



## **Evaluation of the Georgia Elementary School Climate Survey for Elementary School Children**

**Victor Martinelli<sup>1</sup> and Milosh Raykov**

*University of Malta, Malta*

School climate is a vital aspect of school life that influences students' emotional well-being, social relations and academic achievement. Therefore, educators need to monitor school climate to nurture good interpersonal relations and students' positive experiences in school. To achieve this objective, educators and psychosocial support services in schools need valid and reliable instruments to measure and monitor school climate. A review of the instruments for measuring school climate shows that they are available in several countries, but their application in these diverse settings requires evaluation and adaptation to the different conditions where they are being implemented. This study is part of a larger international project that examines the use of the Georgia Elementary School Climate Survey across many countries. The project includes students', parents', and educators' perceptions of school climate and aims to address the existing shortage of valid instruments of this important indicator of school life in Maltese educational settings. This study was based on responses from 592 children from five primary schools and focused on evaluating an adapted version of the Georgia Elementary School Climate Survey for primary school children. The study indicates that the slightly adapted scale has a good structure and acceptable internal consistency, indicating that the scale can be used in school practice. Based on the analysis of the items in the questionnaire, the study provides some suggestions for further development of this scale to respond better to the local educational setting.

**Keywords:** Georgia Elementary School Climate Survey, school connectedness, primary school, factor analysis, internal consistency.

First submission 30th August 2021; Accepted for publication 14<sup>th</sup> December 2021.

---

<sup>1</sup>

Corresponding author. Email address: [victor.martinelli@um.edu.mt](mailto:victor.martinelli@um.edu.mt)

## **Introduction**

School climate is a vital aspect of school life that influences students' academic achievement, social relations, emotional and overall well-being. An extensive body of evidence validates the many benefits of a positive school climate for students and schools. For example, a study demonstrated that teens connected to school are more respectful to teachers, show greater trust in them, enjoy their schooling, are more altruistic and engage more often in conflict resolution (Blum et al., 2005). This belonging runs concomitantly with all those positive characteristics associated with good studentship and increased mental and emotional well-being (Bond et al., 2007; Kuperminc et al., 2001; McNeely et al., 2002). Socially connected students are also more likely to develop supportive relationships with their peers (Battistich et al., 2004), and they are less likely to develop emotional problems (Burton et al., 2004). Research has also demonstrated that students who report feeling a sense of connectedness to school also exhibit fewer at-risk behaviours (Catalano et al., 2004; Foster et al., 2017), including experimenting with illegal substances, carrying or using a weapon, smoking, experiencing emotional distress, binge drinking, suicidal behaviour, and engaging in early-age sexual intercourse (Catalano et al., 2004; Langille et al., 2014). Healthy school environments contribute to school safety, effective teaching and learning, and relationships (Cohen et al., 2009; Thapa et al., 2013). The relationships dimension includes respect for diversity, adult and peer relationships, and school connectedness. School bonding and attachment, school engagement, and school climate are contributors to school connectedness (Marsh, 2018).

The concept of “school climate is a multidimensional construct that includes organizational, instructional, and interpersonal dimensions” (Loukas & Robinson, 2004, p. 210). In schools with a positive school climate, students feel that teachers will help them, that school rules are fairly enforced, and that teachers are supportive (Simons-Morton & Crump, 2003). In addition, the academic environment engenders the belief that adults in the school care about their learning and them as individuals (Goodenow, 1993). One aspect of a positive school climate is school connectedness. One term commonly used in school climate research is school connectedness. School connectedness relies on positioning systems and procedures that facilitate the development and perception of a positive school climate. Thus, school connectedness mediates or accounts for school climate effects but is narrower than school climate. It is a protective factor closely associated with important school outcomes. School connectedness is a “sense of belonging in the school or classroom, the extent to which they [students] feel personally accepted, respected, included, and supported by others in the school climate, particularly teachers and other adults” (Angus & Hughes, 2017, p. 75). It includes “perceptions of teacher and peer support” (Niehaus et al., 2012, p. 444). It is “to what extent students feel attached to at least one caring and responsible adult at school” (Cohen et al., 2009, p. 185). The terms ‘bonding’, ‘acceptance’, ‘belongingness’, ‘relatedness’, ‘membership’, ‘community’, and ‘attachment’ have been used synonymously in various studies to explain connectedness (Lohmeier & Lee, 2011). In schools with a positive school climate, teachers who demonstrate emotional warmth not only significantly contribute to their students’ social-emotional well-being, effectively enhancing their school connectedness, but they contribute to a healthy school climate and student academic success (Cefai, Cooper, & Vella, 2013; Cooper & Cefai, 2013). In

contrast, poor teacher and peer relationships, a lack of peer support, bullying, victimisation, and safety concerns have a deleterious effect on school connectedness that in turn results in poor psychological adjustment. Poorly adjusted students have low self-esteem heralding mental health problems like depression, anxiety, and suicidal ideation (Kuperminc et al., 2001; Loukas & Robinson, 2004; Way et al., 2007).

### *Theoretical underpinnings and operationalisation*

Two recent studies on the underpinnings of the concept of school connectedness (García-Moya et al., 2019; Hodges et al., 2018) apply different methodological approaches. García-Moya et al. (2019) identified five basic operationalisations of school connectedness, these being acceptance and care, belonging, liking/enjoyment, respect, and support. It was evident from the scoping review that there is a cornucopia of different school connectedness measures all underpinned by various constructs, although broadly falling under the five domains listed above. García-Moya et al. whittled down their initial selection of 1750 studies to 350 papers dealing with definitions and conceptualisations, of which a mere 20 empirical papers dealt with measures of school connectedness. These papers identified 11 such measures. Nevertheless, none of them addressed all five operationalisations of the construct. Only three measures addressed four operationalisations but not always the same four. Most measures addressed one or two operationalisations, usually the belonging and the liking/enjoyment operationalisations.

