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**Original article**

# The relationship of schools to emotional health and bullying

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**Abstract**

**Objectives:** To examine the extent to which school climate and school pressure could predict other aspects of adolescents' lives, most particularly their emotional health and bullying. Furthermore, the study sought to investigate if these relationships were consistent across countries.

**Methods:** Participants were 11-, 13-, and 15-year-olds from 26 European countries/regions, Canada, the United States, and Israel. Participants completed surveys focusing on health behaviours and lifestyles, using a contextual framework. Using cluster analytic techniques, three clusters were created varying on school pressure and perceived school climate. These clusters were then examined using variables not used in the clustering.

**Results:** Students in the cluster having the most positive relationships to school outcomes, including academic achievement, truancy, teacher and peer support, also had the most positive emotional health and the lowest incidence of bullying. Similarly, those in the poorest cluster in terms of school also had the poorest outcomes in terms of emotional health and bullying.

**Conclusions:** These relatively small but significant associations suggest that schools may have a small role in supporting children's emotional well-being and ameliorate the presence of bullying.

**Keywords: School climate – School pressure – Emotional health – Psychosomatic symptoms – Cluster analysis.**

## Introduction

Emotional health, like mental health in general[1], can be seen as "a complete state in which individuals are free of psychopathology and flourishing" (p. 539), containing both absence of negative symptomatology and presence of positive features. Low levels of good emotional health represent a major problem internationally. According to the World Health Organization[2], at any point in time, there are an estimated 450 million people in the world who are afflicted by some sort of mental, neurological, or behavioural problem. These problems often begin in adolescence and persist through to adulthood[3–5]. Similarly, strong connections between emotional health and bullying (whether as a victim or as a bully) have been found across several countries[6–10].

Early adolescence is a particularly vulnerable time for the onset of mental health problems and the occurrence of bullying[11]. At this time, young people are undergoing many psychological and biological changes associated with puberty[12]. In addition, they generally have to cope with a change in school environment from elementary to middle school or junior high school and then to high school[13–14], a school environmental change that varies by country. Thus schools are an important arena for the study of adolescents' emotional health[15] and bullying[16].

School climate in general (with its admittedly varied definitions across research studies) and school pressure in particular have generally been found to be predictive of negative emotional health[13,17,18]. Furthermore, school support, whether from teachers[17,12,19] or peers[19–21], may be predictive of decreased risk of poor emotional health and of decreased

involvement in bullying[7,22–24]. Bullying may also have long-term consequences for children. "[C]hildren [who] exhibit bullying behavior at an elementary school age turn to more serious forms of harassment, dating abuse, and sexual abuse at high school age, and ultimately, to serious acts of violence as adults"[25]. In addition, children who are bullies or who are both bullies and victims may be at greater risk for depression as young adults[26].

While previous studies of the relationship among emotional health, bullying, and school suggest that school experiences might be related to emotional health and bullying, these results have been obtained in single country samples involving pairs of these constructs. However, the relationships between school and emotional health outcomes seem to vary across country[27]. Further, emotional health is an important area of cross-national concern. Therefore, the purpose of the present study was to examine the relationships of perceived school climate and school pressure to emotional health and bullying cross-nationally. The work was largely exploratory, enabling us to begin to examine possible student similarities and cross-national patterns associated with schooling and health outcomes. Two research questions framed the study:

1) How do students clustered by school climate and school pressure compare with respect to academic achievement, truancy, school support, emotional health, and bullying?
2) To what extent are cross-national differences in cluster membership reflected in the relationship between cluster membership and other variables?

These questions were answered using data obtained from the 1997/98 administration of the Health Behavior in School-aged Children (HBSC) survey administered in 29 countries/regions (Belgium being divided into two regions; Wales, England, and Scotland being considered separately). We used the 1997/98 survey as it had more comprehensive coverage of school variables than previous (e. g., 1993/94) or subsequent (e. g., 2001/02; 2005/06) surveys.

