

THE EVALUATION OF SCHOOL CLIMATE: BUILDING AND VALIDATION
EVIDENCES OF MEASURING INSTRUMENTS FOR THE BRAZILIAN REALITY

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Abstract: This study aims at the construction and validation evidence analysis of two instruments on school climate. After looking for national and international research that addressed the construct school climate, we have developed a matrix with eight dimensions, considering the Brazilian reality. Therefore, two instruments were built, aimed at students and teachers in the upper grades of elementary school. Conducted content analysis by experts, an empirical analysis was made on a sample of 797 students and 243 teachers. The instruments showed good levels of reliability and confirmatory factor analysis indicated the appropriateness of items to different dimensions.

Keywords: School climate evaluation, construction and validation of instruments, Brazilian school reality.

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Introduction

The school climate concept is complex and as not to say: polysemic. After decades of studies, there is no consensus among researchers from different countries who study the subject. It is feasible to find terms like: ethos, atmosphere, ideology, community, personality, school social environment or yet, refer itself to school life. The scope of the studies ranges from the analyses on how the students feel in the institution, how they perceive the relations among school members towards aspects linked to educational experiences in different school environments, its site, and organization.

It is a challenging subject matter having key importance for the quality of education. Thus, as the school activities include relations and interactions with the environment, content, and among the ones who are present - teachers, administrators, workers and students – each one with their values, emotions, beliefs, needs, knowledge, and previous experiences, we face an - environment or atmosphere - that can be called: climate.

In regards to school, even with a multitude of concepts identified, the literature points out a rather common notion that conceives it as the perception that individuals have about the environment in which they live (Cunha & Costa, 2009; Gaziol, 1987; Janosz, 1998; Loukas, 2007; Thiébaud, 2005).

Considering this finding, we understand the school climate as a set of perceptions of the educational institution that usually unveils the factors related to the organization, the educational, and administrative structures, in addition to human relationships that occur at school. The climate corresponds to individual perceptions drawn from a common real context, therefore, constituted by subjective evaluations. It refers to the atmosphere of a school, that is, the quality of relationships and the knowledge developed, beyond values, attitudes, feelings and perceptions shared between teachers, students, management team, employees, and families. Consequently, there is a kind of "collective personality" of the institution, and each school has its own climate. Such atmosphere influences the quality of life and productivity of teachers, students and it allows to be aware of aspects of morality that permeate relationships at school.

The school climate is the result of the articulation of multiple dimensions that comprise structural elements, environmental, organizational, linguistic, social, and emotional. (Freiberg, 1998). According to Cohen et al (2009) researchers have deepened the search to outline how the school climate may be associated with relationship improvement within the institution. According to Thiébaud (2005, p. 01, our translation), "the school climate is related to the atmosphere present in social relations and values, attitudes, and feelings shared by the

ones on site." This way, the school climate refers to the quality of life and communication perceived by everyone at school. With regard to perceptions that members of school have noticed on how the ones are treated by others and the roles played in society to others. In the literature review conducted by the author, he exposes results of several studies, highlighting the sensitivity of students in relation to school climate, so forth influencing their behaviors. The author considers that school climate may be related to the level of effectiveness of an institution, mainly with the degree of incivilities, violence, and stress experienced.

In this regard, studies and researches developed within this subject have shown the way how individuals collectively notice this environment, brings significant influences on the group behavioral. A positive school climate is related to student academic achievement and violence reduction, for instance. (Janosz, 1998; Thiébaud, 2005; Cunha & Costa, 2009; Gomes, 2005; Gaziél, 1987).

Briefly, we can say that a positive school climate reveals good interpersonal relationships, quality on teaching/learning process, sense of justice in applying sanctions, opportunities for participation (the elaboration of rules is shared by everybody involved with the school), people feel safe and belonging to that educational environment (welcomed and involved).

Therefore, aiming at the quality of school life improvement, teaching and learning interactions, human relationships that occur on site - whether at school as a whole or in the classroom - the climate should be considered as the core of school planning towards supreme quality. States the diagnosis of reality lived and experienced by the members of the institution and it is the starting point for the changes that can implement strategies that promote a positive school climate. In this sense, according to Aquila et al (2009) there needs to be an innovative management, committed to the possibility of change; the enhancement of school members (students, parents, teachers, and administrators); the constant exercise of dialogue and collective work as well as the participation of family and community in institutional issues in order to enable the development of sociability and sense of belonging.