Hodges and colleagues (2018) opined that while the operationalisation and measurement of school connectedness has been challenging, three domains, the affective (acceptance, inclusion and belonging; respect; value; safety; autonomy and independence), the cognitive (academic self-efficacy; teacher relations and support; peer relations and support; academic support; discipline, fairness and order), and the behavioural (value parents place on school; involvement, participation and engagement; effort and persistence; conduct; interest or motivation), have been identified as the main contributors to students' sense of school connectedness. Even so, the differences in the underpinnings of many school connectedness measures hinder a direct comparison between the various measures and Hodges and colleagues (2018) concluded that the overall quality of psychometric properties of the measures they evaluated was limited. The school connectedness measures they scrutinised required further development and evaluation. They concluded that only two of the measures they considered, the School Climate Measure and the Student Engagement Instrument (35 item version), possessed solid psychometric properties. This systematic review underscored the necessity of further research to examine the psychometric properties of existing school connectedness measures. Our study focuses on evaluating a widely used instrument that has been found suitable for primary school children. Policymakers in many European countries are actively probing the issue of school climate as a factor linked to classic dimensions of social inequalities to “make a positive difference on the development of effort, persistence and perseverance [through] ... a positive school climate” (European Commission, 2019, p. 61). Furthermore, the recent EU policy documents (European Commission/EACEA/Eurydice, 2020)

identified improvement in school climate as one of the factors to be addressed in disadvantaged schools within the European Union.

### *Georgia School Climate Survey background*

The Georgia School Climate Survey is widely used for the improvement of school climate reform, with more than 1,400 schools (over 64% statewide) embracing a productive educational climate framework (Durham, 2021). The Georgia School Climate Survey is recognised as an essential component of school improvement to inform its school improvement processes (La Salle et al., 2016). There is compelling evidence to research school climate because it promotes good studentship and increases teacher retention (Cohen et al., 2009).

Traditionally, researching school climate at the primary school level has utilised teacher feedback more than pupil perceptions of climate (Johnson & Stevens, 2006) because objective self-report tests typically require the cognitive maturity and sophistication to make specific incremental judgments in responding to test items (Merrell, 2003). However, teachers can never replace students as the best source of information for expressing their perceptions of the school, and the “inclusion of student perceptions is a critical component of assessing school climate” (La Salle et al., 2016, p. 56). Thapa et al. (2013) identified the second half of primary schooling as ideal for such studies as students at that age can start reaching ethical conclusions about their environment, in this case, to inform positive school climate monitoring. On the other hand, it is important to acknowledge that student perceptions of school climate are influenced by personal characteristics and individual factors, such as gender, grade, and ethnicity (La Salle et al., 2016).

Extended surveys are to be preferred to shorter measures because they afford the researcher a good overview of the subject under scrutiny. However, Bandyopadhyay et al. (2009) explain how impractical it is to administer such instruments due to time constraints in the academic setting. Thus, shorter instruments need to be resorted to, and in the case of upper primary school children, a brief measure of school climate was deemed as “more likely to obtain accurate results among an upper elementary age range, as longer measures require sustained attention, which may tax these students’ reading and cognitive skills” (La Salle et al., 2016, p. 57).

Our study utilised the Georgia Elementary School Climate Survey as a brief measure of school climate used to assess upper elementary students’ perceptions of school climate. The ‘connectedness’ aspect was adopted because of younger students’ limited conceptualisation of school climate. This was the concept of school climate that young children could relate to. The purpose of our study was (a) to explore the usability of this tool in Maltese upper primary school classes; (b) to compare findings with La Salle (2020), who published national norms for the United States. In its present form, this tool is almost a replication of the Georgia Brief School Climate Inventory (GaBSCI) (White et al., 2014), which measures young students’ perceptions of school climate. The brevity of the original 9-item instrument made it ideal as a general measure that can be used to monitor student perceptions of school climate. The GaBSCI scale’s structure was statistically verified through factor analysis, and it was found to be sensitive to race/ethnicity, gender, and grade with respectable

statistical parameters. The Georgia Elementary School Climate Survey (the version used in this study) was adapted from the Georgia Brief School Climate Inventory (White et al., 2014) with the introduction of two peer relationship items suitable for upper primary school students. Confirmatory factor analysis (La Salle et al. results indicated a good model fit between the model and the data for the 11 item version and Hierarchical Linear Modeling (HLM) indicated that the majority of variance in elementary student perceptions of school climate was accounted for by student-level variables including gender, race/ethnicity, and grade (93%) (La Salle et al., 2016).

## **Method**

This study was conducted as a part of a wider International School Climate Collaborative (ISCC) that was initiated by members of the Research Committee of the International School Psychology Association (La Salle et al., 2021). In examining the use of the Georgia School Climate Survey (GSCS) across countries and cultures, this study focused on evaluating the short school climate scale for primary school students.

### *Participants*

The targeted group of participants of this study were upper primary school children who were 8 to 11 years of age attending Maltese public schools. Initially, 603 participants were recruited, and after removing outliers, this number was reduced to 592, including 271 boys (45.8%) and 319 girls (53.9%) and two respondents who did not indicate their gender (0.3%). As country leads for Malta, the authors were responsible for recruiting participants via context-specific professional education organisations, providing the information about the study and obtaining the consent of parents and assent of children to complete paper-and-pencil surveys. In addition, they also monitored data collection at school sites. This study was approved by the institutional ethics review board and an ethics committee board of the national educational authority for state schools.

The schools were randomly selected as cluster samples from a list of all colleges and primary schools in Malta. Out of eight randomly selected schools, five accepted invitations to participate in this study. All students were invited to participate in this voluntary study using a paper-and-pencil survey administered anonymously in each selected school. School leadership teams were instructed to send information letters to students and their parents, consent forms to parents, and assent forms to students. Based on the opt-in sampling technique, if the parents provided their consent and students assented, they were instructed to return completed surveys in a sealed envelope to their class teachers. All students from the selected five schools were invited to participate due to the limited opportunities for randomisation and the anonymity of the individual participants. This resulted in a convenience sample of primary school students being recruited for participation in this study.

The minimal sample size calculated for the margin of error of 5% with a 95% confidence level for a population of 12,556 students needed for the study was 373. Our sample was intentionally larger and included 592 participants to exceed this minimum. The margin of error for the recruited sample of 592 students is

±3.93%, with a 95% confidence level. These estimates were based on the National Statistics Office (2018, p. 14) report that in Malta, 12,556 students enrolled in Years 4, 5 and 6 in 2017.

