

## Validity and Reliability of the School's Emotional Climate Scale

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### ABSTRACT

The aim of this study is to develop and validate the School's Emotional Climate scale. To this end, 683 teachers working in elementary and middle schools were recruited. An item pool with 39 items was created based on an extensive literature review and expert opinions. The items were reviewed by experts and seven items were dropped out from the item pool. EFA was conducted with 32 items. Based on the results of EFA, thirteen items were removed, which left 19 items with three factors. In order to test this structure, CFA was conducted. According to the CFA results, the scale was found to be reliable, which is also proved through Cronbach alpha reliability coefficient values. The final form of the scale consisted of 19 items with three factors entitles as emotional association, empathy, and emotional fatigue. The limitations and suggestions for future research is discussed.

### INTRODUCTION

There exist many emotions for human beings to experience in and out of work and they are indispensable of life and determinant of behaviors (Erkuş & Günlü, 2008). Work life, which encourage people to socialize, also brings love, anger, fear, happiness and so on (Seçer, 2005). Emotions need be managed carefully since they can have a positive or negative effects on life (Akin, 2004; Kervancı, 2008). More specifically, emotions are social structures that may destroy or improve the institution (Fineman, 1993). Since employees' emotions are the factors that affect the emotional climate of an organization, those emotions need to be managed carefully (Kervancı, 2008).

Emotional climate is the common emotional arousal situation created by a community (Tobin, Ritchie, Oakley, Mergrad & Hudson, 2013). Emotional climate, the common feelings that emerge as a result of the interaction among employees (De Rivera & Paez, 2007), is affected by many events that affect employees (Ruiz, 2007). Depending on whether the effect is positive or negative, the emotional climate is called a positive or negative emotional climate. While there is a common happiness and joy in a positive emotional climate, there is a common sadness, fear or anger in a negative emotional climate (Tobin et al., 2013; Turner, 2007). Negative emotions, if felt often in organizations, cause organizations to wear out. Therefore, it is critical for organizations to provide emotional climate-related training

programs for individuals or groups working in the organization (Kirel, 2007).

Work life cannot be isolated from emotions (Akçay & Çoruk, 2012). Especially in institutions whose input, output, and control mechanism that directs this process are human, it is even more important that emotions are experienced in a controlled way. The emphasis on information in education should be given to emotions as well (Zembylas, 2005) since emotions affect the climate of classrooms (Schutz, Aultman and Williams-Johnson, 2009) and positive climate increases learners' motivation, academic performance, and learning competence (Bellocchi, Ritchie, Tobin, Sandhu, & Sandhu, 2013). Briefly, positive school climate ensures the development of youth and encourage them to produce and contribute (Thapa, Cohen, Guffrey & Higgins-D'Alessandro, 2013). In addition, positive development of school environment increases the positive emotional interactions among school stakeholders. Hargreaves (2000) put strong emphasis on the emotional bond between the teacher and the student and stated that the stronger this bond, the better the quality of education will increase.

A positive emotional climate in organizations motivates employees and is effective in increasing their performance and commitment to their organizations (Akçay & Çoruk, 2012). In addition, managers' efforts to create a positive emotional climate also improve employees' commitment to their duties by developing an effort in this direction (Kahn,

1993) and highlight the vision of employees (Edmondson, 1999). Therefore, it is of great importance to measure the level of emotional climate that occurs in the educational institutions where the future of the society is shaped and take actions to increase the level of positive climate. In the literature, although there exist various scales that measure emotional climate (Liu, Härtel & Sun, 2014; Yurtsever & De Rivera, 2010), none is suitable to measure emotional climate in schools. This study aims to develop and validate the School's Emotional Climate scale.

## METHOD

### Participants

In order to select the participants, stratified sampling technique was employed. The participants consisted of 683 teachers working in primary and secondary schools in five different education districts with different socio-economic and cultural characteristics in a city located in the eastern part of Turkey during 2018-2019 school year. Through stratified sampling, the sample consisted of participants that is reflective of the larger population and the results have a higher statistical accuracy (Güneş & Arıkan, 1988).

