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Development and Standardization of School Climate Scale

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ABSTRACT: This study reports the development and standardization of a School Climate Scale in Malayalam, designed to address the lack of culturally appropriate instruments in the Indian educational context. Drawing on ecological systems theory and existing definitions of school climate, an initial pool of 36 items was created and refined through expert review, resulting in 18 items. Following item analysis and exploratory factor analysis, 12 items were retained, representing three dimensions: relationships and interaction, safety and discipline, and learning environment. The scale was administered to 250 higher secondary students in Kerala, aged 14–19, and demonstrated satisfactory reliability (Cronbach's $\alpha = .84$) and validity. Confirmatory factor analysis indicated good model fit, supporting the three-factor structure. Norms were established separately for male and female students. The finalized instrument provides a reliable, culturally relevant tool for assessing school climate in Malayalam-medium schools, with applications for research, diagnosis, and educational improvement.

KEYWORDS: School climate, Relationships and interaction, Security and discipline, Learning Environment

INTRODUCTION

School climate concept has its origins in the late 1950s as researchers in social sciences studied variations in work environments. School climate is situated within ecological systems theory by Bronfenbrenner (1979), which directs future research and help specify the levels of research or analysis, thereby providing utility as a theoretical framework for future causal models. The great research works of Halpin and Croft (1963) put forward the construct of school climate and their work developed the basis of research for researchers. Halpin and Croft (1963) defined school climate in terms of teachers' perceptions of the school's personality. As one of the leading researchers in school climate research, The National School Climate Center (NSCC,2014), defined school Climate as "the character and quality of school life".

According to Thapa et al. (2013), it encompasses several aspects, such as safety, relationships, teaching and learning, institutional environment, and school improvement. A positive school climate is associated with fewer disciplinary problems, higher student engagement, and better academic performance. Negative school climate can lead to student disengagement, behavioural issues, and even higher dropout rates. Studies are increasingly highlighting the importance of creating a supportive school climate. An NSCC report from 2022 indicates that a positive school climate not only boosts academic performance but also improves social-emotional skills, reduces bullying, and improves teacher satisfaction. The findings highlight the necessity for schools to prioritize climate improvement as an educational objective.

Dimensions of school climate

Janosz (2012) argued that the analysis of school climate should be carried out taking into consideration the five interrelated angles, allowing us to understand a specific climate aspect. The relational climate highlights the social and emotional dimensions of relationships between individuals. The educational climate denotes to the value placed on the school's formative and educational mission, as perceived by the actors involved in the school environment. A school with a good educational climate covers the quality of education. The safety climate mentions to "the order and peacefulness of the environment" and how this order provides a safe environment for learning. A climate of justice reliant on the capability of the school system and its actors to treat its students justly. The final dimension is belonging, which develops once the other components are secured.

Recent research continues to highlight the importance of cultivating a supportive school climate. An NSCC report (2022) found that schools with positive climates not only achieve higher academic performance but also strengthen students' social-emotional skills, reduce bullying, and improve teacher satisfaction. These findings suggest that climate improvement should be viewed as a central educational objective rather than a peripheral concern. Gregory et al. (2021) reinforce this perspective, showing that positive relationships within schools reduce conflict, enhance cooperation, and improve overall climate. Such indication validates that climate is both a protective factor against mental health challenges and a driver of educational equity, particularly for marginalized students. Briefly, it can say that a positive school climate discloses good interpersonal relationships, quality on teaching/learning process, sense of justice in applying sanctions, opportunities for participation, people feel safe and belonging to that educational climate and communication perceived by everyone at school.

Development and Planning of School Climate Scale

In the Indian educational context, particularly within diverse cultural, linguistic, and socio-economic settings, understanding school climate becomes highly significant. However, despite its importance, systematic and culturally appropriate assessment of school climate remains

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limited. Most available school climate scales are developed in Western countries and reflect cultural assumptions, educational norms, and social dynamics that may not align with Indian realities. The direct adoption of such tools often compromises validity and interpretability, especially when used with Indian students.

Furthermore, many existing school climate instruments primarily capture teachers' or administrators' perceptions, overlooking students lived experiences within the school environment. In a student-centric educational framework, especially at the higher secondary level where adolescents face academic pressure, identity formation, and emotional challenges, students' perceptions of safety, support, relationships, discipline, and academic climate are critical indicators of school functioning.