The original survey of the International School Climate Collaborative (ISCC) was slightly modified with the ISCC's assistance according to the local classification of ethnicity, and some terminology was changed to improve its understanding in the local context. We did this to preserve the original survey content and make it easier for second language English speakers. Respondents completed the surveys independently during school hours. School personnel were not permitted to view students' responses during or after the survey. No personal identifying data were collected, and respondents were notified that they could skip questions or stop participating at any time. The survey took approximately 10–15 minutes to complete.

### *Measure*

The Georgia Elementary School Climate Survey is a self-report scale intended to measure upper elementary school students' perceptions of school climate (La Salle et al., 2016). It assesses students' overall perceptions of school climate through a brief survey format. The original form of the survey was developed by the Georgia Department of Education in collaboration with Georgia State University and the University of Connecticut. This scale for elementary school children is suitable for upper elementary school students in grades 3 to 5. However, the focus of this study is on students in the fourth, fifth, and sixth grades because students in Malta start their education earlier than in most other countries. The Georgia Elementary School Climate Survey includes 11 items of school connectedness. The reported sample average for the U.S. version of the Georgia Elementary School Climate Survey was 3.22, and the standard deviation of the scale was .47 (La Salle et al., 2016; La Salle, 2020).

### *Demographics*

The survey collected data about the school, grade, gender, and nationality of the participants. Five hundred and ninety-two children participated in the study from five primary schools located in different geographical parts of the island. The participating children attended fourth, fifth, and sixth grades, the last three years of primary schooling. Children attending these years were eight to ten years old. Two hundred and seven respondents were in Year 4, 224 were in Year 5 and, 157 were in Year 6. Four respondents did not identify their class. The sample comprised 319 females and 271 males. Two participants did not state their gender. Five hundred and sixteen participants described themselves as Maltese, and 75 described themselves as another nationality. Most children who reported foreign nationality were from 25 other, mostly non-English speaking countries

### *Statistical analysis*

Data obtained from this study were analysed using IBM SPSS Statistics (Version 26) and jamovi (jamovi 1.6, 2021). The study also calculated basic descriptive statistics (means and standard deviations) and differences

between different by gender, grade and nationality, based on t-tests and analysis of variance. Since the results were almost identical, parametric measures that are more suitable for the application of the scale in schools were presented. In addition to rank correlations, Cronbach's  $\alpha$  and McDonald's  $\omega$  was used to determine the internal consistency of the scale.

## Results

The 11 items of the Georgia Elementary School Climate Survey were rated by the participants on a 4-point likert scale. To make possible comparisons between the established norms and findings from this study, the items were coded from 1 (never) to 4 (always). A higher score indicated better school connectedness and vice versa. Overall, the population mean was 37.7 (S.D. = 3.87). The minimum score was 27, and the highest score was 44. The sample average for school climate was 3.42 (S.D. = .35), the minimum score was 2.10, and the highest score was 4. Table I below describes the frequencies and basic descriptive statistics of the 11 items in the questionnaire.

Table I. Descriptive statistics by survey item

	N	Mean	SD
1. I like school.	590	3.24	0.90
2. I feel like I do well in school.	589	3.22	0.77
3. My school wants me to do well.	592	3.87	0.44
4. My school has clear rules for behaviour.	591	3.85	0.43
5. I feel safe at school.	590	3.55	0.76
6. Teachers treat me with respect.	590	3.86	0.39
7. Good behaviour is noticed at my school.	587	3.38	0.79
8. Students in my class behave so that teachers can teach.	591	2.7	0.82
9. I get along with other students.	590	3.42	0.79
10. Students treat each other well.	588	2.94	0.81
11. There is an adult at my school who will help me if I need it.	589	3.65	0.75
Sum Total	570	37.7	3.87
Average	592	3.42	0.35

Table II provides a breakdown of the percentage of respondents agreeing with the statements provided in the questionnaire. As is evident, except for three items (2, 8, and 10), over 50% agreed wholly with the statements provided. In item 2 (I feel like I do well in school), only 41.9% thought they were doing well. This low score is indicative of the reality of student performance in state schools. Students responses to items 8 and

10 (Students in my class behave so that teachers can teach; Students treat each other well) may indicate less than ideal classroom relationships between teachers and students and students among themselves.

Table II. Distribution of responses (%) on the 11 items

	Never	Sometimes	Often	Always
1. I like school.	3.6	20.7	24.4	51.4
2. I feel like I do well in school.	1.0	18.3	38.7	41.9
3. My school wants me to do well.	0.5	2.5	6.4	90.5
4. My school has clear rules for behaviour.	0	2.9	9.5	87.6
5. I feel safe at school.	1.7	11.2	17.6	69.5
6. Teachers treat me with respect.	0	1.7	10.5	87.8
7. Good behaviour is noticed at my school.	0.7	17.2	25.9	56.2
8. Students in my class behave so that teachers can teach.	5.4	37.1	39.6	17.9
9. I get along with other students.	2.2	12.0	27.6	58.1
10. Students treat each other well.	1.4	31.5	38.9	28.2
11. There is an adult at my school who will help me if I need it.	3.2	6.8	12.2	77.8

A non-parametric correlation (see Table III) was conducted on the Georgia Elementary School Climate Survey items, which indicated that all items in the questionnaire correlated positively with one another at  $p \leq .05$  level of probability or better while a small number of correlations were not statistically significant. For example, the third item in the questionnaire (My school wants me to do well) did not correlate significantly because the variability of responses was severely reduced since most participants (90.5%) indicated highly positive answers (“always”) to this question.

There was a statistically significant difference between the genders regarding their overall perception of school climate or connectedness (Table IV). The difference between total score was statistically significant ( $t(566) = 2.52, p < .01, d = 0.21$ ) with females reporting slightly higher but statistically significant level of connectedness at school than males ( $F = 38.1, SD = 3.70$  vs.  $M = 37.3, SD = 4.04$ ). Female students reported higher scores on several items, but the differences were statistically significant only regarding items that indicate their general attitudes toward school (‘I like school’, Cohen’s Effect size  $d = 0.45$ ) and perceived safety (‘I feel safe at school’, Cohen’s Effect size  $d = 0.19$ ).



