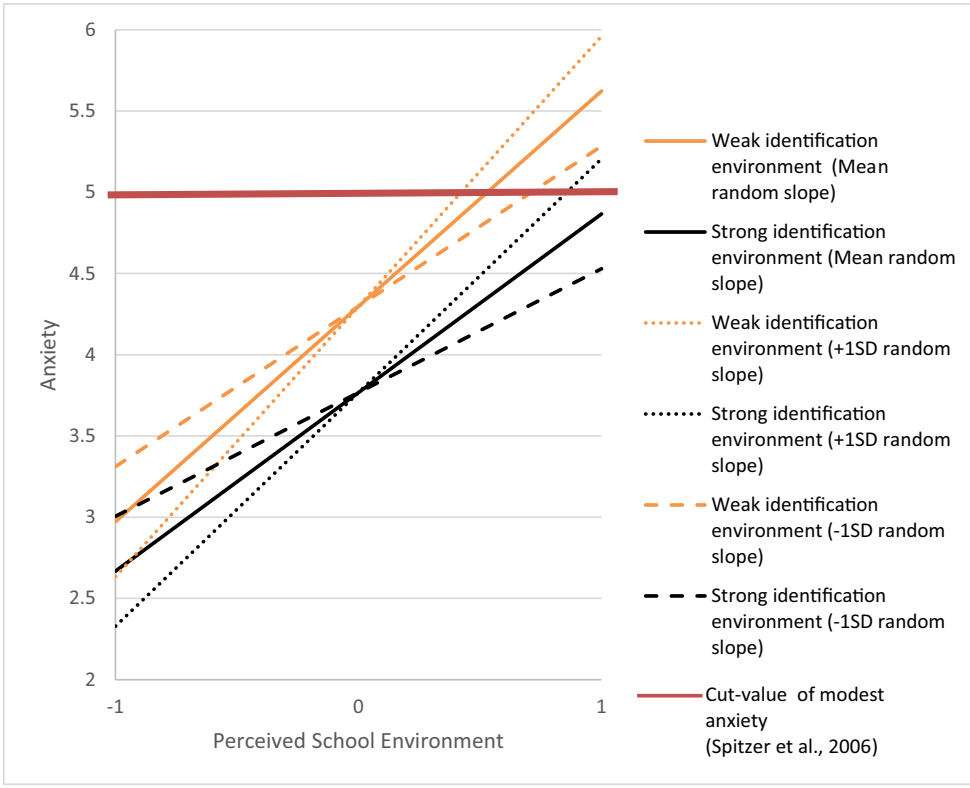

FIGURE 6 Cross-level interaction: −1 standard deviation to +1 standard deviation random slopes between student-perceived physical school environment and anxiety modified by school's identification environment in 2019 data. *Note*: $N = 73{,}597$ students; $N = 704$ schools.

external stressor. Thus, we propose that the identification environment may facilitate positive interactions and interdependence (Ozeki, 2015), which may help individuals to create a sense of shared identity and in this way foster 'mature cohesiveness'. A sense of shared identity helps to create intimate relationships and promotes reciprocal support (Neville et al., 2020), which further help people to manage anxiety (Hefner & Eisenberg, 2009; Stewart & Suldo, 2011).

Third, we used multilevel modelling, which has seldom been used when applying the SIA to health. Multilevel modelling requires at least 20–50 group-level clusters (Maas & Hox, 2005), and collecting such data can be more demanding than collecting individual-level data. In addition, even with 50 clusters, there might not be enough statistical power to detect weaker between-level effects. Our cluster size was 678 and 704, which can be considered a large sample size compared to many other studies using multilevel modelling. In our data, only 1% of the variance of social identification belonged to the school level (i.e. identification environment). This means that the difference in students' identification with their school community was considerable larger within school than between schools. However, it is important to bear in mind that this does not mean that the variability at the school level was meaningless: the ICC reflects only the proportional share (Hox, 2010), and between-level variance can still be significant even if its proportional share is small. In other contexts, the ICC of social identification has been reported to be much larger (Jans et al., 2015; Ozeki, 2015). Our small ICCs may reflect the relative homogeneity of the Finnish school system, which has been demonstrated in many studies (Bastos, 2017). Overall, our study provides an example of the different possibilities that multilevel modelling offers in SIA-related applications. For example, group mean centring is a good tool for investigating normative or comparative processes. Also, cross-level interaction offers an interesting method to study how different group-level processes influence associations between stressors and their outcomes.