Measuring Instruments

There are several possibilities in which schools can evaluate the school climate. They may be, for instance, employed in: focus groups; observation methods; interviews; study circles; participatory-action researches; as well as polls with students, staff, and family members.

However, the school climate is further evaluated with investigations that are developed with methodological rigor and in addition to enabling the acknowledgement of the voice of school community members (students, teachers, administrators), it also evaluates all dimensions pertaining to social relations; the teaching/learning process, as well as experiences of educators and students at school (Cohen et al, 2009).

Climate Dimensions

The school climate comprises different dimensions that are always interrelated – social, organizational, pedagogical, disciplinary -having no single factor that can set the school climate by itself and its influence on students learning. Certainly, this matter leads us to the need for all these factors to be studied and considered in order to formulate the school climate. It is through the studies of differed dimensions that we enable a diagnostic evaluation of educational organization, so forth composing essential information for decision-making process that will make quality education possible.

The dimensions considered in the climate study are modified according to the objectives. There are different investigations that focus on partial aspects of the life of organizations, such as the social climate in which issues are addressed regarding the interactions between education members; the academic climate, considering the study of attitudes, values and expectations of individuals of the institution on education; and the organizational environment in which aspects are studied relating to interactions between administrators and teachers (Carvalho, 1992).

Freiberg (1998) highlights the complexity of multiple factors that are articulated in the formation of school climate. Even if there is evidence of one or another individual taking deeper looks on a given situation, no single dimension determines the climate of an educational institution. The mutual influence of factors, considering the institution as a whole and/ or their classrooms, can contribute to positive relations and the teaching/ learning process quality.

In accordance with Janosz (1998), the analysis of the school climate should be carried out taking into consideration the five interrelated angles, allowing us to understand a specific climate aspect. Such angles establish the sub-climates of school climate: relational climate, educational climate, safety climate, justice climate, and climate of belonging. It is therefore in the interrelation of different climates or dimensions that we are able to identify the climate of an educational institution.

Indeed, the investigations on school climate may bring contributions in order to analyze social standards interactions present in the educational context facilitating or hindering the collective work and dialogue between different academic professionals, key aspects in the educational dynamics (Brito & Costa, 2010). However, despite the relevance of this knowledge, there is not yet in Brazil, instruments validated and adapted to the reality of Brazilian schools that are able to measure school climate and hence, from a more accurate diagnosis, allowing the school to know its strengths and weaknesses for the planning of more effective intervention proposals.

Considering that this subject is little researched in Brazil, especially in regard to the lack of validated instruments adapted to the reality of our schools, this study aims at the construction and analysis of validation evidences based upon two instruments on school climate.

Methodological Procedures

In order to develop and test instruments to assess school climate for students from 7th to 9th grades and teachers of elementary school, the study went through the following steps: Review national and international literature for the preparation of the construct, the reference matrix, and the items that comprised the instruments; theoretical analysis of instruments features held by expert judges in the area; pilot application; empirical testing and investigation of construct validity. Such steps and results will be reported below.

The participants were students from 7th to 9th grades and teachers of elementary (EF) of public and private schools in the state of Sao Paulo, Brazil. In the pilot study, 6th graders of elementary school also participated.

The research was approved by Ethics in Research Committee of Unicamp (CAAE Number: 32973114.2.0000.5404).

Results

The assembling process of the instruments to assess school climate

Queries were held on national and international data bases for the assembling of questionnaires, seeking researches about the school climate as well as instruments used to evaluate it. Taking into account the literature review in the area and the analysis of various instruments from different countries, we assembled⁵ questionnaires for students and teachers.

⁵ These studies were conducted by the team that develops the research "Seeking ways to promote respectful coexistence in the classroom everyday," It is made up of researchers, post-graduation students and

Initially, a matrix assembled by eight interrelated dimensions was elaborated, considering School Climate features presented on Table 1.