Table III. Spearman correlation matrix for the 11 items

	1	2	3	4	5	6	7	8	9	10	11
1. I like school.	1.000										
2. I feel like I do well in school.	.326**	1.000									
3. My school wants me to do well.	.176**	.037	1.000								
4. My school has clear rules for behaviour.	.152**	.067	.105*	1.000							
5. I feel safe at school.	.321**	.117**	.098*	.127**	1.000						
6. Teachers treat me with respect.	.248**	.106*	.214**	.205**	.261**	1.000					
7. Good behaviour is noticed at my school.	.244**	.233**	.131**	.229**	.263**	.196**	1.000				
8. Students in my class behave so that teachers can teach.	.214**	.147**	.054	.085*	.271**	.163**	.203**	1.000			
9. I get along with other students.	.220**	.196**	.076	.065	.155**	.225**	.215**	.280	1.000		
10. Students treat each other well.	.226**	.180**	.072	.138**	.231**	.173**	.279**	.383**	.315**	1.000	
11. There is an adult at my school who will help me if I need it.	.104*	.058	.179**	.169**	.215**	.195**	.158**	.172**	.145**	.158**	1.000

Note. Correlation is significant at the 0.01 level (2-tailed). Correlation is significant at the 0.05 level (2-tailed).

Table IV. Mann Whitney U test to investigate gender differences per test item.

	Females	Males	Mann Whitney U statistic	Asymptotic Significance (2-tailed)	Mean difference	Effect size Cohen's <i>d</i>
Q1. I like school.	3.42	3.02	32976.5	< .001	0.396	0.45
Q2. I feel like I do well in school.	3.26	3.16	400071.5	0.152	0.103	0.13
Q3. My school wants me to do well.	3.87	3.87	42751	0.649	0.004	0.01
Q4. My school has clear rules for behaviour.	3.86	3.83	79461.5	0.681	0.025	0.06
Q5. I feel safe at school.	3.62	3.47	38627.5	0.009	0.147	0.19
Q6. Teachers treat me with respect.	3.87	3.85	42258.5	0.579	0.024	0.06
Q7. Good behaviour is noticed at my school.	3.41	3.33	40359.5	0.240	0.087	0.11
Q8. Students in my class behave so that teachers can teach.	2.67	2.73	41437	0.399	-0.059	-0.07
Q9. I get along with other students.	3.43	3.39	42326	0.749	0.039	0.05
Q10. Students treat each other well.	2.92	2.96	41095	0.430	-0.044	-0.06
Q11. There is an adult at my school who will help me if I need it.	3.68	3.6	41166	0.273	0.078	0.10
Sum	38.1	37.29	2.51	0.012	0.818	0.21
Average	3.46	3.38	2.46	0.014	0.072	0.20

There was a tendency among younger students to report slightly higher scores on almost all items of the school connectedness scale, but the differences regarding single items as well as the total score as per Kruskal-Wallis test (Figure 1) were not statistically significant ( $\chi^2 = .986$ ,  $p = .611$ ,  $\epsilon^2 .00168$ ).

Comparisons of the differences regarding perception of school connectedness between domestic and migrant students found no statistically significant differences ( $t(589) = 0.783$ ,  $p < .383$ ,  $d = 0.11$ ). However, responses of children who migrated to Malta indicate greater variability (Figure 2) on all items indicating that some of them have a highly positive perception of school climate while some of them have experienced school climate less favourably. These results require further exploration with more sophisticated methodological approaches as well as monitoring and interventions to ensure a positive school experience for all students.

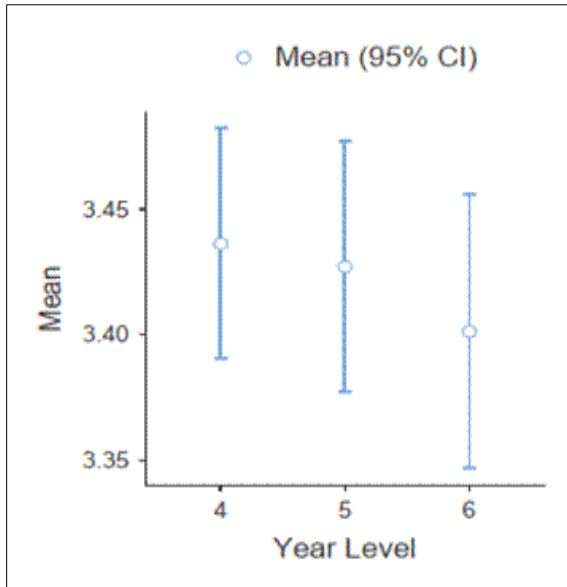


Figure 1. Mean score by year level

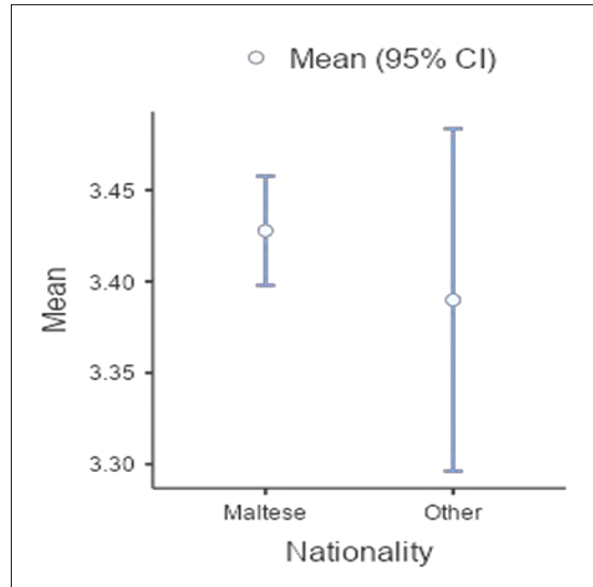


Figure 2. Mean score by students' nationality

The exploratory factor analysis of the Georgia Elementary School Climate Survey was conducted to determine the factor structure of the questionnaire because of the weak psychometric properties of such measures (Hodges et al., 2018). Principal component analysis was selected for extraction of factors and parallel analysis for determining the number of factors. The first eigenvalue was much higher than the other, and parallel analysis provided a clear indication that the one factor solution is the most appropriate for this scale and that other eigenvalues were a result of overfactorisation (Costello & Osborne, 2005; Floyd & Widaman, 1995). Also, the scree plot analysis in Figure 3 shows that the eigenvalues for the second, third and other factors were low and close to 1. The curve makes a sharp drop ('elbow') before the second eigenvalue, indicating that the one-factor solution was the most appropriate for the number of factors in this study.