In the literature, there exist various criteria for sample selection in regard to scale development studies. While Maccallum and colleagues (2001) mentioned the ratio 4:1 based on the number of items in the selected questionnaire, other researchers reported ratio of 5:1 or 10:1 (Tavşancıl, 2002; Büyüköztürk, 2018; Kurnaz & Yiğit, 2010). Also, Guilford (1954) stated that there should be at least 200 participants in the scale development studies. Moreover, Comrey and Lee (2013) and De Vellis (2014) rated the number of samples and considered 200 participants as moderate, 300 as good, and 1000 as excellent. Besides all these, Çokluk, Şekercioğlu and Büyüköztürk (2018) stated that even when developing a 10-item scale, at least 300 participants need to be reached. In addition, for the Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to validate a scale, it is critical to obtain data from two different sample groups (Fabrigar, Wegener, MacCallum and Strahan, 1999). Therefore, in the current study two sample groups (336 participants for EFA and 347 participants for CFA) were recruited.

There were 316 male and 367 female participants in the study. While there were 351 elementary school teachers, the rest was middle school teachers from various branches. With regard to teaching experience 15 teachers (2%) had less than one-year experience, 60 (9%) had 1-5 years of experience, 82 (12%) had 6-10 years of experience, 129 (19%) had 11-15 years of experience, and 397 (58%) had more than 16 years of experience.

### Data Collection Tool

In order to develop the School's Emotional Climate scale (SEC-S), an extensive literature review was conducted and similar studies were identified (Yurtsever and De Rivera, 2010; Liu, Härtel and Sun, 2014). Based on these studies

and expert views, a pool consisting of 39 items related to employees' emotional coexistence, emotional exhaustion and emotional interaction between the school administration and the teachers were formed. In terms of content validity, the items were reviewed by six experts from the Department of Educational Management, two experts from the Department of Education Programs, one expert from the Department of Computer Science and Instructional Technologies, and one expert from the Department of Turkish Education. In regard to expert views', three items were re-constructed and seven items were dropped out from the item pool, which left 32 items in total. The final draft of the SEC-S was reviewed by an expert from the Department of Turkish Education in terms of its language and grammar. The items in the scale were organized according to five-point Likert type scale with potential responses of strongly disagree, disagree, neutral, agree, and strongly agree.

### Procedure

After constructing the scale, the required permissions from the Ministry of Education was obtained. The data collection process took about three months during the spring semester of 2018-2019 school year. Each school was visited by the researchers and the study was introduced to the participants individually during weekday time. The printed version of the scale was delivered to the participants. It took approximately 10 minutes for participants to fill out the scale. After the data collection process, all data was transformed into an electronic format for analysis.

### Data Analysis

To ensure the construct validity of the scale, first, EFA was performed, and then, this structure was tested through CFA. In EFA, similar variables are collected under the same factor by using the relationship among the items and different factors are formed in itself. In CFA, this structure is statistically tested and verified (Büyüköztürk, 2018; Tabachnick & Fidell, 2007). In order to test the reliability of the scale, the internal consistency coefficient of Cronbach Alpha was used. For EFA and CFA, 336 and 347 cases were used, respectively. Then, in order to calculate Cronbach Alpha value, all cases were combined together ( $n = 683$ ). Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett Sphericity Test were used to test the suitability of the data for factor analysis. A computer-based statistics program was used for all data analysis.

## FINDINGS

### Results of Exploratory Factor Analysis

For the construct validity of the School's Emotional Climate Scale, first, exploratory factor analysis was conducted. The negatively worded items 14, 15, 16, 21, 23, 27, 30, and 31 were reverse coded. Then, KMO and Bartlett tests were performed to test the suitability of the data for factor analysis. In order for a scale to be ready for EFA, KMO value needs to be higher than .60 and Bartlett Sphericity test result

needs to be significant ( $p < .01$ ) (Büyüköztürk, 2018). The results revealed that the data was suitable for factor analysis (KMO: 0.902; Bartlett's Test of Sphericity: 3535.046,  $p=0.000$ ). Varimax (25) rotation technique was used for the extraction of factors. In EFA, each factor loading needs to be higher than .30 in order for an item to remain in the scale (Büyüköztürk, 2002; Field, 2009; Pallant, 2013) and the difference between item loadings for cross loaded items is not less than .1 (Costello & Osborne, 2005).