Table 1 –School Climate Reference Matrix

School Climate Reference Matrix		
Dimension	Concept	Group
1. Relationship with teaching and with learning	Good quality of this dimension is based on the perception of school as a place of effective work with the knowledge that invests in success, motivation, participation and welfare of students, promoting the value of education and the meaning given to learning. It also implies the effective action in stable faculty and in the presence of different strategies that enhance learning for all and ongoing monitoring so that no student is left behind.	Students Teachers
2. Social relationships and conflicts at school	It refers to the relationships and conflicts between school members. The good quality of the relational climate is the result of positive relationships that occur in this environment, the opportunities for effective participation, the guarantee of welfare, respect and support among people, continually promoting the feeling of belonging.	Students Teachers
3. The rules, sanctions and security at school	This dimension is concerned on how managers, teachers, and students intervene on interpersonal conflicts at school. It also covers the design, content, legitimacy, and fairness in the application of rules and sanctions. In addition to order, justice, peace, and security in the school environment.	Students Teachers
4. The situations of bullying among students	This dimension deals with the identification of intimidation situations and abuse experienced in peer relationships and bullying, local incurring. Even to whom and how often the target happens, requesting assistance.	Students Teachers
5. Family, School, and Community	It refers to the quality of relations between school, family, and community, including the respect, trust, and support among them. It involves the feeling of being part of a group that shares common goals.	Students Teachers
6. The infrastructure of school	Quality of the school infrastructure and its environment, its use, organization, and care. Refers to as equipment, furniture, books, and materials are prepared and organized to favor the reception, free access, security, conviviality, and welfare in these atmospheres.	Students Teachers
7. Work relations	These are the feelings of managers and teachers with their work environment and educational institutions. Covers the perceptions linked to training and professional qualification, the practical studies and reflections on the actions, the valuation, satisfaction, and motivation for the role they	Teachers

undergraduates at Unicamp and Unesp. It obtained, at this particular stage, the aid finance from Lemann Foundation and Itaú BBA.

	play and the support they receive from managers and other professionals.	
8. Management and Participation	It covers the quality of the processes employed to identify the school's needs, intervention, and evaluation of results. It also includes the organization and coordination among various sectors and professionals that make up the school community in order to promote opportunities for participation and cooperation in pursuit of common goals.	Teachers

Source: Authors Elaboration

The development of items that composed the measuring instruments was based on the reference matrix, having the questionnaires composed of sections containing items that measure and evaluate the perceptions of individuals regarding these dimensions. There are four possible answers for each item presented in a Likert scale of four points. Alternative sequences came from increasing positions in order of importance given by the respondent the presented statement, for example: "I do not agree; I agree somewhat; I agree; I agree very much." Depending on the wording of the item, the alternatives measured themselves up to the command, such as: "Never; sometimes; often; always". At the end of each measuring instrument there are also issues aimed at gathering information on the profile of participants. The measuring instrument for students consisted of 171 items plus 22 profile issues and, for teachers, of 241 items plus 8 profile issues.

The instruments were then submitted to four experts in the field of interpersonal relations at school who did not know the items, and after such analyzes, improvement has taken place. This procedure, according to Pasquali (2003), refers to instrument content analysis to the extent that judges will point out whether the number of items included in the questionnaires is an appropriate representation of the latent trait (School Climate).

Then we conducted a pilot study with 80 students from 6th to 9th grades as well as EF teachers from public and private schools, after which the two questionnaires (students and teachers) were reanalyzed, adapting some terms of difficult understanding suggested by the students, adjusting the commanding issues, identifying the ratio (common items to both instruments), and at last, proceeding to the adequacy of the set of items to the reference matrix and to the revision of instruments.

Empirical testing of the instruments and first evidence of construct validity

It is extremely important to obtain the perception of school members – teachers and students of the same institution – in order to assess school climate. It is noteworthy that, in the case of validation process of the instruments, the questionnaires are still considered as the first

empirical testing. Accordingly, we proceed with the questionnaires of students (7th to 9th grades of EF) and teachers from public schools of Campinas, totaling 649 participants. The sample was intentional, as the institutions are located in the suburbs of the city. Table 2 shows the distribution details of the research participants in four participating schools.