## Methods

Over 120,000 students aged 11, 13, and 15 from 26 European countries, Canada, the United States and Israel took part in the 1997/98 HBSC survey used for this study[28]. An international standardized research protocol was designed to ensure consistency in the survey instrument, sampling and data collection. Nationally/regionally representative samples of approximately 1,500 students at each age group were drawn, and participants were selected using cluster sampling with school or school class as the sampling unit. Nonetheless, variations in the schools systems did result in some variability in the manner in which students within schools were sampled. This variability makes it more difficult to combine cross-national analyses with multi-level modeling techniques. The survey consisted of mandatory items (used by all countries) and optional items (chosen by individual countries). The overall goal of the survey was to gain insight into the health behaviours and lifestyles of young people, using a contextual framework[29].

*Measures*

Clustering variables. Two scales were created from the HBSC items to cluster the cases. These scales were established through an examination of the factor structure of the school items and in line with the theoretical foundation upon which the work was based. The factors were created using principal axis factoring with varimax rotation, using the entire sample of students to best determine the factor structure. Prior to our analyses, all of the scales were recoded to be on a 5-point scale and items were recoded such that low and high scores had a similar meaning. Scales were created using the summed score of the items in the scale, replacing missing values with the imputed mean based on the other items in the scale for each child. The school climate scale (with scores ranging from 6 to 30) was derived from six items, including "Our school is a nice place to be" and "I feel I belong at this school." The internal consistency (Cronbach's $\alpha$) for this scale varied from 0.53 to 0.78 across the countries with the median being 0.73. The school pressure scale (with scores ranging from 4 to 20) consisted of four items. A sample item for this scale was "My parents expect too much of me at school." The internal consistency for this scale was lower, ranging from a low of 0.23 to 0.68 with the median being 0.54. A likely reason for the lower consistency in this scale is the variability in which students from different countries responded to questions about excess pressure from parents and teachers.

Non-clustering school items. Two types of school items were measured but not used for clustering: school adjustment and school support. Two aspects of school adjustment – academic achievement and truancy – were each measured with a single item. The question for academic achievement was "In your opinion, what does your class teacher(s) think about your school performance compared to your classmates?" with four possible responses "below average," "average," "good," and "very good." The truancy item asked: "How many days did you skip classes or school this term?" with responses ranging from "1" = "0 days" to "5" = "4 or more days." These items were included in that school adjustment remains a priority for educators. In addition to the two single items, there were scales created to measure two types of school support. The peer support scale consisted of three items and had an overall

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internal consistency of 0.69 (range: 0.54 to 0.77). The teacher support scale consisted of four items and had an internal consistency of 0.73 (range: 0.54–0.80).

Outcome variables. Two scales were generated to measure emotional health. The first scale, "emotional well-being," consisted of five items with an internal consistency median of 0.69. Across countries the internal consistency ranged from 0.33 to 0.77. Higher scores on this scale represented better emotional health. An example of an emotional well-being item was "In general, how do you feel about your life at present?" The second scale, "psychosomatic symptoms," was derived from eight items (median $\alpha = 0.77$, ranging from 0.73 to 0.83). In this case, higher scores were associated with poorer outcomes.

In addition, there were two items measuring bullying behaviours. Both items asked how often the student had engaged in bullying during the school term, one item as a victim and one item as a perpetrator. The items were scored from "1" being "never" to "5" being "several times a week." These items have been developed and validated by Olweus across a series of studies[30].

*Analyses*

There were three steps in our data analyses. First, students were assigned to clusters in the first step. Cluster analysis is an exploratory classification technique that reveals underlying structures inherent within a dataset[31]. The two-step cluster procedure in the Statistical Package for the Social Sciences (SPSS, version 17.0) was used to determine the appropriate number of clusters, using perceived school climate and school pressure as clustering variables. Since we were interested in determining if our results could be used to identify cross-national patterns, we completed the cluster analyses considering the sample of students as a whole. The ratio of distance measures peaked for both 3 and 5 clusters, at 1.90 for 3 clusters and 1.73 for 5 clusters. All other cluster formations had distance measures ratios below 1.31.