During the first stage of the factor analysis, items 5, 13, 18, and 19 were removed from the scale since their loadings were less than .30, and then, the analyses was repeated. In the second round, items 22, 23, and 27 were cross loaded and the difference between loading values were less than .1 and loading values of item 26, 31, and 32 were less than .30. Therefore, these six items were dropped out from the analysis. In the third round, items 6, 24, and 25 were removed from the scale because their loadings were less than .30, which left 19 items with three factors in the scale. Based on the factors, the items were re-numbered. Item loadings and factors are given in Table 1 and the scree plot is shown in Figure 1.

Generally, the factor loading values in the literature were expected to be higher than .20 (Şencan, 2005), .40 (Costello & Osborne, 2005; Tabachnick & Fidell, 2007), .45 (Büyüköztürk, 2018) or .50 (Thompson, 2004). In this study, the lowest item factor loading was .48, which implies that all item loadings were met the criterion. The obtained factors were entitled as Emotional Association, Empathy, and Emotional Fatigue. The emotional association factor consisted of 10 items with factor loadings ranging between .480 and .740 and explains 40.175% of the total variance; the empathy factor consisted of four items with factor loadings ranging between .665 and .878 and explains 11.882% of the total variance; and the emotional fatigue factor consisted of five items with factor loadings ranging between .515 and .865 and explains 7.263% of the total variance. Altogether, three factors explain 59.319% of the total variance.

After obtaining EFA results, a correlation matrix was created in order to examine the correlations between the factors of the scale (Table 2). Although the results demonstrated positive and significant correlations between the factors, the highest correlation was observed between the emotional association and empathy factors.

**Results of Confirmatory Factor Analysis**

In order to test the accuracy of the EFA results, CFA was conducted. The scale was administered to 347 participants who did not participate in the first stage of the study in which data was collected for EFA. The chi-square to degrees of freedom ratio ( $284.906/146 = 1.951$ ) was found after the generated model. In general, values below 2 are considered to indicate a good fit. Also, other values obtained from the analysis were proof of good agreement (CFI = .960, NFI = .921, GFI = .917, SRMS = .043, RMSEA = .052). The results and the reference values are given in Table 3

Sources: (Çokluk, Şekercioğlu & Büyüköztürk, 2018; Sümer, 2000; Tabachnick & Fidell, 2007; Schermelleh-Engel, Moosbrugger & Müller, 2003; Bentler, 1980; Marsh,

Hau, Artelt, Baumart & Peschar, 2006; Browne & Cudeck, 1993; Byrne 2001)

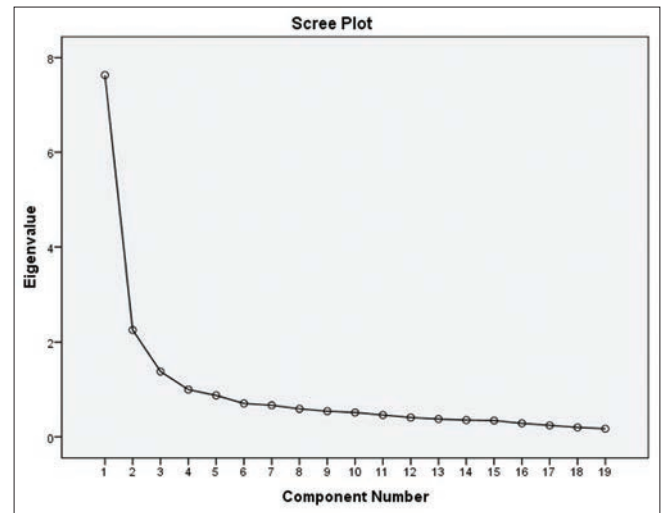


Figure 1. SEC-S Eigenvalue line graph

Table 1. SEC-S Item Loadings and Factors

Item number	Factor 1	Factor 2	Factor 3
6	.740		
5	.728		
10	.722		
17	.718		
7	.713		
15	.704		
8	.657		
18	.647		
9	.634		
14	.480		
2		.878	
3		.802	
1		.780	
4		.665	
12			.865
13			.812
11			.802
16			.614
			.515
Eigenvalue	7.633	2.257	1.380
Total	11.270		

Table 2. Correlation matrix of the three factors

Factors	1	2	3	Mean	Std. Deviation
1 - Emotional Association	1			3.7055	.63299
2 - Empathy	.649**	1		3.5251	.76134
3 - Emotional Fatigue	.411**	.305**	1	3.6349	.77344