Language is another major barrier in the Indian context. Most standardized school climate tools are available only in English and are often lengthy and cognitively demanding, making them unsuitable for students from regional-medium schools. In states like Kerala, where Malayalam is the primary medium of instruction for a large segment of students, the absence of standardized tools in the native language restricts meaningful assessment and research. Furthermore, most of the existing instruments that are designed for students are often lengthy and in English language. While searching an instrument to measure school climate in Malayalam absolutely no standardized psychological instruments are available for people who read and write Malayalam. Considering the importance of school climate which is little researched area in Kerala, especially in higher secondary educational institutions. The investigator decided to construct and standardise an instrument based on psychological theories and using the principles of psychometrics and psychological measurement with minimum number of items in Malayalam language.

Preparation of items

Based on the available theories and definitions, the school climate definition has been derived. Based on the definitions and theories, investigator prepared items in Malayalam language. The response category of the instrument is 5-point Likert type (Agreement format). Initially the investigator has prepared 36 items. Every item has been provided 5 response categories namely 'Strongly agree', 'Agree', 'Neutral', 'Disagree', and 'Strongly disagree'. Then, these 36 items were given to experts from different universities who were well versed in the field and scale construction with a request to review the statements and evaluate their content, accuracy, and suitability. The draft scale was also given to a panel of subject experts which includes college teachers and psychologists. With the suggestions and recommendations of subject experts, many items were dropped, modified, and even rewritten. Since it is in regional language (Malayalam) the draft scale was given to language experts for verifying the structure and appropriateness of each item and finally the draft scale consists of 18 items.

METHOD

Participants

Participants of the study consist of 250 students and their age ranges from 14 to 19. Among them 111 were males and 139 were females. All participants belong to Kerala, and speak Malayalam language.

Instruments

1. School climate Scale: School climate scale consists of 18 items in Malayalam language. Instructions were clearly printed on the top of the scale and subjects will take below 15 minutes to respond the statements. Using a 5-point Likert scale, participants indicate the extent to which they agree with statements describing their school climate. All positive items would be given a score of 5, 4, 3, 2, 1, and all negative items would be given a score of 1, 2, 3, 4, 5. Subsequently, the scores earned by the testee on each item are added to get a total score.
2. Personal data sheet: Personal data sheet was used to collect information like sex, age, religion, family size, and birth order, etc.

Try Out

The prepared draft of School climate scale was ready for first try out. To know how will be the students receive, perceive, interpret, and respond each item and any difficulty in responding to the items in the scale; it was administered among 40 1st semester UG psychology students. Almost all respondents reported that they have no difficulty in understanding the meaning of the statements, marking the responses, etc.

Procedure

For the purpose of the study, subjects were selected from various schools of Kerala. After getting sanction letter from the selected schools, the investigator contacted the class mentors. Then the class teacher/advisor introduced the investigator to the students and directed them to cooperate with the research work. Then the investigator once again introduced to the students and explained the objective and purpose of the work. First of all, informed consent from the participants was ensured and a very good rapport was established. All the doubts regarding the study were cleared and also assured that the information given by them will be kept confidential and used only for research purposes. The participants independently completed the school climate scale, which took approximately 15 minutes to complete. Participation was voluntary and completely anonymous. After completion, it was collected back and checked for omission. Then both instruments were scored, coded as per the previously prepared scoring key and entered into a spreadsheet for further statistical analysis.

RESULTS AND DISCUSSION

This study aims at the construction and standardization of a valid instrument on school climate. In order to establish its psychometric properties the investigator used traditional as well as new methods.

Item Analysis

The responses of all subjects in each item were entered into a spread sheet and loaded into statistical software. There are many methods available for items selection. Here the investigator decided to calculate the corrected item-total correlation (Point Biserial Correlation), discriminating power and factor loading of each item in the scale. The criterion for including an item in the scale was, if an item achieves corrected item-total correlation of 0.25 or above discriminating power greater than 2.58 (t value) as proposed by Edwards (1957) and item loading 0.45 or above will be include in the final scale. The details of the computations are given in table 1.