Finally, the impact of the physical environment on well-being is rarely analysed in the SIA. An exception is provided by work dealing with natural catastrophes such as floods (Ntontis et al., 2018) or earthquakes (Drury et al., 2016). This research theme demonstrates that environmental problems can be related to many processes that are also relevant to the SIA. The present study contributes to this research corpus, showing that not only natural disasters but also problems in everyday (built) environments provide a context that is both theoretically and empirically important for the SIA. The human-made environment influences people's mental health (Beemer et al., 2021; Hoisington et al., 2019), but the ways in which it does so are partly influenced by group processes (Edelstein, 2018; Finell & Seppälä, 2018).

Our findings also have significant practical implications for the educational context and policy makers in the time when the COVID-19 pandemic has brought to people's attention globally the importance of good indoor environmental quality (Agarwal et al., 2021), as well as increased anxiety symptoms among schoolchildren (Racine et al., 2021). Regular maintenance and renovation of school buildings are needed, along with practices that reinforce the identification environment. The two factors are interrelated since good social climate increases identification (Tong et al., 2019), but a poor physical environment negatively impacts the social climate (Finell et al., 2021). Further research is needed to better understand how the interrelationship between school's physical and social environments influences mental health.

Given that our data are cross-sectional, our ability to draw causal inferences from our findings is limited. Our reasoning for the directions of our proposed effects is, however, strongly based on previous research and theories. Moreover, we tested an alternative model as a robustness check. These additional analyses showed that a strong identification environment buffers the stress caused by external stressors but does not help much if the person is already more anxious than others. It is clear that experimental and longitudinal research is needed to confirm this finding. Furthermore, our findings do not exclude the possibility that a strong identification environment could never lead to 'immature cohesiveness' and the black sheep effect in another design. Social identification is a multidimensional construct (Cameron, 2004; Leach et al., 2008; Tajfel, 1982) and our item reflected the ties to the group and not just the level of self-categorization (Cameron, 2004). Identification environment, which is based solely on self-categorization, leads more likely to the immature cohesiveness (Marmarosh & Sproul, 2021). Since the identification environment is a multidimensional phenomenon, using a single item is a limitation of our study. A task for future research will be to analyse identification environment with a more fine-grained measure (but see Jans et al., 2015). Finally, we used the same instrument (a survey) to measure our constructs. This may cause a common-method bias (Podsakoff et al., 2012). Although, this bias might have influenced the student level at some degree (H1), at the school level, it has only a minimal effect since cases in different directions cancel each other (H2). Furthermore, since it can be expected that the bias has an equal effect in each school, it has an effect on the average regression coefficient but has no effect on the random variation of slopes and thus not on cross-level interactions (H3a/H3b).

To conclude, using powerful data, we showed that a strong identification environment can buffer the stressor-strain relationship. This suggests that strongly identified groups have greater resources and will to provide reciprocal support and help to the in-group's members than weakly identified groups. However, since this research area is only beginning, much more research is needed to better understand the complex process and its consequences that arise at multiple levels.

AUTHOR CONTRIBUTIONS

Eerika Finell: Conceptualization; formal analysis; funding acquisition; methodology; visualization; writing – original draft; writing – review and editing. **Asko Tolvanen:** Formal analysis; methodology; writing – review and editing. **Ian Shuttleworth:** Writing – original draft; writing – review and editing. **Kevin Durrheim:** Writing – review and editing. **Maaret Vuorenmaa:** Investigation; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

We have no conflicts of interest to disclose.

DATA AVAILABILITY STATEMENT

The data are available from the Finnish Institute for Health and Welfare (THL) but were used under license for the current study and so are not publicly available. Data are available upon request with permission of the Finnish Institute for Health and Welfare (THL).

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REFERENCES

Agarwal, N., Meena, C. S., Raj, B. P., Saini, L., Kumar, A., Gopalakrishnan, N., Kumar, A., Balam, N. B., Alam, T., Kapoor, N. R., & Aggarwal, V. (2021). Indoor air quality improvement in COVID-19 pandemic: Review. *Sustainable Cities and Society*, *70*, 102942. https://doi.org/10.1016/j.scs.2021.102942

Aldridge, J. M., & McChesney, K. (2018). The relationships between school climate and adolescent mental health and well-being: A systematic literature review. *International Journal of Educational Research*, *88*, 121–145. https://doi.org/10.1016/j.ijer.2018.01.012