The K-means cluster analysis procedure was then used, comparing both the 3- and 5-cluster solution. Given that only two factors were used for the clustering, and the unbalanced cluster membership of the 5-cluster solution, the 3-cluster solution was considered slightly superior and used in our subsequent analyses. Cases were assigned to one of these three clusters from the K-means clustering procedure. Next, the clusters were statistically compared on the variables of interest. Analysis of Variance (ANOVA) was followed by post hoc analysis using Tukey's Least Squares Difference (LSD). Finally, the percentage frequency of cluster membership was determined for each country and compared to the frequencies for other countries.

## Results

The results are organized by research question (a descriptive table is available from the first author). First, we explore cluster membership and its effects for the total population. Then we examine the differential cluster membership across countries.

How do students clustered by school climate and school pressure compare with respect to academic achievement, truancy, school support, emotional health, and bullying?

There were three clusters derived from the total sample. Based on their average scores on the school pressure and school climate scales, we named Cluster 1, the "medium climate, low pressure" group, Cluster 2, the "high climate, high pressure" group, and Cluster 3, the "the low climate, high pressure" group. The separation of the average scores were small in some cases, for example, only 0.06 separated the school pressure average scores for Clusters 2 and 3. In other cases, the average scores were more different. As an example, the average school pressure score for Cluster 1 was 8.58 as compared to 13.21 for Cluster 2 and 13.15 for Cluster 3 (see Table 1). Based on these average scores and their variability, students generally reported relatively positive perceptions about school climate. School pressure was more different across the clusters. Hence our use of the terms, high, medium, and low situate the three groups descriptively rather than analytically. Nevertheless, children in Cluster 1 reported significantly lower levels of school pressure than the other two clusters. Similarly, the perceived school climate for Cluster 1 was significantly higher than in Cluster 3 and significantly lower than in Cluster 2 (see Table 1). Cluster 2 had the highest perceived school climate mean score (24.30) and the highest school pressure mean score (13.21). Cluster 3 had the lowest climate of all three groups (21.24) and the middle level of pressure (13.15).

Cluster membership had significant relationships to all of the school outcomes that were not used to cluster the cases initially with small to medium effect sizes ($\eta^2$ ranging from 0.03 to 0.18). Teacher support accounted for 18 % of the variability in cluster membership, while truancy only accounted for 3 %. Cluster 3 ("low climate, high pressure") students reported the most negative experiences of school, when compared to the other two clusters. These students reported significantly lower academic achievement and reported higher levels of truancy. In addition, their self-reported school support, regardless of source, was lower than the other two clusters (see Table 1). Differences between Clusters 1 and 2 tended to be minimal, although significant, and there were some variations as to which cluster had the better schooling outcomes.

Cluster membership also had significant albeit small ($\eta^2$ rang-

**Table 1.** Cluster means for school variables.

| | 1. Med. Climate Low Pressure (n=47019) | 2. High Climate High Pressure (n=37662) | 3. Low Climate High Pressure (n=40684) |
|---|---|---|---|
| **Clustering Variables** | | | |
| Perceived School Climate | 23.18 $_b$ (2.69) | 24.30 $_a$ (2.45) | 21.24 $_c$ (3.11) |
| School Pressure | 8.58 $_a$ (1.82) | 13.21 $_c$ (1.98) | 13.15 $_b$ (2.72) |
| **Non-clustering School Variables** | | | |
| Academic Achievement | 2.86 $_a$ (.74) | 2.76 $_b$ (.77) | 2.48 $_c$ (.80) |
| Truancy | 1.53 $_a$ (1.06) | 1.63 $_b$ (1.18) | 2.02 $_c$ (1.45) |
| Peer Support | 3.91 $_b$ (.79) | 3.96 $_a$ (.81) | 3.46 $_c$ (.91) |
| Teacher Support | 3.72 $_b$ (.72) | 3.75 $_a$ (.78) | 3.02 $_c$ (.84) |

Note: High numbers represent positive outcomes for perceived school climate, academic achievement, and support. High numbers represent negative outcomes for school pressure and truancy. Within rows, values with different subscripts are significantly different at the .001 level. The subscript "a" represents the best outcome and the subscript "c" the poorest outcome. Eta-squared ($\eta^2$) values, representing effect sizes, are as follows: perceived school climate (0.62); school pressure (0.51); academic achievement (0.04); truancy (0.03); peer support (0.08); teacher support (0.18).