Table 1: Item statistics (Item total Correlation and Discriminating Index)

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	't' value
Item 1	58.55	84.409	.501	10.91
Item 2	58.73	93.704	.043*	1.29*
Item 3	58.09	87.347	.488	9.81
Item 4	58.30	82.936	.516	11.24
Item 5	58.42	83.752	.409	9.61
Item 6	58.54	93.193	.101*	1.21*
Item 7	58.27	82.736	.572	11.57
Item 8	58.34	79.185	.561	13.13
Item 9	58.66	86.636	.300	4.87
Item 10	58.08	92.352	.113*	1.6*
Item 11	58.85	80.452	.527	14.06
Item 12	58.56	83.602	.530	9.82
Item 13	58.23	93.236	.044*	.44*
Item 14	58.78	84.003	.366	8.87
Item 15	58.23	93.443	.072*	1.25*
Item 16	58.49	79.606	.594	12.72
Item 17	58.68	92.830	.100*	.71*
Item 18	58.42	83.131	.491	8.29

**Items which are deleted from the final scale*

From table 1, it can be seen that 6 out of 18 item 't' values are below 2.58 ($p < .01$). Hence items 2, 6, 10, 13, 15 and 17 were decided to not include in the final scale. The remaining 12 items in the school climate scale significantly discriminate the low and high scores in the school climate scale.

The second criteria for the item selection were, an item which have an item total correlation of 0.25 or above will be included in the school climate scale. Hence the investigator has calculated the corrected item total correlation of each item. When the item total correlations were scrutinized items 2, 6, 10, 13, 15, 17, were found to have item total correlation below 0.25. As per the criteria, these items are not satisfying the criteria, hence the items, 2, 6, 10, 13, 15 and 17 were decided to delete from the final scale.

Table 2: Exploratory factor analysis (EFA) of School climate scale

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.513	37.605	37.605	4.513	37.605	37.605	2.788	23.233	23.233
2	1.209	10.073	47.678	1.209	10.073	47.678	2.142	17.854	41.087
3	1.061	8.843	56.521	1.061	8.843	56.521	1.852	15.434	56.521
4	.916	7.630	64.152						
5	.745	6.205	70.357						
6	.684	5.697	76.054						
7	.614	5.120	81.174						
8	.567	4.725	85.899						
9	.489	4.079	89.978						
10	.455	3.792	93.770						
11	.389	3.239	97.009						
12	.359	2.991	100.00						

To get a picture of the factor structure of school climate scale, factor analysis (EFA) was done to decide the factor structure and to test the dimensionality of the initial form of the school climate scale. From table 2, it can be seen that there are three factors with eigen value above one. These three factors constitute a total variance of 56.52% (Factor 1=23.23%, Factor 2=17.85% and Factor 3=15.43%). The result of varimax rotation presented in table 3 revealed that items were clustered in components (factors) either in one, two or three. The criteria for selecting an item were those items which have a factor loading 0.45 or above can include in the final scale. Item number 1, 4, 7 and 16 loaded under component 1 with a factor loading above 0.6; items 5, 8, 11, and 14 loaded under component (factor) 2 with a factor loading above 0.5. Under component (factor) 3, there were items 3, 9, 12 and 18 and all items were having factor loading above 0.45. Hence, the investigator decided to keep all the 12 items in the final scale.

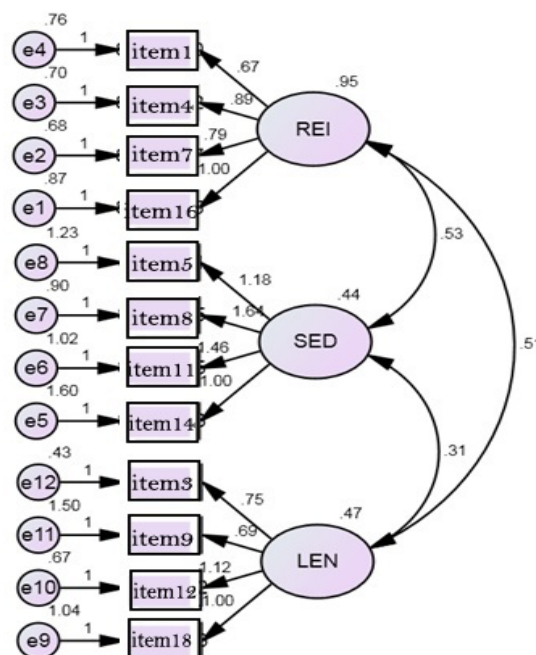
Table 3: Rotated component matrix-School climate