Alfes, K., Shantz, A. D., & Ritz, A. (2018). A multilevel examination of the relationship between role overload and employee subjective health: The buffering effect of support climates. *Human Resource Management*, *57*(2), 659–673. https://doi.org/10.1002/hrm.21859

Allen, M. S., Iliescu, D., & Greiff, S. (2022). Single item measures in psychological science: A call to action. *European Journal of Psychological Assessment*, *38*(1), 1–5. https://doi.org/10.1027/1015-5759/a000699

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Publishing. https://doi.org/10.1176/appi.books.9780890425596

Ancheta, A. J., Cunningham, P. B., Liu, J., Powell, J. S., Halliday, C. A., & Bruzzese, J.-M. (2023). Asthma is associated with bullying victimization in rural adolescents. *Journal of Asthma*, *1–9*, 1409–1417. https://doi.org/10.1080/02770903.2022.2151466

Asparouhov, T., & Muthén, B. O. (2006). Constructing covariates in multilevel regression. Mplus. Web Notes, 11. www.statmodel.com

Bastos, R. M. B. (2017). The surprising success of the Finnish educational system in a global scenario of commodified education. *Revista Brasileira de Educação*, *22*(70), 802–825. https://doi.org/10.1590/S1413-24782017227040

Baumeister, R. F., & Tice, D. M. (1990). Point-counterpoints: Anxiety and social exclusion. *Journal of Social and Clinical Psychology*, *9*(2), 165–195. https://doi.org/10.1521/jscp.1990.9.2.165

Beard, C., & Björgvinsson, T. (2014). Beyond generalized anxiety disorder: Psychometric properties of the GAD-7 in a heterogeneous psychiatric sample. *Journal of Anxiety Disorders*, *28*(6), 547–552. https://doi.org/10.1016/j.janxdis.2014.06.002

Beemer, C. J., Stearns-Yoder, K. A., Schuldt, S. J., Kinney, K. A., Lowry, C. A., Postolache, T. T., Brenner, L. A., & Hoisington, A. J. (2021). A brief review on the mental health for select elements of the built environment. *Indoor and Built Environment*, *30*(2), 152–165. https://doi.org/10.1177/1420326X19889653

Biswas, T., Scott, J. G., Munir, K., Renzaho, A. M. N., Rawal, L. B., Baxter, J., & Mamun, A. A. (2020). Global variation in the prevalence of suicidal ideation, anxiety and their correlates among adolescents: A population based study of 82 countries. *eClinicalMedicine*, *24*, 100395. https://doi.org/10.1016/j.eclinm.2020.100395

Bliese, P. D., & Jex, S. M. (1999). Incorporating multiple levels of analysis into occupational stress research. *Work and Stress*, *13*(1), 1–6. https://doi.org/10.1080/026783799296147

Braaten, L. J. (1991). Group cohesion: A new multidimensional model. *Group*, *15*, 39–55. http://www.jstor.org/stable/41719092

Branscombe, N. R., Wann, D. L., Noel, J. G., & Coleman, J. (1993). In-group or out-group extremity: Importance of the threatened social identity. *Personality and Social Psychology Bulletin*, *19*(4), 381–388. https://doi.org/10.1177/0146167293194003

Bronkhorst, B., Tummers, L., Steijn, B., & Vijverberg, D. (2015). Organizational climate and employee mental health outcomes: A systematic review of studies in health care organizations. *Health Care Management Review*, *40*(3), 254–271. https://doi.org/10.1097/HMR.0000000000000026

Cameron, J. E. (2004). A three-factor model of social identity. *Self and Identity*, *3*(3), 239–262. https://doi.org/10.1080/13576500444000047

Carleton, R. N. (2016). Into the unknown: A review and synthesis of contemporary models involving uncertainty. *Journal of Anxiety Disorders*, *39*, 30–43. https://doi.org/10.1016/j.janxdis.2016.02.007

Chang, M. X.-L., Jetten, J., Cruwys, T., & Haslam, C. (2017). Cultural identity and the expression of depression: A social identity perspective: Cultural identity and depression. *Journal of Community & Applied Social Psychology*, *27*(1), 16–34. https://doi.org/10.1002/casp.2291

Cline, R. J. W., Orom, H., Berry-Bobovski, L., Hernandez, T., Black, C. B., Schwartz, A. G., & Ruckdeschel, J. C. (2010). Community-level social support responses in a slow-motion technological disaster: The case of Libby, Montana. *American Journal of Community Psychology*, *46*(1–2), 1–18. https://doi.org/10.1007/s10464-010-9329-6