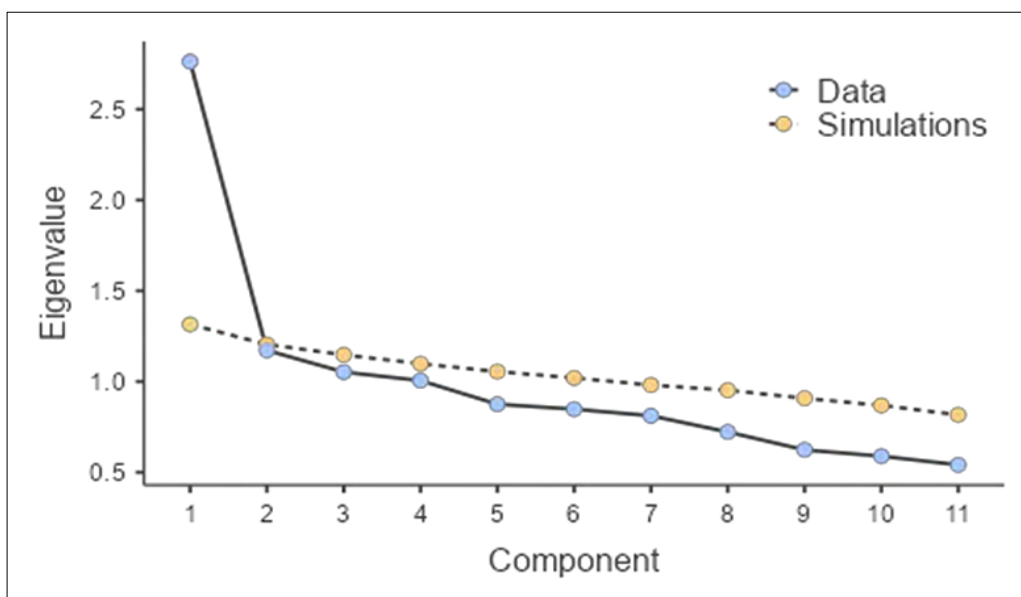


Figure 3. Scree Plot analysis

In addition, the analysis of the internal consistency of the full scale is significantly higher than the internal consistency of any other combination of items. In line with Parsons (2017), factors were rotated to identify the more robustly loading ones and minimise cross factor loading. Both orthogonal and oblique rotations of the extracted factors provided similar results. Table V presents an oblique rotation.

Table V. Principal Component Analysis and Internal Consistency

	Component 1	Uniqueness	Item-scale correlation	Cronbach's $\alpha$	McDonald's $\omega$
				if item dropped	if item dropped
Q1 I like school.	0.610	0.628	0.440	0.651	0.653
Q2 I feel like I do well in school.	0.450	0.798	0.308	0.676	0.679
Q3 My school wants me to do well.	0.225	0.949	0.144	0.694	0.699
Q4 My school has clear rules for behaviour.	0.352	0.876	0.221	0.687	0.687
Q5 I feel safe at school.	0.583	0.660	0.409	0.658	0.660
Q6 Teachers treat me with respect.	0.497	0.753	0.341	0.677	0.669
Q7 Good behaviour is noticed at my school.	0.559	0.688	0.389	0.661	0.662
Q8 Students in my class behave so that teachers can teach.	0.592	0.649	0.424	0.655	0.659
Q9 I get along with other students.	0.489	0.761	0.330	0.672	0.674
Q10 Students treat each other well.	0.622	0.613	0.455	0.649	0.653
Q11 There is an adult at my school who will help me if I need it.	0.372	0.861	0.242	0.687	0.684

The Kaiser-Meyer-Olkin measure of sampling adequacy was above the commonly recommended value of .6 that is considered as a criterion for acceptable sampling adequacy. Also, Bartlett's test of sphericity was significant ( $\chi^2 (59) = 689, p < .001$ ), indicating that the correlation matrix was suitable for factorization. This low communality for some items suggests a need for cautious interpretation of the one factor solution obtained by the exploratory factor analysis since school climate is a highly complex construct, and this short version was adopted as suitable for younger students (La Salle et al., 2016). Another reason for accepting the one-factor solution was that the internal consistency of the Georgia Elementary School Climate Survey as measured by two methods was .69 (Cronbach's  $\alpha = .691$ ; McDonald's  $\omega = .692$ ). These were very close to the threshold value of .7, which is considered as satisfactory (Taber, 2018). The advantage of McDonald's omega compared to Cronbach's alpha is that the former takes into account the strength of association between items and constructs as well as item-specific measurement errors making for more realistic estimates of true reliability of the scale (Lance et al. 2006).

The Georgia Elementary School Climate Survey possesses a certain degree of construct validity as indicated by the high goodness of fit ( $\chi^2(44) = 149, p < .001$ ), but it has a relatively low comparative fit index (CFI = .84), low Tucker–Lewis index (TLI = .8), and only an acceptable but not ideal mean square error of approximation (RMSEA = .64). All these results suggest caution in interpreting more than one factor and that a longer version with a larger number of items representing various components of school climate. When items that correlated less than .3 with the rest of the other items in the scale were removed (Table VI), the confirmatory analysis demonstrated a better fit to the one-factor solution ( $\chi^2(27) = 75.1, p < .001$ , CFI = 0.91, TLI = 0.88, SRMR = 0.04, and RMSEA = 0.05). Most measures ( $\chi^2/df$  ratio, SRMR and RMSEA) satisfy more restrictive criteria for model fit (Hu & Bentler, 1999) while CFI of .91 is slightly above and TLI of .88 is slightly below the less restrictive criteria recommended by Marsh et al. (2004). The path diagram (Figure 4) shows that most correlations between the items of the school climate scale and the latent variable are relatively high (between .37 and .56), while only one item (Q11) has lower correlation with the latent variable (.27). Overall, the metric characteristics of the scale are acceptable, as well as the latent structure of Georgia Elementary School Climate Survey.