Items	Component (factor)		
	1	2	3
Item 4	.822	.092	.131
Item 1	.696	.109	.168
Item 7	.674	.227	.208
Item 16	.642	.235	.321
Item 14	-.083	.782	.239
Item 5	.256	.665	-.019
Item 11	.499	.596	.023
Item 8	.487	.590	.102
Item 9	.036	-.038	.725
Item 18	.268	.046	.722
Item 12	.287	.328	.555
Item 3	.221	.383	.487

From the results it is evident that the three major factors are well estimated by the obtained loadings. That means these items are measuring three dimensions of school climate and are named as 1) Relationship and interaction, 2) Security and discipline and 3) Learning environment. The description of each dimension is as follows.

1. Relationships and interaction: It encompasses positive teacher-student relationships, mutual respect, involvement, group morale and connectedness.
2. Security and discipline: This includes all of the rules, regulations, norms related to physical, social and emotional safety.
3. Learning Environment: It consists of varied teaching and learning method, exposure to various academic resources, equal opportunities for participation and, shared decision making.

To test the three-factor model of school climate as relationships and interaction, security and discipline, and learning environment as first order factor, confirmatory factor analysis (CFA) was carried out and the results are presented in figure 1 and table 4. According to Hair et.al, (2009), the confirmatory factor analysis is a procedure that allows one to test how well the measured variables represent fewer constructs and prior specification of factors consistent with reality, thus enabling to confirm or reject a preconceived theory.

**Figure 1: Confirmatory Factor of School Climate Scale (3 - Factor Model)****Table 4: Goodness of fit indices for three factor structural equation model (SEM) of School climate scale**

Model	CMIN/DF	CFI	RMEA	GFI	RMR	IFI
Three factor	1.976	.940	.063	.940	.076	.941

(Note: CMIN=Relative chi-square, CFI= Comparative Fit Index, RMSEA=Root Mean Square Error Approximation, GFI=Goodness of Fit Index, RMR= Root Mean Square Residual, IFI= Incremental Fit Index)

From table 4, it can be seen that the overall model fit appears quite good. The relative chi-square also known as normed chi-square value was 1.976 (CMIN=100.762, df=51). The criterion for acceptance varies across researchers. Schumaker and Lomax (2004) prescribe an acceptable chi-square value below 5, but Ullman (2001) suggests that a value less than 2 is acceptable. While referring both arguments the chi-square value is acceptable for this scale. The other common index considered by researchers is Comparative Fit Index (CFI) which represents the extent to which the model on interest is better than the independence model. Byrne (1994) suggests that if the estimated CFI exceeds 0.93 then the model fit to the data. Here the CFI was 0.940 which exceeds the cut-off value. RMSEA was 0.063 below the 0.05 cut-off. The Goodness Fit Index (GFI) exceeds 0.90 (Byrne, 1994), RMR below 0.08 (Brown & Cudeck, 1993) and the Incremental Fit Index exceeds 0.90. All these fit indices indicate that the model was a good fit to the data.

Reordering of the items

In the draft scale there were 18 items, and these item numbers were used throughout in the analysis process like, item analysis, factor analysis and confirmatory factor analysis. The serial number of the items in the just identified model was not continuous; hence the items were re-numbered and arranged from item one (1) to twelve (12). The initial item number and newly assigned serial number (final item number) mean, sd, and variance of each item are presented in table 5.

Table 5: Initial item number, Final item number and descriptive statistics of each item in the School climate scale

Initial number	Final item number	N	Mean	S.D	Variance
Item 1	1	250	3.34	1.094	1.197
Item 5	2	250	3.47	1.360	1.848
Item 3	3	250	3.80	.839	.704
Item 4	4	250	3.59	1.206	1.455
Item 8	5	250	3.54	1.451	2.104
Item 9	6	250	3.23	1.314	1.727
Item 7	7	250	3.62	1.135	1.289
Item 11	8	250	3.04	1.408	1.982
Item 12	9	250	3.32	1.128	1.272
Item 16	10	250	3.40	1.353	1.831
Item 14	11	250	3.12	1.433	2.055
Item 18	12	250	3.48	1.235	1.525

Reliability and Validity

Reliability of the three dimensions as well as the total scale was estimated by the method of Cronbach Alpha and found to be 0.78 for the dimension of relationship and interaction, 0.72 for the dimension safety and discipline and 0.62 for the dimension learning environment. For the whole scale reliability was found to be .84. Since the scale was developed on the basis of sound theoretical framework and in cooperating suggestions from experts in the field, content validity for the scale is established.