Cruwys, T., Haslam, S. A., Dingle, G. A., Haslam, C., & Jetten, J. (2014). Depression and social identity: An integrative review. *Personality and Social Psychology Review*, *18*(3), 215–238. https://doi.org/10.1177/1088868314523839

de Lijster, J. M., Dieleman, G. C., Utens, E. M. W. J., Dierckx, B., Wierenga, M., Verhulst, F. C., & Legerstee, J. S. (2018). Social and academic functioning in adolescents with anxiety disorders: A systematic review. *Journal of Affective Disorders*, *230*, 108–117. https://doi.org/10.1016/j.jad.2018.01.008

Diez-Roux, A. V. (1998). Bringing context back into epidemiology: Variables and fallacies in multilevel analysis. *American Journal of Public Health*, *88*(2), 216–222. https://doi.org/10.2105/AJPH.88.2.216

Drury, J., Brown, R., González, R., & Miranda, D. (2016). Emergent social identity and observing social support predict social support provided by survivors in a disaster: Solidarity in the 2010 Chile earthquake: Social identity and observed social support in an earthquake. *European Journal of Social Psychology*, *46*(2), 209–223. https://doi.org/10.1002/ejsp.2146

Drury, J., Carter, H., Cocking, C., Ntontis, E., Tekin Guven, S., & Amlôt, R. (2019). Facilitating collective psychosocial resilience in the public in emergencies: Twelve recommendations based on the social identity approach. *Frontiers in Public Health*, *7*, 1–21. https://doi.org/10.3389/fpubh.2019.00141

Edelstein, M. R. (2018). *Contaminated communities: Coping with residential toxic exposure* (2nd ed.). Routledge.

Eidelman, S., & Biernat, M. (2003). Derogating black sheep: Individual or group protection? *Journal of Experimental Social Psychology*, *39*(6), 602–609. https://doi.org/10.1016/S0022-1031(03)00042-8

Enders, C. (2010). *Applied missing analysis*. Guilford Press.

Enders, C., & Bandalos, D. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling: A Multidisciplinary Journal*, *8*(3), 430–457. https://doi.org/10.1207/S15328007SEM0803_5

Enders, C. K., & Tofighi, D. (2007). Centering predictor variables in cross-sectional multilevel models: A new look at an old issue. *Psychological Methods*, *12*(2), 121–138. https://doi.org/10.1037/1082-989X.12.2.121

Escartín, J., Ullrich, J., Zapf, D., Schlüter, E., & van Dick, R. (2013). Individual- and group-level effects of social identification on workplace bullying. *European Journal of Work and Organizational Psychology*, *22*(2), 182–193. https://doi.org/10.1080/1359432X.2011.647407

Esty, B., & Phipatanakul, W. (2018). School exposure and asthma. *Annals of Allergy, Asthma & Immunology*, *120*(5), 482–487. https://doi.org/10.1016/j.anai.2018.01.028

Finell, E. (2019). National identity, collective events, and meaning: A qualitative study of adolescents' autobiographical narratives of flag ceremonies in Finland: National identity, flag ceremony, and meaning. *Political Psychology*, *40*(1), 21–36. https://doi.org/10.1111/pops.12512

Finell, E., & Seppälä, T. (2018). Indoor air problems and experiences of injustice in the workplace: A quantitative and a qualitative study. *Indoor Air*, *28*(1), 125–134. https://doi.org/10.1111/ina.12409

Finell, E., Tolvanen, A., Pekkanen, J., Ståhl, T., & Luopa, P. (2021). Dampness and student-reported social climate: Two multilevel mediation models. *Environmental Health*, *20*(1), 30. https://doi.org/10.1186/s12940-021-00710-5

Fong, P., Cruwys, T., Haslam, C., & Haslam, S. A. (2019). Neighbourhood identification and mental health: How social identification moderates the relationship between socioeconomic disadvantage and health. *Journal of Environmental Psychology*, *61*, 101–114. https://doi.org/10.1016/j.jenvp.2018.12.006

Goldstone, R. L., & Byrge, L. A. (2013). *Perceptual learning*. Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199600472.013.029

Grupe, D. W., & Nitschke, J. B. (2013). Uncertainty and anticipation in anxiety: An integrated neurobiological and psychological perspective. *Nature Reviews Neuroscience*, *14*(7), 488–501. https://doi.org/10.1038/nrn3524

Haslam, C., Jetten, J., Cruwys, T., Dingle, G. A., & Haslam, S. A. (2018). *The new psychology of health: Unlocking the social cure* (1st ed.). Routledge. https://doi.org/10.4324/9781315648569