**Table 2.** Cluster means for outcome variables.

| | 1.Medium Clim. Low Pressure (n=47019) | 2. High Climate High Pressure (n=37662) | 3. Low Climate High Pressure (n=40684) |
|---|---|---|---|
| **Emotional Health** | | | |
| Emotional Well-Being | 20.27 $_a$ (2.99) | 19.46 $_b$ (3.38) | 18.27 $_c$ (3.81) |
| Psychosomatic Symptoms | 14.69 $_a$ (5.25) | 16.39 $_b$ (6.11) | 18.09 $_c$ (6.53) |
| **Bullying** | | | |
| Been bullied | 1.54 $_a$ (.92) | 1.65 $_b$ (1.00) | 1.82 $_c$ (1.15) |
| Have bullied | 1.49 $_a$ (.82) | 1.59 $_b$ (.92) | 1.82 $_c$ (1.08) |

Note: High numbers represent positive outcomes for emotional well-being and negative outcomes for the other variables. Within rows, values with different subscripts are significantly different at the .001 level. The subscript "a" represents the best outcome and the subscript "c" the poorest outcome. Eta-squared ($\eta^2$) values, representing effect sizes, are as follows: emotional well-being (0.01); psychosomatic symptoms (0.05); been bullied (0.01); have bullied (0.02).

ing from 0.01 to 0.05) associations to outcome variables with the pattern identical for all variables (see Table 2). Psychosomatic symptoms accounted for 5 % of the variability in cluster membership, while emotional well-being and having been bullied only accounted for 1 %. Cluster 1 students reported the most positive outcomes, Cluster 2 students reported intermediate outcomes, and Cluster 3 students reported the poorest outcomes. The differences between Clusters 1 and 2 were more pronounced on these outcomes than on the school variables. Thus students in Cluster 1 indicated slightly better emotional health in terms of increased emotional well-being and fewer psychosomatic symptoms. They also reported somewhat fewer incidents of bullying, either as victims or as perpetrators. Conversely, Cluster 3 students tended to report slightly lower levels of emotional well-being, more psychosomatic symptoms, and higher participation in bullying.

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**Table 3.** Cluster membership by country.

| | 1.Medium Clim. Low Pressure (n=47019) | 2. High Climate High Pressure (n=37662) | 3. Low Climate High Pressure (n=40684) |
|---|---|---|---|
| Austria | **52.9** | *17.9* | 29.2 |
| Belgium-Flemish | 30.0 | 23.2 | **46.8** |
| Belgium-French | 31.0 | 37.2 | 31.7 |
| Canada | 39.4 | 29.2 | 31.5 |
| Czech Republic | 32.7 | *20.8* | **46.5** |
| Denmark | **46.9** | *19.5* | 33.6 |
| England | 34.5 | 31.5 | 34.0 |
| Estonia | 37.7 | 34.1 | 28.2 |
| Finland | 46.3 | *18.0* | 35.7 |
| France | 39.8 | 27.1 | 33.1 |
| Germany | **49.5** | 31.2 | *19.4* |
| Greece | *12.6* | **58.2** | 29.2 |
| Greenland | 29.9 | 33.9 | 36.2 |
| Hungary | 43.6 | 26.7 | 29.7 |
| Israel | *21.2* | **44.1** | 34.7 |
| Latvia | 35.2 | **40.1** | 24.7 |
| Lithuania | *22.5* | **47.4** | 30.1 |
| Northern Ireland | 38.7 | 27.5 | 33.8 |
| Norway | 46.1 | 30.0 | *23.9* |
| Poland | 41.7 | 28.7 | *23.8* |
| Portugal | *26.7* | **49.5** | *23.8* |
| Rep. of Ireland | 41.9 | 26.6 | 31.5 |
| Russia | 30.3 | 28.0 | **41.7** |
| Scotland | 42.5 | 25.5 | 32.0 |
| Slovak Republic | *26.3* | 36.7 | 37.1 |
| Sweden | **50.8** | 25.4 | *23.8* |
| Switzerland | **58.1** | *20.0* | *21.9* |
| USA | 29.0 | 22.4 | **48.6** |
| Wales | 34.4 | 26.8 | **38.8** |
| Total | 37.5 | 30.0 | 32.5 |

Note: Bolded figures indicate that the country's percentage in that cluster is among the five highest. Italicized figures indicate that the country's percentage in that cluster is among the five lowest.