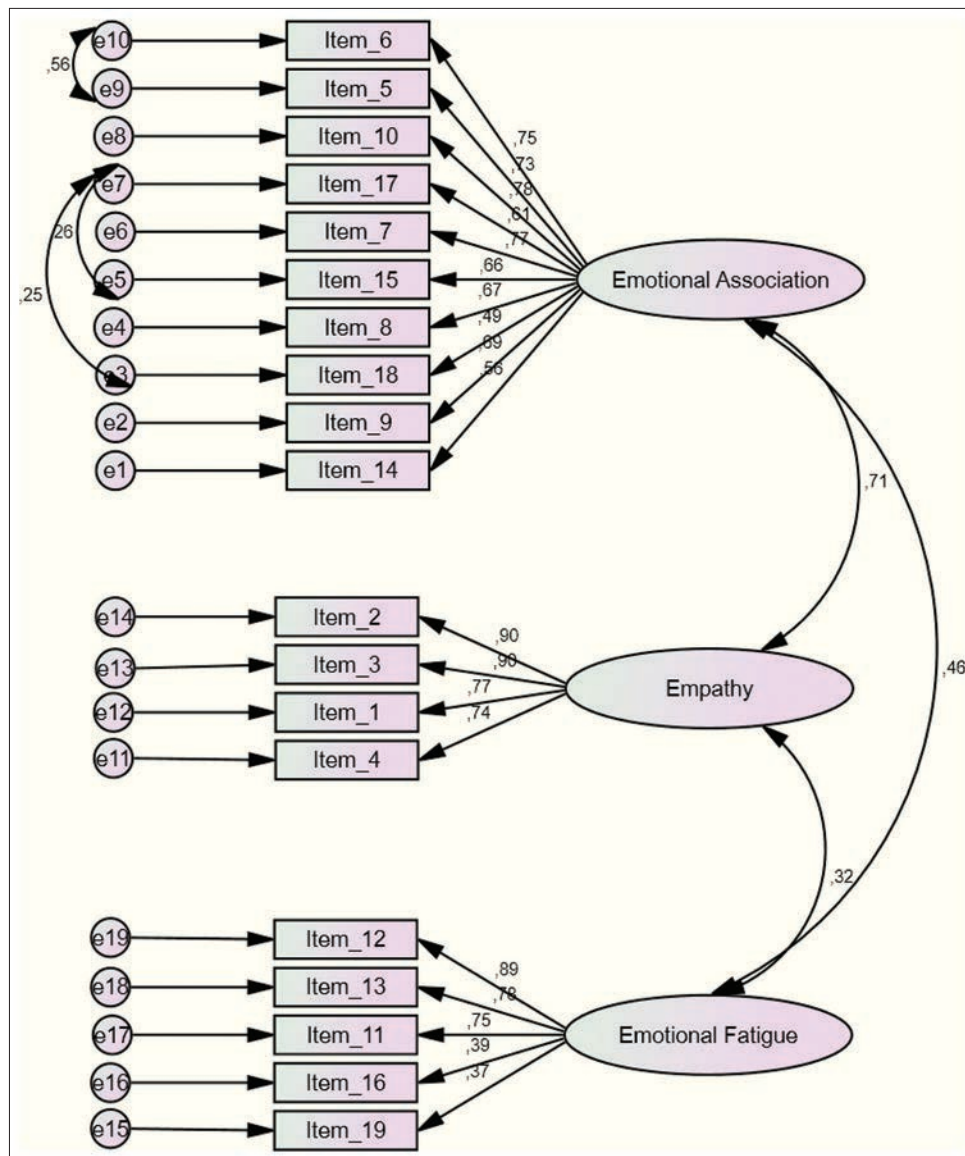


Figure 2. The final model and values

Table 3. The results of testing the overall model fit and recommended values

Notation	Perfect fit values	Recommended value	Calculated value	Result
X <sup>2</sup> /sd	0 ≤ X <sup>2</sup> /sd ≤ 2	2 ≤ X <sup>2</sup> /sd ≤ 3	1.951	Perfect fit
GFI	.95 ≤ GFI ≤ 1.00	.90 ≤ GFI ≤ .95	.917	Acceptable fit
CFI	.97 ≤ CFI ≤ 1.00	.95 ≤ CFI ≤ .97	.960	Acceptable fit
NFI	.95 ≤ NFI ≤ 1.00	.90 ≤ NFI ≤ .95	.921	Acceptable fit
RMSEA	.00 ≤ RMSEA ≤ .05	.05 ≤ RMSEA ≤ .08	.052	Acceptable fit

According to the CFA results, the factor loadings of the items under the emotional association dimension were .751, .727, .778, .613, .774, .662, .674, .491, .688 and .555; the factor loadings of the items under the empathy dimension were .904, .904, .768 and .739; and the factor loadings of the items under the emotional fatigue dimension were .892, .785, .752, .386 and .372 respectively. Three covariance paths were added between items 7 and 8, items 20 and 28, and items 28 and 29. The final model is presented in Figure 2.