Haslam, S. A., Jetten, J., Postmes, T., & Haslam, C. (2009). Social identity, health and well-being: An emerging agenda for applied psychology. *Applied Psychology*, *58*(1), 1–23. https://doi.org/10.1111/j.1464-0597.2008.00379.x

Haslam, S. A., O'Brien, A., Jetten, J., Vormedal, K., & Penna, S. (2005). Taking the strain: Social identity, social support, and the experience of stress. *British Journal of Social Psychology*, *44*(3), 355–370. https://doi.org/10.1348/014466605X37468

Haslam, S. A., & Reicher, S. (2006). Stressing the group: Social identity and the unfolding dynamics of responses to stress. *Journal of Applied Psychology*, *91*(5), 1037–1052. https://doi.org/10.1037/0021-9010.91.5.1037

Haslam, S. A., Reicher, S. D., & Reynolds, K. J. (2012). Identity, influence, and change: Rediscovering John Turner's vision for social psychology: Rediscovering John Turner. *British Journal of Social Psychology*, *51*(2), 201–218. https://doi.org/10.1111/j.2044-8309.2011.02091.x

Häusser, J. A., Junker, N. M., & Dick, R. (2020). The *how* and the *when* of the social cure: A conceptual model of group- and individual-level mechanisms linking social identity to health and well-being. *European Journal of Social Psychology*, *50*(4), 721–732. https://doi.org/10.1002/ejsp.2668

Hayes, A. F., & Coutts, J. J. (2020). Use omega rather than Cronbach's alpha for estimating reliability. But…. *Communication Methods and Measures*, *14*(1), 1–24. https://doi.org/10.1080/19312458.2020.1718629

Hefner, J., & Eisenberg, D. (2009). Social support and mental health among college students. *American Journal of Orthopsychiatry*, *79*(4), 491–499. https://doi.org/10.1037/a0016918

Herr, R. M., Bosch, J. A., Loerbroks, A., Genser, B., Almer, C., van Vianen, A. E. M., & Fischer, J. E. (2018). Organizational justice, justice climate, and somatic complaints: A multilevel investigation. *Journal of Psychosomatic Research*, *111*, 15–21. https://doi.org/10.1016/j.jpsychores.2018.05.003

Hill, R. M., Castellanos, D., & Pettit, J. W. (2011). Suicide-related behaviors and anxiety in children and adolescents: A review. *Clinical Psychology Review*, *31*(7), 1133–1144. https://doi.org/10.1016/j.cpr.2011.07.008

Hogg, M. A. (1993). Group cohesiveness: A critical review and some new rirections. *European Review of Social Psychology*, *4*(1), 85–111. https://doi.org/10.1080/14792779343000031

Hogg, M. A. (2001). Social categorization, depersonalization, and group behavior. In M. A. Hogg & R. S. Tindale (Eds.), *Blackwell handbook of social psychology: Group processes* (pp. 56–85). Blackwell.

Hoisington, A. J., Stearns-Yoder, K. A., Schuldt, S. J., Beemer, C. J., Maestre, J. P., Kinney, K. A., Postolache, T. T., Lowry, C. A., & Brenner, L. A. (2019). Ten questions concerning the built environment and mental health. *Building and Environment*, *155*, 58–69. https://doi.org/10.1016/j.buildenv.2019.03.036

Hollarek, M., & Lee, N. C. (2022). Current understanding of developmental changes in adolescent perspective taking. *Current Opinion in Psychology*, *45*, 101308. https://doi.org/10.1016/j.copsyc.2022.101308

Hox, J. J. (2010). *Multilevel analysis. Techniques and applications* (2nd ed.). Routledge.

Hox, J. J., Maas, C. J. M., & Brinkhuis, M. J. S. (2010). The effect of estimation method and sample size in multilevel structural equation modeling. *Statistica Neerlandica*, *64*(2), 157–170. https://doi.org/10.1111/j.1467-9574.2009.00445.x

James, L. R., & Jones, A. P. (1974). Organizational climate: A review of theory and research. *Psychological Bulletin*, *81*(12), 1096–1112. https://doi.org/10.1037/h0037511

Jans, L., Leach, C. W., Garcia, R. L., & Postmes, T. (2015). The development of group influence on in-group identification: A multilevel approach. *Group Processes & Intergroup Relations*, *18*(2), 190–209. https://doi.org/10.1177/1368430214540757

Jetten, J., Haslam, C., & Haslam, S. A. (Eds.). (2012). *The social cure,identity, health and well-being*. Psychology Press.