Table 2–Data from participating school research

Participants	School 1	School2	School 3	School 4	Total
7 th grade Students	74	29	62	45	210
8 th grade Students	56	36	50	62	204
9 th grade Students	46	23	50	33	152
Total of students	176	88	162	140	566
Professors - EF1	0	9	12	14	35
Professors - EF1	17	6	9	16	48
Total of professors	17	15	21	30	83

Source: Authors elaboration

From the data collected in the above sample, we conducted statistical analyzes identifying the perceptions of the two groups on each dimension of school climate and the items that constitute it and proceeded to the schools, which analyzed and discussed the data. This way, verification and discussion were also performed in order to check if the tools "identified" what participants perceived at school. Such procedure was extremely important as it enabled the definition of schools as Criterion Group (evidence of validity) and we were able to verify whether the data collected indicated the reality lived in each participating research institution, obtaining positive results. Therefore, we further proceeded to the investigation of other evidence of construct validity of the instruments. According to Pasquali (2003), different techniques can be used for this purpose, in this study we chose to work with the analysis of the construct representation by the test applied under the perspective of internal consistency and factor analysis. To this end, we see the need to broaden our database by expanding our sample to 243 teachers and 797 students. Note that at this time, high school students were also onboard.

The internal consistency of the instruments of school climate for students and teachers was tested using the *Cronbach's* alpha. For the students sample, alpha values ranged from 0.659 (Dimension7: Situations of bullying among students) to 0.838 (Dimension 6: The School infrastructure and environment); in teacher sample values were 0.708 (Dimension 6: The School infrastructure and environment) up to 0.862 (Dimension 3: Work Relations)

indicating overall, good internal consistency index for the questionnaires. Whereas the acceptable value of the alpha coefficient is 0.70, and preferred values are between 0.80 and 0.90 (Streiner, 2003). We could observe from the processing performed that despite the high number of items by dimension, there is adequate internal consistency for most dimensions in the two groups investigated.

In order to test the hypothesis of theoretical factor composition of school climate questionnaires, we used the structural equation modeling for latent variables, Wald tests, and Lagrange to review the factor structure. The significance level adopted for the statistical tests was 5%, i.e.: $P < 0.05$.

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.

The procedure of this analysis is based on the composite model of fixed parameters (loading factors equal to zero) and free parameters to be estimated (loading factors different from zero) and statistics are calculated to test the suitability of setting the data in the sample model (goodness of fit statistics). In order to analyze the quality of data setting to the proposed factors, tests of significance to the loading factor were also made (t values > 1.96 indicate that the item has a significant burden within the factor). In order to propose changes in the factors, by excluding some items of certain factors, Wald test was used, checking how much the removal of a particular item influences in reducing the statistic chi-square of the model. If this is not an ultimate change, the removal of the item can take place. Another test conducted was the Lagrange multiplier that defines the need for reallocation from one item to another factor in order to improve the correlation among the items within the same factor. Similarly to the Wald test, it shows how much there will be of change in statistic chi-square when this item relocates to the new factor.

Along the testing of factor composition of school climate range of students in 8 factors, it was found that some adjustment suitability criteria obtained acceptance value of the proposed theoretical model, after deletion and reallocation of some items, and in regards to the estimation of the loading factors was found that most of the items showed a significant load on the respective factor (Table 1).

Table 1.

Estimation of loading factor by confirmatory factor analysis of the school climate range of students