To what extent are cross-national differences in cluster membership reflected in the relationship between cluster membership and other variables*?*

Table 3 indicates the percentage of the sample of students by country that was classified into each cluster. The five countries with the greatest proportion of students in Cluster 1 ("medium climate, low pressure") included all three German-speaking countries in the survey (Austria, Germany, and Switzerland) and two of the four Nordic countries (Sweden and Denmark). The remaining two Nordic countries (Finland and Norway) had the sixth and seventh highest percentages of students in Cluster 1. Not surprisingly, high proportions of students in Cluster 1 were associated with low proportions in Cluster 2 and 3. As an example, Switzerland, the highest of all countries with 58.1 % of its students in Cluster 1, was among the lowest five in both clusters 2 and 3.

The five countries with the greatest proportion of students in Cluster 2 ("high climate, high pressure") included all three Mediterranean countries in the survey (Greece, Israel, and Portugal) and two of the three Baltic countries (Latvia and Lithuania). The other Baltic country, Estonia, was eighth highest in terms of the percentage of students in Cluster 2. In contrast, all three Mediterranean countries and Lithuania were among the five lowest in Cluster 1. In addition, Portugal was among the five lowest countries in Cluster 3. We could not find commonality amongst those countries with the highest proportion of students in Cluster 3 ("low climate, high pressure"). The United States had the highest percentage of students in Cluster 3 with 48.6 %, followed by Belgium-French, Czech Republic, Russia, and Wales. Only the Czech Republic was among the five lowest in any other cluster (in its case, Cluster 2).

Finally, we examined each country's pattern on the clustering and non-clustering factors and variables in relation to the general pattern found for the total sample (complete tables are available from the first author). No country's pattern in perceived school climate differed from the general pattern. However, in 10 countries (Belgium-Flemish, Belgium-French, Canada, England, Estonia, Finland, Germany, Greece, Republic of Ireland, Scotland), Cluster 3 students had higher school pressure than Cluster 2 students, and, in a further five countries (Hungary, Poland, Slovak Republic, Sweden, Wales), the difference between Clusters 2 and 3 was not significant.

In all countries, Cluster 1 and Cluster 2 students had significantly higher academic achievement and lower levels of truancy than Cluster 3 students. In 20 countries, Cluster 1 students reported higher academic achievement than Cluster 2 students, while, for two countries, Greece and Denmark, the relative positions of Clusters 1 and 2 were reversed. For truancy, Greece and Israel had more positive results for Cluster 2 students than Cluster 1 students, contrary to the overall pattern. Regardless of the relative positions of Clusters 1 and 2, Cluster 3 students were lowest in all types of support. Countries where Cluster 2 membership showed more positive results tended to be those with higher percentages of students in Cluster 2, most particularly the five countries with the highest percentages (i.e., Greece, Israel, Latvia, Lithuania, and Portugal). Greenland and Russia also tended to have more positive support outcomes for Cluster 2 students.

The country comparisons are fairly uncomplicated for emotional health and bullying with few anomalies. Overall, the country pattern is identical to the total sample pattern in 22 countries for emotional health, 26 countries for psychosomatic symptoms, 19 countries for been bullied, and 25 countries for have bullied. Greece does not follow the overall pattern exactly for the four outcome variables, in that Clusters 1 and 2 are not significantly different. Lithuania and the Slovak Republic also show limited differences between these two clusters.

## Discussion

Our exploratory analyses were designed to determine if there were any significant associations with educational and health outcomes and if there were any cross-national patterns that could be ascertained from our findings. Our findings not only support previous research findings but also identify areas worthy of further investigation. Not surprisingly, students who reported a more positive school climate, whether accompanied by high or low levels of school pressure, were more likely to report better academic achievement and lower incidences of truancy. Of more interest, perceptions of a more positive school climate did not seem to alter the negative relationships between high school pressure and other variables, such as emotional health and bullying. These relationships seemed to be largely consistent across countries, even though the proportions of students in different clusters varied across countries.