Scoring

School climate scale is a five-point Liker scale with response category as Strongly Agree (5), Agree (4), Undecided (3), Disagree (2) and Strongly disagree (1). All the items in the scale are worded positively and scored 5 to 1. The sum of the all the items score constitute the School climate score of an individual subject. For calculating the dimensional wise score, the calculation is as follows:

Add score of items 1, 4, 7, and 10 = Relationship and Interaction

Add score of items 2, 5, 8, and 11 = Safety and discipline

Add score of items 3, 6, 9, and 12 = Learning environment

Norms

Norms refers to the information regarding group performance of a particular reference on a particular measure for which a person can be compared to. A norm represents a typical level of performance for particular group percentile scores represent the percentage of persons in the standardised sample who fall below in a given raw score. This indicates an individual's relative position in the standardized sample. In case of percentiles, the counting begins from the bottom so lower the percentile, poorer the standing/rank. Here the investigator ha calculated norms for boys, girls and total sample. The details are presented in 6.

Table 6: Percentile norms for Male, Female, and Total Sample

Percentile	Scores Male	Female	Total
5	19.60	26.00	24.00
10	24.00	32.00	27.00
15	26.80	34.00	31.00
20	29.00	38.00	33.00
25	33.00	39.00	35.00

30	34.00	41.00	37.00
35	35.00	42.00	38.00
40	37.00	43.00	39.00
45	37.00	44.00	41.00
50	38.00	46.00	42.00
55	39.00	47.00	44.00
60	40.20	47.00	45.00
65	41.80	48.00	46.00
70	43.40	49.00	47.00
75	45.00	50.00	48.00
80	46.00	50.00	49.00
85	48.00	51.00	50.00
90	49.00	53.00	51.00
95	51.00	54.00	53.00

Table 7: School climate descriptive statistics for boys

Items	N	Minimum	Maximum	Mean	S. D	Variance
Item 1	111	1	5	3.17	1.151	1.325
Item 5	111	1	5	3.63	0.883	0.781
Item 3	111	1	5	3.35	1.277	1.630
Item 4	111	1	5	3.13	1.376	1.893
Item 8	111	1	5	3.29	1.171	1.371
Item 9	111	1	5	3.26	1.481	2.195
Item 7	111	1	5	2.86	1.374	1.888
Item 11	111	1	5	2.78	1.344	1.807
Item 12	111	1	5	3.12	1.102	1.213
Item 16	111	1	5	2.76	1.422	2.022
Item 14	111	1	5	3.18	1.428	2.040
Item 18	111	1	5	3.01	1.247	1.554

Table 8: School Climate descriptive statistics for girls

Items	N	Minimum	Maximum	Mean	S. D	Variance
Item 1	139	1	5	3.47	1.031	1.063
Item 5	139	2	5	3.94	0.778	0.605
Item 3	139	1	5	3.78	1.115	1.243
Item 4	139	1	5	3.74	1.287	1.657
Item 8	139	1	5	3.88	1.036	1.074
Item 9	139	1	5	3.77	1.390	1.932
Item 7	139	1	5	3.53	1.188	1.411
Item 11	139	1	5	3.24	1.429	2.041
Item 12	139	1	5	3.49	1.125	1.266
Item 16	139	1	5	3.40	1.382	1.909
Item 14	139	1	5	3.58	1.268	1.608
Item 18	139	1	5	3.85	1.090	1.187

CONCLUSION

School is the ideal place where the character of the students is tempered, where their perceptions about life are created and the purpose for the future is developed. The objective of this section of the study was to construct and standardize a scale to measure school climate in Malayalam language. The school climate scale has been constructed with 12 items with three dimensions, i.e., relationship and interaction, safety and discipline, and learning environment. This scale has possesses' psychometric properties also. This instrument may help the researcher to understanding the significance of different factors in school climate with specific reference to schools in Kerala. This instrument can be used a research instrument and also for diagnostic purpose.

CONFLICT OF INTERESTS: The author declared no conflict of interests

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