Table VI. Confirmatory Factor Analysis (CFA) Factor Loadings and Fit Measures

Indicators	Estimate	SE	Z	p	Stand. Estimate			
Q1. I like school.	0.443	0.043	10.41	< .001	0.493			
Q2. I feel like I do well in school.	0.289	0.037	7.77	< .001	0.374			
Q5. I feel safe at school.	0.376	0.036	10.58	< .001	0.496			
Q6. Teachers treat me with respect.	0.145	0.019	7.69	< .001	0.369			
Q7. Good behaviour is noticed at my school	0.365	0.037	9.92	< .001	0.464			
Q8. Students in my class behave so that teachers can teach.	0.441	0.038	11.51	< .001	0.536			
Q9. I get along with other students.	0.335	0.037	9.04	< .001	0.427			
Q10. Students treat each other well.	0.45	0.038	12.02	< .001	0.56			
Q11. There is an adult at my school who will help me if I need it.	0.202	0.036	5.55	< .001	0.27			
CFA Fit Measures								
$\chi^2$	df	p	CFI	TLI	SRMR	RMSEA	Lower 95% CI	Upper 95% CI
75.1	27	< .001	0.91	0.88	0.04	0.05	0.04	0.07

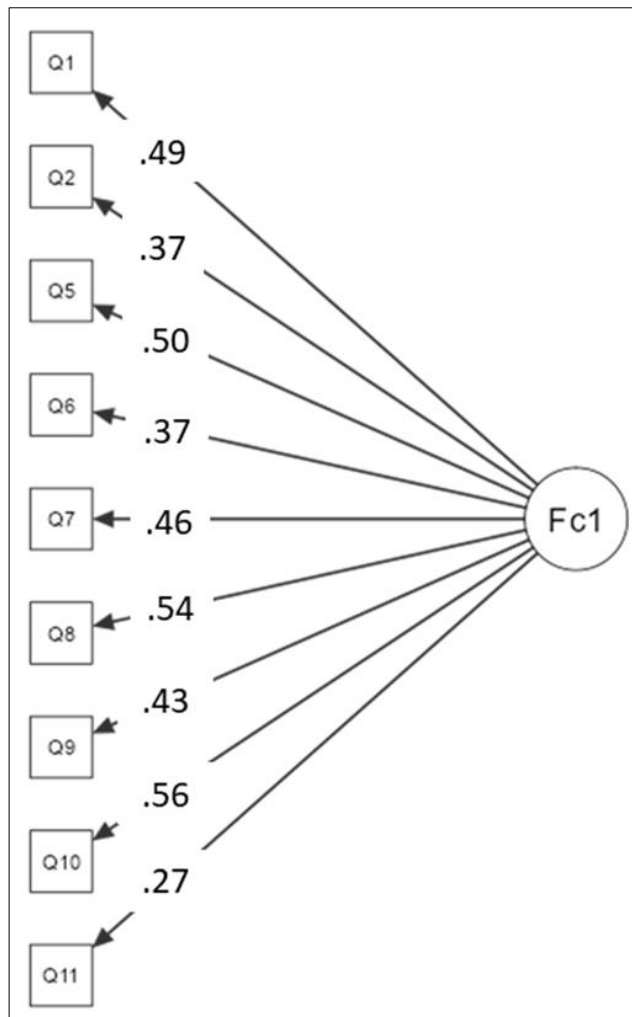


Figure 4. The path diagram with correlations between the latent variable and the items

## Discussion

The one-factor solution accounts for 25.12% of the variance in the Georgia Elementary School Climate Survey. This may suggest that the scale that was evaluated may not possess strong psychometric properties (Hodges et al., 2018). However, the percentage of the explained variance is not universally accepted as a criterion for determining the number of factors (Cangelosi & Goriely, 2007). The decision on the number of factors requires familiarity with the content and the concept as well as consideration of some other statistical indicators. Our confirmatory factor analysis, relatively good Cronbach's  $\alpha$  and McDonald's  $\omega$  internal consistency coefficients, together with the relatively high average component loading for the scale consisting of the 11 items (.49) and slightly higher (.54) for the nine core variables selected through the confirmatory factor analysis, justifies the acceptance of the one-factor solution.

Our average component loading (.54) is significantly higher than the average loading of .21 that was reported in a meta-analysis of a large number of exploratory factorisations (Peterson, 2000). Also, most of the intercorrelations (82%) between the 11 variables are statistically significant (Table III), as well as the

correlations between the item and the scale (Table V). These findings also support the decision to accept a one-factor solution for this brief version of the scale. It is well-known that the concept of school climate is complex and contains several dimensions identified with the instruments with a larger number of items (García-Moya et al., 2019). With the 11 questions included in the short version of the Georgia Elementary School Climate Survey, it is justifiable to accept this solution because of its relatively high saturation of the average component loading and the large number of positive correlations among the items. The low percentage of the explained variance by the single factor based on parallel analysis indicates the possibility for extraction of multiple factors. However, it would be unlikely to obtain reliable measures with only 11 items. The one factor solution was accepted, keeping in mind the relatively high average component loading, positive inter-item correlations, and this study's objective to evaluate a short version of the Georgia Elementary School Climate Survey.

García-Moya et al.'s (2019) five basic operationalisations of school connectedness; acceptance and care, belonging, liking/enjoyment, respect, and support, predictably are not evident in this scale, but items 3, 4 and 11 are the ones that load most highly onto the one suggested factor. Between them, these three items (My school wants me to do well; My school has clear rules for behaviour; There is an adult at my school who will help me if I need it) appear to typify this one factor. Contrastingly, García-Moya and colleagues stated that most of the papers they reviewed tended to identify the 'belonging' and the 'liking/enjoyment' constructs of school connectedness and less the other constructs of acceptance and care, respect, and support. This one factor seems to be identifying care and support or what we termed as organisational regulation in the school setup.

On the other hand, Hodges et al. (2018) describe how three domains, the affective, the cognitive and the behavioural, appear to underlie most measures of school connectedness whilst at the same time stressing how challenging it is to conduct direct comparisons between different measures and how limited this could be. They opined that only the longer versions of such school connectedness and school climate measures with many constituent items are likely to possess good psychometric properties.