**Reliability**

Cronbach alpha reliability coefficient was calculated in order to ensure the reliability of SEC-S. According to the literature, scales with reliability coefficient values higher than .70 are considered as reliable (Domino & Domino, 2006; Fraenkel, Wallen & Hyun, 2011). The reliability coefficient values for the emotional association, empathy, and emotional fatigue were calculated as .896, .884, and .782, respectively. In

**Table 4.** Cronbach alpha values of SEC-S

Factors	Cronbach alfa katsayısı
Emotional association	.896
Empathy	.884
Emotional fatigue	.782
Total	.905

addition, the total item reliability coefficient of the scale was found to be .905. The results revealed that the scale itself and its factors were reliable. The results are presented in Table 4.

## CONCLUSION

The presence of a person brings with it emotions. In the literature, there exist many scales to measure, specifically in work life, the emotional climate created by the emotional interactions among people. However, in the literature, there is no scale to measure the emotional climate in schools which are the most important centers of education. This study aims to fill the gap in the literature. In this respect, this particular study was conducted to develop the School's Emotional Climate Scale. The sample of the study consisted of 683 teachers serving in primary and secondary schools in a city located in the eastern part of Turkey during 2018-2019 school year. An item pool with 39 items was created based on the literature review and expert opinions. After the expert opinions, the final version of the scale with 32 items was constructed. It was a five-point Likert type scale ranging from strongly disagree to strongly agree. First, required permissions were obtained, and then, the scale was administered to 336 teachers.

Exploratory Factor Analysis was performed to provide evidence for structural validity over the data. As a result of the analysis, 13 items were excluded from the scale and the School's Emotional Climate Scale with 19 items and three factors was constructed. The factor loadings varied between .480 and .878. While Factor 1 explains 40.175% of total variance, Factor 2 and 3 explain 11.882% and 7.263% of total variance, respectively. All factors of the scale explained 59,319% of the total variance. The factors were entitled as Emotional Association, Empathy, and Emotional Fatigue.

In order to test the EFA results, the final scale was administered to 347 teachers who did not participate the first part of the study. CFA was employed and the chi-square to degrees of freedom ratio was calculated as 1.951. According to the ratio and the other values (CFI=.960, NFI=.921, GFI=.917, SRMS=.043, RMSEA=.052), the SEC-S was found reliable (Hair, Anderson, Tatham & Black, 1998; Kline, 2015; Raykov & Marcoulides, 2006; Baumgartner & Homburg, 1996). In the last stage of the study, both EFA and CFA data were combined to calculate Cronbach alpha reliability coefficient value for the factors and the scale itself. It was found that the reliability coefficient value was in acceptable range between .782 and .905, which is considered as an evidence for the scale to be reliable.

As a result, it is concluded that the School's Emotional Climate Scale is a valid and reliable scale. The scale can be used in the studies in order to determine the level of

emotional climate caused by the interactions among school staff. Future studies may use this scale to determine the association among schools' emotional climate and other variables including organizational commitment, organizational cynicism, job satisfaction, organizational support, and so on.

Although this study has good psychometric properties in terms of scale development, it has some limitations. First, the participants of the study consisted of 683 teachers serving in elementary and middle schools in a city located in eastern part of Turkey, which led to sample-specific results. Therefore, this may limit the generalization of the results for all population. A future replication of the study is suggested for future research with other rural and urban populations. Second, although two different samples were studied for both EFA and CFA, more research is needed for validation with larger as well as cross-cultural samples. The last limitation is that this study included only SEC-S. Future research must include other scales related to, for instance, organizational commitment, organizational cynicism, job satisfaction, and organizational support in order to determine whether there is any association between emotional climate of schools and other variables.

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