A further finding can be found in those students situated in Cluster 1. Those students who generally reported the lowest levels of school pressure, also reported having higher levels of emotional health and reported being less involved with bullying than the other two clusters. Certainly, our results are not definitive but they do support previous research findings. Other studies in Norway[32,20,21] and Poland[33] have also found more conclusive evidence linking the negative effects of increased school pressure on emotional health. The relatively low internal consistency of the scale used in our present study, a limitation to our findings, also likely masks the actual association between school pressure and the non-school outcomes. Nevertheless, our findings do extend such previous findings across a variety of other European and non-European countries and indicates the possible detrimental effects of higher levels of school pressure. In contrast, limited influence of school pressure on either emotional health or bullying has been found in Canada[34]. It is possible that there is a threshold that separates excessive school pressure from reasonable levels of school pressure, and these levels may not be consistent across countries.

Given the largely exploratory nature of our work, it is difficult to pinpoint the specific mechanisms linking school climate and school pressure to emotional health and bullying. Certainly, our findings suggest these links are there but they are also likely to be relatively small. Perhaps, these links are also mediated by school support. We were able to associate cluster membership with patterns of school support, suggesting that school support does have an association with school climate and pressure. Previous literature has similarly shown that school support is connected to both emotional health[17,12,20,21,19] and bullying[7,22,24]. Consequently, it may be a constellation of school experiences that coalesce in subjective perceptions of school climate and school pressure that create the noted relationships.

Our current findings, while largely aligned with other research findings, were somewhat limited by the analyses we could conduct with these data. We created the clusters and the scales based on the entire international dataset so that they would have the widest possible cross-national applicability. However, these clusters may not be pertinent in all countries, especially given the differences in the internal consistencies of some of the scales across countries. This problem is further complicated by the low internal consistencies of some of the scales, an issue that the HBSC research community contin-

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ues to address. There is more recent HBSC available than the 1997/98 data we used, but the 1997/98 data have the broadest number of school variables for the greatest number of countries. Our subsequent research will examine the identified relationships in the reduced number of countries who have used the school optional packages in subsequent surveys. Certainly, the differences in the clustering scales were generally small and these small differences make it difficult to provide more than tentative conclusions and findings. Yet, in spite of these small differences, our findings, continually aligned with previous research, do extend the identified relationships across a larger cross-national sample. Finally, it is not yet possible to attach directionality or causation to the associations we have identified; however, we believe we have identified potentially important avenues for subsequent research that continues to explore the links between schooling and health outcomes both within and across countries.

An historical challenge for the HBSC researchers has been the cross-country divergences in sampling methodology that would enable these data to be analysed using multilevel modeling. There have been ongoing efforts by the HBSC researchers to ensure sampling designs can make better use of the multilevel methods that are now being used, The original data collection in 1997/98 certainly allowed country comparisons but 2-level designs nesting students within the 28 countries is not ideal for multilevel modeling, especially given that the variance within each level tends to decrease dramatically with larger nested designs. The largest variance component continues to be at the first level (children), whether the research is measuring educational or health outcomes. We hope our present findings will provide a framework for this subsequent work.

This research is part of an ongoing investigation into the role schools can play in promoting positive health outcomes, both emotional and physical, for their students. An understanding of the cross-national differences in cluster membership certainly requires a more extensive investigation into cultural and educational differences. We have already started this investigation with respect to three countries (Canada, Norway, and Romania)[27] but intend to expand that research in the near future. While large-scale quantitative studies such as the HBSC survey reported here and cross-national comparisons will continue, we have already begun collecting information that will allow us to describe the contextual variables associated with health-promoting schools. As well, we are moving toward a greater combination of mixed-methods research, with qualitative and quantitative results complementing and enhancing each other, as we try to identify core elements of effective school policies that may benefit the health outcomes of early adolescents.

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## References

**1.** Keyes, CLM. Mental illness and/or mental health? Investigating axioms of the complete state model of health. J Consult Clin Psych 2005;73: 539–48.

**2.** WHO. Mental health. World Health Organization (WHO) 2004. (Accessed June 30, 2009, at http://www.who.int/mental_health/en.)