The Georgia Elementary School Climate Survey is short due to young children's limited attention and staying power when answering long questionnaires. The length of the scale inevitably limits the possible number and characteristics of the extracted factors. One can only expect approximate results when comparing the identified factor with the broad range of factors that instruments for older students contain.

La Salle et al.'s (2016) reported a mean of 3.22 (S.D. = .47), and this study's sample average of 3.42 (S.D. = .35) would suggest that children in Maltese schools report slightly higher levels of school connectedness than children in her study, with females in this study reporting slightly higher levels of connectedness to their school than males.

In conclusion, the Georgia Elementary School Climate Survey is a relatively short but valuable measure of school climate/connectedness that possesses acceptable internal consistency as indicated by Cronbach's  $\alpha$  and McDonald's  $\omega$ , as well as a certain degree of construct validity as indicated by the high

goodness of fit  $\chi^2$  value, comparative fit index (CFI = 0.92), Tucker–Lewis index (TLI = 0.89) and mean square error of approximation (RMSEA = 0.05) when some non-discriminative items were excluded. The Georgia Elementary School Climate Survey provides a brief measure of students’ general perception of school climate but cannot provide precise insight into the notion of the affective, cognitive, and behavioural aspects of school climate. However, the scale provides relatively reliable estimates of children’s perceptions of organisational order, expectations, respect and care in their school and how these influence their feelings of connectedness to the school and the people in it. Whilst cognisant of the young children’s limited attention spans and depth of understanding, it seems possible to modify some questions and consider expanding the scale with additional dimensions of some of the constructs of school climate or connectedness as defined in the form of the scale for older students.

## References

- Angus, R., & Hughes, T. (2017). School climate, connectedness and academic achievement: Examining positive impacts from high school mentoring services. *NCPEA Education Leadership Review of Doctoral Research, 4*, 69-84.
- Bandyopadhyay, S. C., Cornell, D. G., & Konold, T. R. (2009). Validity of three school climate scales to assess bullying, aggressive attitudes, and help seeking. *School Psychology Review, 38*, 338-355.
- Battistich, V., Schaps, E., & Wilson, N. (2004). Effects of an elementary school intervention on students’ “connectedness” to school and social adjustment during middle school. *Journal of Primary Prevention, 24*(3), 243. Retrieved from <https://www-proquest-com.ejournals.um.edu.mt/scholarly-journals/effects-elementary-school-intervention-on/docview/219936984/se-2?accountid=27934>
- Blum, R. W., McNeely, C., & Rinehart, P. (2005). *Improving the odds: The untapped power of schools to improve the health of teens*. Center for Adolescent Health and Development, University of Minnesota.
- Bond, L., Butler, H., Thomas, L., Carlin, J., Glover, S., Bowes, G., et al. (2007). Social and school connectedness in early secondary school as predictors of late teenage substance use, mental health, and academic outcomes. *Journal of Adolescent Health, 40*, 357  
<https://doi.org/10.1016/j.jadohealth.2006.10.013>
- Burton, E. M., Stice, E., & Seeley, J. R. (2004). A prospective test of the stress-buffering model of depression in adolescent girls: No support once again. *Journal of Consulting and Clinical Psychology, 72*, 689–697. <https://doi.org/10.1037/0022-006X.72.4.689>
- Cangelosi, R., & Goriely, A. (2007). Component retention in principal component analysis with application to cDNA microarray data. *Biology direct, 2*(1), 1-21.



- Cefai, C., Cooper, P., & Vella, R. (2013). A whole-school approach to positive behaviour in a girls' secondary school. *International Journal of Inclusive Education*, 17(7), 700-713.  
<https://doi.org/10.1080/13603116.2012.708362>
- Cooper, P., & Cefai, C. (2013). Evidence-based approaches to social, emotional and behavior difficulties in schools. *KEDI Journal of Educational Policy*, 10(3), 81-101. Retrieved from  
<http://repository.lib.eduhk.hk/jspui/handle/2260.2/15412>
- Catalano, R. F., Haggerty, K. P., Oesterle, S., Fleming, C. B., & Hawkins, J. D. (2004). The importance of bonding to school for healthy development: Findings from the social development research group. *The Journal of School Health*, 74(7), 252-61. <https://doi.org/10.1111/j.1746-1561.2004.tb08281.x>
- Cohen, J., McCabe, E.M., Michelli, N.M., & Pickeral, T. (2009). School climate: research, policy, practice, and teacher education. *Teachers College Record*, 111 (1), 180–213.  
<https://doi.org/10.1177/016146810911100108>
- Costello, A. B. & Osborne. J. (2005). Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Practical Assessment Research & Evaluation*, 10(7).  
<https://doi.org/10.7275/jyj1-4868>
- Durham, C. (2021, March 21). *The importance of Georgia's School Climate Star Rating and the inclusion of school discipline data*. Georgia Appleseed Center for Law and Justice. Retrieved from  
<https://cfgreateratlanta.org/2021/03/29/georgias-school-climate-star-rating/>
- European Commission. (2019). Education and training monitor 2019. Retrieved from  
<https://www.schooleducationgateway.eu/en/pub/resources/publications/education-training-monitor2019.htm>
- European Commission/EACEA/Eurydice. (2020). *Equity in school education in Europe: Structures, policies and student performance*. Eurydice report. Luxembourg: Publications Office of the European Union. Retrieved from  
[https://eacea.ec.europa.eu/nationalpolicies/eurydice/sites/default/files/equity\\_2020\\_0.pdf](https://eacea.ec.europa.eu/nationalpolicies/eurydice/sites/default/files/equity_2020_0.pdf)
- Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment*, 7(3), 286–299. <https://doi.org/10.1037/1040-3590.7.3.286>
- Foster, C. E., Horwitz, A., Thomas, A., Opperman, K., Gipson, P., Burnside, A., . . . King, C. A. (2017). Connectedness to family, school, peers, and community in socially vulnerable adolescents. *Children and Youth Services Review*, 81, 321-331. <https://doi.org/10.12738/estp.2016.2.0328>
- García-Moya, I., Bunn, F., Jiménez-Iglesias, A., Paniagua, C., & Brooks, F. M. (2019). The conceptualisation of school and teacher connectedness in adolescent research: A scoping review of literature. *Educational Review*, 71(4), 423-444. <https://doi.org/10.1080/00131911.2018.1424117>