Factor		T	Factor		T	Factor		T	Factor		T	Factor		T
1	Load	Value	2	Load	Value	3	Load	Value	4	Load	Value	5	Load	Value
Item			Item			Item			Item			Item		
P1	0.358	3.55*	P21	0.452	7.00*	P5	0.452	5.78*	P108	0.479	5.72*	P94I	0.358	4.22*
P8	0.450	6.16*	P27	0.346	4.63*	P44	0.612	5.87*	P111I	0.155	2.24*	P126I	0.676	6.22*
P10	0.348	4.98*	P28	0.486	6.62*	P46I	0.434	6.57*	P151I	-0.453	-4.88*	P127I	0.808	6.85*
P7	0.520	6.58*	P29	0.352	4.76*	P83	0.487	6.06*	P152I	-0.654	-8.82*	P128I	0.812	7.01*
P9	0.298	4.26*	P31	0.508	6.87*	P84	0.591	6.65*	P154I	-0.390	-4.75*	P129I	0.707	5.48*
P14I	0.328	4.19*	P32I	0.229	2.75*	P85	0.662	8.80*	P160I	-0.542	-6.87*	P130I	0.683	5.54*
P15I	0.202	2.61*	P33	0.658	8.03*	P86	0.667	7.96*	P161I	-0.219	-2.80*	P131I	0.741	6.87*
P16I	0.177	2.76*	P34	0.512	6.54*	P87	0.755	8.51*	P162I	-0.485	-6.27*	P132I	0.482	5.41*
P18	0.486	4.31*	P37	0.405	4.72*	P90I	0.337	3.29*	P163	0.498	6.89*	P133I	0.446	4.62*
P20	0.442	4.61*	P38I	0.407	4.19*				P164I	-0.718	-9.01*			
P24	0.328	3.59*	P39I	0.298	3.40*									
P25	0.441	5.47*	P40	0.542	6.58*									
P26I	0.314	3.68*	P41	0.504	6.32*									
P45	0.592	5.78*	P42	0.245	3.54*									
P70	0.479	7.00*	P43	0.607	6.06*									
P150I	0.388	5.50*	P47I	0.427	6.01*									
P149I	0.373	5.02*	P49I	0.403	5.32*									
			P50I	0.403	4.63*									
			P51I	0.495	5.54*									
			P89	0.595	7.43*									

* Significant values of standardized item loads ($p < 0.05$) to values of $t > 1.96$.

Table1 (cont.).

Estimation of loading factor by confirmatory factor analysis of the school climate range of students

Factor		T	Factor		T	Factor		T
6	Load	Value	7	Load	Value	8	Load	Value
Item			Item			Item		
P59	0.327	4.37*	P63	0.689	8.27*	P22I	1.011	12.27*
P62	0.336	5.11*	P64	0.646	8.60*			
P75	0.679	8.25*	P68	0.663	8.67*			
P76	0.354	4.76*	P69	0.614	9.17*			
P78	0.523	7.30*	P71	0.571	7.40*			
P77	0.395	5.33*	P73	0.606	8.00*			
P81	0.407	5.65*	P74	0.681	8.88*			

* Significant values of standardized item loads ($p < 0.05$) to values of $t > 1.96$.

Testing the hypothesis of the factor composition of the school climate scale of teachers in 9 factors, there was also some adjustment suitability criteria achieved value for acceptance of the proposed theoretical model, after deletion and relocation of some items. By estimating the loading factor, it was noted that several items presented importance on the relevant factor (Table 2).

Table2.

Estimation of loading factor by confirmatory factor analysis of the school climate range of teachers

Factor		T	Factor		T	Factor		T	Factor		T	Factor		T
1	Load	Value	2	Load	Value	3	Load	Value	4	Load	Value	5	Load	Value
Item			Item			Item			Item			Item		
P1	0.395	6.05*	P65	0.622	10.36*	P126	0.631	10.45*	P206	0.650	10.61*	P236I	-0.405	-5.03*
P2	0.423	6.52*	P69	0.532	8.57*	P155	0.305	4.66*	P214I	0.475	7.34*	P27	0.608	6.27*