**3.** Paradis AD, Reinherz HZ, Giaconia RM, Fitzmaurice G. Major depression in the transition to adulthood: the impact of active and past depression on young adult functioning. J Nerv Ment Dis 2006;194:318–23.

**4.** Pine DS, Cohen P, Johnson JG, Brook JS. Adolescent life events as predictors of adolescent depression. J Affect Disorders 2002;68:49–57.

**5.** Rutter M, Kim-Cohen J, Maughan B. Continuities and discontinuities in psychopathology between childhood and adult life. J Child Psychol Psych 2006;47:276–95.

**6.** De Loore E, Drukker M, Gunther N, et al. Childhood negative experiences and subclinical psychosis in adolescence: a longitudinal general population study. Early Intervention in Psychiatry 2007;1:201–7.

**7.** Dill EJ, Vernberg EM, Fonagy P, Twemlow SW, Gamm BK. Negative affect in victimized children: the roles of social withdrawal, peer rejection, and attitudes toward bullying. J Abnorm Child Psych 2004;32:159–73.

**8.** Due P, Holstein BE, Lynch J, et al. Bullying and symptoms among school-aged children: international comparative cross sectional study in 28 countries. Eur J Public Health 2005;15:128–32.

**9.** Fekkes M, Pijpers FIM, Verloove-Vanhorick SP. Bullying behavior and associations with psychosomatic complaints and depression in victims. J Pediatr 2004;144:17–22.

**10.** van Hoof A, Raaijmakers QAW, van Beel Y, Hale WW, Aleva L. A multi-mediation model on the relations of bullying, victimization, identity, and family with adolescent depressive symptoms. J Youth Adolescence 2008;37:772–82.

**11.** Laukkanen E, Shemeikka S, Notkola IL, Koivumaa-Honkanen H, Nissinen A. Externalizing and internalizing problems at school as signs of health-damaging behaviour and incipient marginalization. Health Promot Int 2002;17:139–46.

**12.** Roeser R, Eccles JS, Sameroff AJ. School as a context of early adolescents' academic and social-emotional development: a summary of research findings. Elem School J 2000;100:443–71.

**13.** Kuperminc GP, Leadbeater BJ, Blatt SJ. School social climate and individual differences in vulnerability to psychopathology among middle school students. J School Psychol 2001; 39:141–59.

**14.** Newman BM, Newman PR, Griffin S, O'Connor K, Spas J. The relationship of social support to depressive symptoms during the transition to high school. Adolescence 2007;42:441–59.

**15.** Murray C, Greenberg MT. Children's relationship with teachers and bonds with school: an investigation of patterns and correlates in middle childhood. J School Psychol 2000;38:423–45.

**16.** Olweus D. Norway. In: Smith PK, Morita Y, Junger-Tas J, Olweus D, Catalano R, Slee P, eds. The nature of school bullying: A cross-national perspective. London, England: Routledge, 1999: 28–48.

**17.** LaRusso MD, Romer D, Selman RL. Teachers as builders of respectful school climates: implications for adolescent drug use norms and depressive symptoms in high school. J Youth Adolescence 2008;37:386–98.

**18.** Loukas A, Robinson S. Examining the moderating role of perceived school climate in early adolescent adjustment. J Res Adolescence 2004; 14:209–33.

**19.** Way N, Reddy R, Rhodes J. Students' perceptions of school climate during the middle school years: associations with trajectories of psychological and behavioral adjustment. Am J Commun Psychol 2007;40:194–213.

**20.** Torsheim T, Wold B. School-related stress, school support, and somatic complaints: a general population study. J Adolescent Res 2001a;16:293–303.

**21.** Torsheim T, Wold B. School-related stress, support, and subjective health complaints among early adolescents: a multilevel approach. J Adolescence 2001b;24:701–13.

**22.** Hazler RJ, Denham SA. Social isolation of youth at risk: conceptualization and practical implications. Journal of Counseling & Development 2002;80:403–9.

**23.** Hodges E V, Perry DG. Personal and interpersonal antecedents and consequences of victimization by peers. J Pers Soc Psychol 1999;76:677–85.