- Goodenow, C. (1993). Classroom belonging among early adolescent students: Relationships to motivation and achievement. *Journal of Early Adolescence*, 13(1), 21-43.  
<https://doi.org/10.1177/0272431693013001002>
- Hodges, A., Cordier, R., Joosten, A., Bourke-Taylor, H., & Speyer, R. (2018) Evaluating the psychometric quality of school connectedness measures: A systematic review. *PLoS ONE* 13(9):e0203373.  
<https://doi.org/10.1371/journal.pone.0203373>
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, 6(1), 1-55.
- The jamovi project (2021). *jamovi*. (Version 1.6) [Computer Software]. Retrieved from Retrieved from  
<https://www.jamovi.org>
- Johnson, B., & Stevens, J. J. (2006). Student achievement and elementary teachers' perceptions of school climate. *Learning Environments Research*, 9, 111–122. doi:10.1007/s10984-006-9007-7
- Kaiser, H. F., & Rice, J. (1974). Little Jiffy, Mark IV. *Educational and Psychological Measurement*, 34(1), 111–117. <https://doi.org/10.1177/001316447403400115>
- Kuperminc, G. P., Leadbeater, B. J., & Blatt, S. J. (2001). School social climate and individual differences in vulnerability to psychopathology among middle school students. *Journal of School Psychology*, 39, 141–159.
- Lance, C. E., Butts, M. M. & Michels, L. C. (2006). The Sources of four commonly reported cutoff criteria: what did they really say? *Organizational Research Methods*, 9, 202-220.  
<https://doi.org/10.1177/1094428105284919>
- La Salle, T. P. (2020, May). *How are Schools Using the School Climate Surveys?* Center on Positive Behavioral Interventions & Support. Retrieved from [https://assets-global.website-files.com/5d3725188825e071f1670246/5eac8ca630994e73a3015897\\_How%20are%20Schools%20Using%20the%20School%20Climate%20Surveys.pdf](https://assets-global.website-files.com/5d3725188825e071f1670246/5eac8ca630994e73a3015897_How%20are%20Schools%20Using%20the%20School%20Climate%20Surveys.pdf)
- La Salle, T. P., Zabek, F., & Meyers, J. (2016). Elementary student perceptions of school climate and associations with individual and school factors. *School Psychology Forum: Research in Practice*, 10 (1), 55–65.
- La Salle, T. P., Rocha-Neves, J. Jimerson, S. Di Sano, S. Martinsone, B., Majercakova Albertova, S., Gajdošová, E., Deltour, C., Baye, A., Hatzichristou, C., Martinelli, V., Raykov, M., Palikara, O., Szabó, É., Arlauskaitė, Z., Athanasiou, D. Brown-Earle, O. Casale, G., Lampropoulou, A. & Mikhailova, A. (2021). A multinational study exploring adolescent perception of school climate and mental health. *School psychology*, 36(3), 155-166. <https://doi.org/10.1037/spq0000430>
- Langille, D. B., Asbridge, M., Azagba, S., Flowerdew, G., Rasic, D., & Cragg, A. (2014). Sex differences in associations of school connectedness with adolescent sexual risk-taking in Nova Scotia, Canada. *Journal of School Health*, 84(6), 387-395. <https://doi.org/10.1111/josh.12161>

- Lohmeier, J. H., & Lee, S. W. (2011). A school connectedness scale for use with adolescents. *Educational Research and Evaluation*, 17(2), 85-95. <https://doi.org/10.1080/13803611.2011.597108>
- Loukas, A., & Robinson, S. (2004). Examining the moderating role of perceived school climate in early adolescent adjustment. *Journal of Research on Adolescence*, 14(2), 209–233. <https://doi.org/10.1111/j.1532-7795.2004.01402004.x>
- Marsh, R. J. (2018). Building School Connectedness for Students with Emotional and Behavioral Disorders. *Intervention in School and Clinic*, 54(2) 67–74. <https://doi.org/10.1177/1053451218765219>
- Marsh, H. W., Hau, K. T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural equation modeling*, 11(3), 320-341.
- McNeely, C. A., Nonnemaker, J. M., & Blum, R. W. (2002). Promoting student connectedness to school: Evidence from the national longitudinal study of adolescent health. *Journal of School Health*, 72, 138–146. <https://doi.org/10.1111/j.1746-1561.2002.tb06533.x>
- Merrell, K. W. (2003). *Behavioral, social, and emotional assessment of children and adolescents* (2nd ed.). Erlbaum.
- National Statistics Office. (2018). *Statistics on Pre-primary, Primary and Secondary Formal Education*. National Statistics Office.
- Niehaus, K., Rudasill, K. M., & Rakes, C. R. (2012). A longitudinal study of school connectedness and academic outcomes across sixth grade. *Journal of School Psychology*, 50(4), 443–460. <https://doi.org/10.1016/j.jsp.2012.03.002>
- Parsons, M. M. (2017). Factor Analysis: Exploratory. In M. Allen (Ed.), *The Sage encyclopedia of communication research methods* (Vols. 1-4). SAGE Publications, Inc. <https://dx.doi.org/10.4135/9781483381411>
- Peterson, R. A. (2000). A meta-analysis of variance accounted for and factor loadings in exploratory factor analysis. *Marketing letters*, 11(3), 261-275.
- Simons-Morton, B. G., & Crump, A. D. (2003). Association of parental involvement and social competence with school adjustment and engagement among sixth graders. *Journal School Health*, 73(3), 121-126. <https://doi.org/10.1111/j.1746-1561.2003.tb03586.x>
- Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in science education*, 48(6), 1273-1296.
- 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>
- Way, N., Reddy, R., & Rhodes, J. (2007). Students' perceptions of school climate during the middle school years: Associations with trajectories of psychological and behavioral adjustment. *American Journal of Community Psychology*, 40(3–4), 194–213. <https://doi.org/10.1007/s10464-007-9143-y>

White, N., La Salle, T. P., Ashby, J. S., & Meyers, J. (2014). A brief measure of adolescent perceptions of school climate. *School Psychology Quarterly*, 29, 349–359. <https://doi.org/10.1037/spq0000075>