Jetten, J., Haslam, S. A., Cruwys, T., Greenaway, K. H., Haslam, C., & Steffens, N. K. (2017). Advancing the social identity approach to health and well-being: Progressing the social cure research agenda: Applying the social cure. *European Journal of Social Psychology*, *47*(7), 789–802. https://doi.org/10.1002/ejsp.2333

Junker, N. M., van Dick, R., Häusser, J. A., Ellwart, T., & Zyphur, M. J. (2022). The I and we of team identification: A multilevel study of exhaustion and (in)congruence among individuals and teams in team identification. *Group & Organization Management*, *47*, 41–71. https://doi.org/10.1177/10596011211004789

Khan, S. S., Hopkins, N., Reicher, S., Tewari, S., Srinivasan, N., & Stevenson, C. (2015). Shared identity predicts enhanced health at a mass gathering. *Group Processes & Intergroup Relations*, *18*(4), 504–522. https://doi.org/10.1177/1368430214556703

Kingery, J. N., Erdley, C. A., Marshall, K. C., Whitaker, K. G., & Reuter, T. R. (2010). Peer experiences of anxious and socially withdrawn youth: An integrative review of the developmental and clinical literature. *Clinical Child and Family Psychology Review*, *13*, 91–128. https://doi.org/10.1007/s10567-009-0063-2

Ku, G., Wang, C. S., & Galinsky, A. D. (2015). The promise and perversity of perspective-taking in organizations. *Research in Organizational Behavior*, *35*, 79–102. https://doi.org/10.1016/j.riob.2015.07.003

Lai, M. H. C., & Kwok, O. (2015). Examining the rule of thumb of not using multilevel modeling: The "design effect smaller than two" rule. *The Journal of Experimental Education*, *83*(3), 423–438. https://doi.org/10.1080/00220973.2014.907229

Leach, C. W., van Zomeren, M., Zebel, S., Vliek, M. L. W., Pennekamp, S. F., Doosje, B., Ouwerkerk, J. W., & Spears, R. (2008). Group-level self-definition and self-investment: A hierarchical (multicomponent) model of in-group identification. *Journal of Personality and Social Psychology*, *95*(1), 144–165. https://doi.org/10.1037/0022-3514.95.1.144

Lee, E., Reynolds, K. J., Subasic, E., Bromhead, D., Lin, H., Marinov, V., & Smithson, M. (2017). Development of a dual school climate and school identification measure–student (SCASIM-St). *Contemporary Educational Psychology*, *49*, 91–106. https://doi.org/10.1016/j.cedpsych.2017.01.003

Lorah, J. (2018). Effect size measures for multilevel models: Definition, interpretation, and TIMSS example. *Large-scale Assessments in Education*, *6*(1), 2238–2255. https://doi.org/10.1186/s40536-018-0061-2

Maas, C., & Hox, J. J. (2005). Sufficient sample sizes for multilevel modeling. *Methodology*, *1*(3), 86–92. https://doi.org/10.1027/1614-1881.1.3.86

Marmarosh, C. L., & Sproul, A. (2021). Group cohesion: Empirical evidence from group psychotherapy for those studying other areas of group work. In C. D. Parks & G. A. Tasca (Eds.), *The psychology of groups: The intersection of social psychology and psychotherapy research* (pp. 169–189). American Psychological Association. https://doi.org/10.1037/0000201-010

Marques, J., Abrams, D., & Serôdio, R. G. (2001). Being better by being right: Subjective group dynamics and derogation of in-group deviants when generic norms are undermined. *Journal of Personality and Social Psychology*, *81*(3), 436–447. https://doi.org/10.1037/0022-3514.81.3.436

Marques, J. M., & Yzerbyt, V. Y. (1988). The black sheep effect: Judgmental extremity towards in-group members in inter- and intra-group situations. *European Journal of Social Psychology*, *18*(3), 287–292. https://doi.org/10.1002/ejsp.2420180308

Matthews, R. A., Pineault, L., & Hong, Y.-H. (2022). Normalizing the use of single-item measures: Validation of the single-item compendium for organizational psychology. *Journal of Business and Psychology*, *37*(4), 639–673. https://doi.org/10.1007/s10869-022-09813-3

McNeill, K. G., Kerr, A., & Mavor, K. I. (2014). Identity and norms: The role of group membership in medical student wellbeing. *Perspectives on Medical Education*, *3*(2), 101–112. https://doi.org/10.1007/S40037-013-0102-Z

McNeish, D. (2018). Thanks coefficient alpha, we'll take it from here. *Psychological Methods*, *23*, 412–433. https://doi.org/10.1037/met0000144

Modin, B., & Östberg, V. (2009). School climate and psychosomatic health: A multilevel analysis. *School Effectiveness and School Improvement*, *20*(4), 4–455.