P4	0.442	6.87*	P70	0.541	8.74*	P198	0.390	6.03*	P231I	-0.460	-7.08*
P5	0.482	7.56*	P72	0.474	7.50*	P199I	0.324	4.96*	P232I	0.399	6.07*
P7	0.409	6.29*	P73	0.721	12.55*	P201	0.585	9.54*	P235	0.677	11.16*
P11	0.471	7.37*	P84	0.481	7.63*	P202	0.440	6.89*	P237I	-0.424	-6.48*
P12	0.394	6.04*	P123	0.583	9.55*	P209	0.591	9.66*			
P14	0.432	6.68*	P128	0.411	6.39*	P213I	0.449	7.04*			
P21	0.465	7.26*	P129I	0.524	8.42*	P215I	0.458	7.20*			
P23	0.532	8.48*	P134I	0.376	5.81*						
P24	0.342	5.19*	P135I	0.336	5.15*						
P25	0.380	5.81*	P136	0.508	8.12*						
P28	0.614	10.07*	P146I	0.405	6.29*						
P29	0.465	7.27*	P147I	0.358	5.51*						
P30	0.625	10.32*	P208I	0.458	7.21*						
P33	0.241	3.60*	P210I	0.380	5.87*						
P34	0.332	5.03*									
P35	0.548	8.78*									
P36	0.456	7.09*									
P38	0.413	6.36*									
P41I	0.463	7.23*									
P43I	0.327	4.94*									
P44	0.417	6.43*									
P94	0.506	8.00*									
P105I	0.134	1.97*									

* Significant values of standardized item loads ($p < 0.05$) to values of $t > 1.96$.

Table2 (cont.).

Estimation of loading factor by confirmatory factor analysis of the school climate range of teachers

Factor		T	Factor		T	Factor		T	Factor		T
6	Load	Value	7	Load	Value	8	Load	Value	9	Load	Value
Item			Item			Item			Item		
P71	0.451	6.94*	P162	0.711	11.09*	P59	0.614	10.29*	P89	0.390	6.01*
P154	0.403	6.12*	P163	0.645	9.87*	P64	0.384	6.00*	P91	0.752	13.26*
P156	0.159	2.33*	P165	0.650	9.95*	P74	0.745	13.26*	P95	0.713	12.32*
P176	0.565	9.00*	P169	0.423	6.08*	P75I	0.355	5.51*	P98	0.706	12.16*
P177	0.678	11.32*	P173	0.530	7.83*	P77	0.688	11.91*	P99	0.724	12.58*
P178	0.648	10.67*	P175I	0.222	3.08*	P79I	0.210	3.19*	P100	0.625	10.37*
P179	0.725	12.38*				P80	0.853	16.23*	P103I	0.483	7.62*
P181	0.440	6.75*				P86I	0.279	4.27*	P104	0.473	7.45*
P182	0.493	7.68*				P87	0.508	8.20*	P106	0.639	10.67*
P183	0.501	7.81*				P88	0.484	7.77*	P108	0.338	5.15*
P184	0.568	9.07*				P90	0.654	11.15*	P109	0.404	6.24*
P185	0.556	8.83*				P92	0.564	9.28*			
						P101	0.694	12.05*			

* Significant values of standardized item loads ($p < 0.05$) to values of $t > 1.96$.

The results presented through the internal consistency analysis and AFC one, allowed to assert that these instruments show first evidence of validity. Giving continuity, we are proceeding with the next stages of the validation process involving the restructuring of the instruments, with the removal and overhaul of some of its items; new analysis of judges to investigate the validity of the content; second empirical testing as well as rechecking of reliability and construct validity.

Final overview

Although widely discussed in other countries, the school climate is still little studied in Brazil. Teachers and administrators are unaware of the dimensions that comprise the climate and its influence at school.

Our tasks carried out so far were able to identify different concepts on the subject. We have noticed that the surveyed references have the idea of school climate in common with the perception of individuals about the environment and it has demonstrated the way on how individuals collectively become aware of this atmosphere brings important influences on the behavior of groups, suggesting its association mainly to quality of learning and interpersonal relations at school. An assessment of the school climate allows each individual to express how they feel at their school; provides a "snapshot" of the socio-educational environment from a set of perceptions of all members of the institution, without narrowing down; promotes an acknowledgment of what is happening (strengths and weaknesses); demonstrates that everyone's opinion is important, encouraging them to express it; eases the choice of areas in which the school wants to aim future actions; mobilizes people to develop projects within the establishment and provides an ongoing evaluation or one after a process of transformation takes place in the institution (Thiébaud, 2005).

To this conclusion, we must have validated instruments to measure school climate. There is still a long way to go towards the achievement of useful and effective tools in order to enable them for the schools to diagnose its strengths and weaknesses. Thus, the school will focus on quality of education to everyone, considering that welfare at school is imperative for all its members.

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