**24.** Hunt MH, Meyers J, Davies G, Meyers B, Rogers Grogg K, Neel J. A comprehensive needs assessment to facilitate prevention of school drop out and violence. Psychol Schools 2002;39:399–416.

**25.** Colvin, G., Tobin, T., Beard, K., Hagan, S., & Sprague, J. The school bully: assessing the problem, developing interventions, and future research directions. Journal of Behavioral Education 1998;8:293–319.

**26.** Klomek AB, Sourander A, Kumpulainen K, et al. Childhood bullying as a risk for later depression and suicidal ideation among Finnish males. J Affect Disorders 2008;109:47–55.

**27.** Freeman J, Samdal O, Bancila D. The relationship between school and emotional health: a cross-country comparison of Canada, Norway, and Romania. Paper presented at: Health Behaviour in School-aged Children conference 2009: Galway, Ireland.

**28.** Currie C. The international HBSC study: rationale, history and description. In: Currie C, Hurrelmann K, Settertobulte W, Smith R, Todd J, eds. Health and health behaviour among young people. Copenhagen, Denmark: World Health Organization, 2000:8–10.

**29.** Roberts C, Freeman J, Samdal O, et al. The Health Behaviour in School-aged Children (HBSC) study: Methodological developments and current tensions. Int J Public Health 2009; DOI: 10.1007/s00038-009-5405-9.

**30.** Olweus D. Bullying at school: long-term outcomes for the victims and an effective school-based intervention program. In: Huesmann R, ed. Aggressive behavior: current perspectives. New York, New York: Plenum Press, 1994: 97–130.

**31.** Landau S, Everitt BS. A handbook of statistical analyses using SPSS. Boca Raton, Florida: Chapman & Hall/CRC, 2004.

**32.** Natvig GK, Albrektsen A, Anderssen N, Qvarnstrøm U. School-related stress and psychosomatic symptoms among school adolescents. J School Health 1999;69:362–68.

**33.** Piekarska A. School stress, teachers' abusive behaviors, and children's coping strategies. Child Abuse Neglect 2000;24:1443–49.

**34.** Ma X. Bullying and being bullied: to what extent are bullies also victims? Am Educ Res J 2001;38:351–70.

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## APPENDIX A

VARIABLE ITEMS

*Perceived School Climate*
($\alpha$ = .73; range of $\alpha$ across countries: .53–.78)
- How do you feel about school at present?
- In our school the students take part in making rules.
- The rules in this school are fair.
- Our school is a nice place to be.
- I feel I belong at this school.
- Do you feel safe at school?

*School Pressure*
($\alpha$ = .54; range of $\alpha$ across countries: .23–.67)
- How pressured do you feel by the schoolwork you have to do?
- The students are treated too severely/strictly in this school.
- My parents expect too much of me at school.
- My teachers expect too much of me at school.

*Peer Support*
($\alpha$ = .69; range of $\alpha$ across countries: .54–.77)
- The students in my class(es) enjoy being together.
- Most of the students in my class(es) are kind and helpful.
- Other students accept me as I am.

*Teacher Support*
($\alpha$ = .73; range of $\alpha$ across countries: .58–.80)
- I am encouraged to express my own views in my class(es).
- Our teachers treat us fairly.
- When I need extra help, I can get it.
- My teachers are interested in me as a person.

Emotional Well-being
($\alpha$ = .69; range of $\alpha$ across countries: .33–.77)
- In general, how do you feel about your life at present?
- Do you ever feel lonely?
- How often do you feel left out of things?
- How often do you feel helpless?
- How often do you feel confident in yourself?

Psychosomatic Symptoms
($\alpha$ = .77; range of $\alpha$ across countries: .73–.83)
- In the last 6 months, how often have you had a headache?
- In the last 6 months, how often have you had a stomach-ache?
- In the last 6 months, how often have you had a back-ache?
- In the last 6 months, how often have you felt low?
- In the last 6 months, how often have you felt irritable or had a bad temper?
- In the last 6 months, how often have you felt nervous?
- In the last 6 months, how often have you had difficulties getting to sleep?
- In the last 6 months, how often have you felt dizzy?