Muthén, B. O. (1998). *Mplus technical appendices*. Muthén & Muthén.

Muthén, B. O., & Satorra, A. (1995). Complex sample data in structural equation modeling. *Sociological Methodology*, *25*, 267. https://doi.org/10.2307/271070

Muthén, L. K., & Muthén, B. O. (1998). *Mplus user's guide* (7th ed.). Muthén & Muthén.

Neville, F., & Reicher, S. (2011). The experience of collective participation: Shared identity, relatedness and emotionality. *Contemporary Social Science*, *6*(3), 377–396. https://doi.org/10.1080/21582041.2012.627277

Neville, F. G., Novelli, D., Drury, J., & Reicher, S. D. (2020). Shared social identity transforms social relations in imaginary crowds. *Group Processes & Intergroup Relations*, *25*, 158–173. https://doi.org/10.1177/1368430220936759

Ntontis, E., Drury, J., Amlôt, R., Rubin, G. J., & Williams, R. (2018). Emergent social identities in a flood: Implications for community psychosocial resilience. *Journal of Community & Applied Social Psychology*, *28*(1), 3–14. https://doi.org/10.1002/casp.2329

Onorato, R. S., & Turner, J. C. (2004). Fluidity in the self-concept: The shift from personal to social identity. *European Journal of Social Psychology*, *34*(3), 257–278. https://doi.org/10.1002/ejsp.195

Ozeki, M. (2015). Group-level group identity as a basis of a group. *Group Dynamics: Theory, Research, and Practice*, *19*(3), 166–180. https://doi.org/10.1037/gdn0000030

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, *63*(1), 539–569. https://doi.org/10.1146/annurev-psych-120710-100452

Polanczyk, G. V., Salum, G. A., Sugaya, L. S., Caye, A., & Rohde, L. A. (2015). Annual research review: A meta-analysis of the worldwide prevalence of mental disorders in children and adolescents. *Journal of Child Psychology and Psychiatry*, *56*(3), 345–365. https://doi.org/10.1111/jcpp.12381

Portoghese, I., Galletta, M., Burdorf, A., Cocco, P., D'Aloja, E., & Campagna, M. (2017). Role stress and emotional exhaustion among health care workers: The buffering effect of supportive coworker climate in a multilevel perspective. *Journal of Occupational and Environmental Medicine*, *59*(10), e187–e193. https://doi.org/10.1097/JOM.0000000000001122

Postmes, T., Haslam, S. A., & Jans, L. (2013). A single-item measure of social identification: Reliability, validity, and utility. *British Journal of Social Psychology*, *52*(4), 597–617. https://doi.org/10.1111/bjso.12006

Postmes, T., Wichmann, L. J., van Valkengoed, A. M., & van der Hoef, H. (2019). Social identification and depression: A meta-analysis. *European Journal of Social Psychology*, *49*(1), 110–126. https://doi.org/10.1002/ejsp.2508

Prati, G., Cicognani, E., & Albanesi, C. (2018). The influence of school sense of community on students' well-being: A multilevel analysis. *Journal of Community Psychology*, *46*(7), 917–924. https://doi.org/10.1002/jcop.21982

Racine, N., McArthur, B. A., Cooke, J. E., Eirich, R., Zhu, J., & Madigan, S. (2021). Global prevalence of depressive and anxiety symptoms in children and adolescents during covid-19: A meta-analysis. *JAMA Pediatrics*, *175*(11), 1142–1150. https://doi.org/10.1001/jamapediatrics.2021.2482

Reicher, S. (2017). "La beauté est dans la rue": Four reasons (or perhaps five) to study crowds. *Group Processes & Intergroup Relations*, *20*(5), 593–605. https://doi.org/10.1177/1368430217712835

Reicher, S., & Haslam, S. A. (2006). Rethinking the psychology of tyranny: The BBC prison study. *British Journal of Social Psychology*, *45*(1), 1–40. https://doi.org/10.1348/014466605X48998

Reicher, S., & Hopkins, N. (2001). *Self and nation*. Sage.

Reynolds, K. J., Subasic, E., Lee, E., & Bromhead, D. (2017). School climate, social identity processes and school outcomes (eBook). In K. I. Mavor, M. J. Platow, & B. Bizumic (Eds.), *Self and social identity in educational context*. Routledge.

Rubin, D. B. (1976). Inference and missing data. *Biometrika*, *63*(3), 581–592. https://doi.org/10.2307/2335739

Schneider, B., Ehrhart, M. G., & Macey, W. H. (2013). Organizational climate and culture. *Annual Review of Psychology*, *64*(1), 361–388. https://doi.org/10.1146/annurev-psych-113011-143809

Seppälä, T., Riikonen, R., Paajanen, P., Stevenson, C., & Finell, E. (2022). Development of first-time mothers' sense of shared identity and integration with other mothers in their neighbourhood. *Journal of Community & Applied Social Psychology*, *32*, 692–705. https://doi.org/10.1002/casp.2592

Snijders, T. A. B., & Bosker, R. J. (2012). *Multilevel analysis. An introduction to basic and advanced multilevel modeling* (2nd ed.). Sage.

Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, *166*(10), 1092. https://doi.org/10.1001/archinte.166.10.1092

Steffens, N. K., Haslam, S. A., Schuh, S. C., Jetten, J., & van Dick, R. (2017). A meta-analytic review of social identification and health in organizational contexts. *Personality and Social Psychology Review*, *21*(4), 303–335. https://doi.org/10.1177/1088868316656701

Stevenson, C., & Sagherian-Dickey, T. (2016). Collectively coping with contact: The role of intragroup support in dealing with the challenges of intergroup mixing in residential contexts. *British Journal of Social Psychology*, *55*(4), 681–699. https://doi.org/10.1111/bjso.12150

Stewart, T., & Suldo, S. (2011). Relationships between social support sources and early adolescents' mental health: The moderating effect of student achievement level: Social support and adolescent mental health. *Psychology in the Schools*, *48*(10), 1016–1033. https://doi.org/10.1002/pits.20607

Tajfel, H. (1982). Social psychology of intergroup relations. *Annual Review of Psychology*, *33*(1), 1–39. https://doi.org/10.1146/annurev.ps.33.020182.000245

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Brooks Cole.

Thaning, M., & Hällsten, M. (2020). The end of dominance? Evaluating measures of socio-economic background in stratification research. *European Sociological Review*, *36*(4), 533–547. https://doi.org/10.1093/esr/jcaa009

Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of Educational Research*, *83*(3), 357–385. https://doi.org/10.3102/0034654313483907

Thomas, W. E., Brown, R., Easterbrook, M. J., Vignoles, V. L., Manzi, C., D'Angelo, C., & Holt, J. J. (2019). Team-level identification predicts perceived and actual team performance: Longitudinal multilevel analyses with sports teams. *British Journal of Social Psychology*, *58*(2), 473–492. https://doi.org/10.1111/bjso.12277

Tong, L., Reynolds, K., Lee, E., & Liu, Y. (2019). School relational climate, social identity, and student well-being: New evidence from China on student depression and stress levels. *School Mental Health*, *11*(3), 509–521. https://doi.org/10.1007/s12310-018-9293-0

Torsheim, T., & Wold, B. (2001). School-related stress, support, and subjective health complaints among early adolescents: A multilevel approach. *Journal of Adolescence*, *24*(6), 701–713. https://doi.org/10.1006/jado.2001.0440

Tucker, M. K., Jimmieson, N. L., & Oei, T. P. (2013). The relevance of shared experiences: A multi-level study of collective efficacy as a moderator of job control in the stressor-strain relationship. *Work and Stress*, *27*(1), 1–21. https://doi.org/10.1080/02678373.2013.772356

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. Blackwell.

Wang, X.-H. (F.), & Howell, J. M. (2012). A multilevel study of transformational leadership, identification, and follower outcomes. *The Leadership Quarterly*, *23*(5), 775–790. https://doi.org/10.1016/j.leaqua.2012.02.001

Witt, J. K. (2011). Action's effect on perception. *Current Directions in Psychological Science*, *20*(3), 201–206. https://doi.org/10.1177/0963721411408770

Zullig, K. J., Koopman, T. M., Patton, J. M., & Ubbes, V. A. (2010). School climate: Historical review, instrument development, and school assessment. *Journal of Psychoeducational Assessment*, *28*(2), 139–152. https://doi.org/10.1177/0734282909344205

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