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Part I

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Construction and Validation of Emotional Intelligence Scale for Secondary School Teachers

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COSTRUZIONE E VALIDAZIONE DELLA SCALA DELL'INTELLIGENZA EMOTIVA PER GLI INSEGNANTI DELLE SCUOLE SECONDARIE

ABSTRACT

In this study, we developed and validated a new instrument: an emotional intelligence scale for teachers. This paper focused on the psychometric properties of the emotional intelligence scale for school teachers dealing with adolescent students. The study also validated the tool over 608 secondary school teachers in India. This scale was evaluated using exploratory factor analysis (EFA), confirmatory factor analysis (CFA), Cronbach's alpha, and item-total correlation. Results showed good fit ($\chi^2/df = 1085.66$, CFI = 0.956, GFI = 0.876, TLI = 0.951, PCFI = 0.860, PNFI = 0.843, RMSEA = 0.06 and SRMR = 0.056) for the five components (Self-Perception, Self-Regulation, Self-Drive, Empathy, Social Motive) of the measurement model. However, 80.18% of the total variance was explained by the factors Reliability (Cronbach alpha = 0.95) and construct validity means convert and discriminant validity was established for a teacher's innovative emotional intelligence scale. Finally, the robust findings indicated that the instrument could be used in further studies in different research areas.

Keywords: Emotional intelligence; Factor analysis; Psychometric properties; Teaching Experiences; Validation.

1. INTRODUCTION

Emotional intelligence is a fundamental psychological construct (Meyers, 2009) apart from different outcome-based variables (e.g., academic intelligence, academic achievement, creativity). Teachers' emotional intelligence is considered a very effective research area. According to Daniel Goleman (1995), emotional intelligence accounts for 80% of all success and general intelligence for the remaining 20%. Emotional intelligence helps improve teaching effectiveness, teaching role, motivation, personal well-being, teamwork, and leadership qualities (Mérida-López & Extremera, 2017) to establish their goals for professional life (Brockbank & McGill, 2007). Emotionally intelligent teachers' role is essential in students' learning, teacher students' relationship, learning environment, teaching and learning process, and academic achievement (Gallardo, Tan, & Gindidis, 2019). Although there are many contradictions in the components and measurements of Emotional intelligence (Zeidner & Matthews, 2017), another difficulty is the diversity of emotional intelligence models that can be used with various tools. Different scholars used the emotional intelligence inventory (Sala, 2002), questionnaire (Petrides, 2009), test (Brackett & Salovey, 2006), and survey (Wong & Law, 2002) for the same purpose.

As per the different models by different psychologists, emotional intelligence is a multidimensional construct. However, most of the existing standardized tools were prepared for measuring emotional intelligence in different targeted populations like the lawyer, the administrator, and students of different age groups. But teachers are the backbone of our society and have the potential to create a better future generation. It is essential to measure teachers' emotional intelligence to handle students properly during adolescence. An instrument to measure a teacher's emotional intelligence in the Indian context is crucial and essential. Unfortunately, some of the tools are prepared in other countries but not in India, especially in the context of school education. As per the different socio-cultural backgrounds, there is a necessity to prepare an emotional intelligence scale for teachers, which will, directly and indirectly, help the progress of our society. Therefore, this present study mainly deals with an existing research gap. Studies show an inconsistency in the definition, structure, and measurement of emotional intelligence. There aren't many studies that assess teachers' emotional intelligence. Eventually, there is a requirement to develop an emotional intelligence scale for teachers considering the construct as a regulatory mechanism for enhancing teachers' quality of their personal and professional life. Finally, such inconsistencies in the measuring emotional intelligence construct call for a (contextually appropriate quality measure-

ment of emotional intelligence construct) valid and reliable instrument that accurately measures teachers' emotional intelligence is essential, especially in the context of school education in India.

2. RESEARCH OBJECTIVES AND RESEARCH QUESTIONS (RQ)

Theorists generally agree that emotional intelligence is a multidimensional construct, although the number and nature of the dimensions are unclear. There is an inconsistency in measuring emotional intelligence construct per different national and international studies. The current study attempts to develop and standardize the emotional intelligence scale. So, the objectives of this study are: to know the factorial structure and measurement of the emotional intelligence scale. There is a massive conflict between conceptual and structural issues on emotional intelligence. That is why researchers developed an emotional intelligence scale for teachers. The study attempts factorial validity and reliability of the measurement scale. The main research questions (RQ) are:

- *Research question 1.* What is the factorial structure of the emotional intelligence scale?
- *Research question 2.* What are the psychometric properties of the emotional intelligence scale?

3. METHODS

3.1. *Participants of the study*

Data were collected from 608 secondary-level school teachers in West Bengal, India. Out of the 608 teachers, 316 were male (51.97%), and 292 were female (48.03%). Those teachers belonging to the less experienced group (up to 5 years) were 181 in number (29.77%), Medium experienced (5 years - 10 years) were 195 in number (32.07%), High experienced (> 10 years) were 232 in number (38.16%). Hence, All Secondary school teachers who teach in classes IX and X (around 608 teachers) of randomly selected 35 schools formed the study sample, as shown in *Table 1*. However, 35 respondents (0.057%) were removed as those secondary school teachers did not complete the general information and some items of the scale.

Table 1. – Participants profile.

DEMOGRAPHIC VARIABLES	SAMPLE WITH SPECIFICATIONS (608 PARTICIPANTS)	
	N	%
Gender		
Male	316	51.97
Female	292	48.03
Teaching experiences		
High experienced (> 10 years)	232	38.16
Medium experienced (5 years - 10 years)	195	32.07
Less experienced (up to 5 years)	181	29.77

3.2. Data collection procedures

The total samples are 608 secondary school teachers, from 35 randomly selected secondary schools, for validating the research tool. There were specific protocols maintained during data collection. First of all, the head of the institution of the selected schools was informed to get permission to collect data from that school. The authors adequately explained the purpose of this present study. Subsequently, due consent was procured from the participants for this purpose. After getting permission from the head of the institution/school, all the secondary teachers teaching in class-IX and class-X of each particular school were informed about the study. The researchers requested all the teachers teaching class-IX and class-X to respond to all the statements without hesitation and with the utmost honesty. Teachers were informed that their responses would be used solely for research, and would not be evaluated or disclosed. Then the emotional intelligence rating scale was given to all the teachers to be filled in. The secondary school teachers were asked to provide their responses on certain items that were prepared to check the teachers' emotional intelligence and some general/demographic information about them. All the sessions were executed in specific schools only under the researcher's supervision. However, the participants did not receive any incentives due to a lack of funding.

3.3. Item writing

After a thorough review of standardized published tools measuring emotional intelligence (Goleman, 1995; Mayer & Salovey, 1997; Bar-On,

2000; Petrides & Furnham, 2001; Goleman & Boyatzis, 2017), the stringing of items in the instruments was primarily prepared. The main reason behind that scale preparation was to collect the content coverage, varieties of items, and range measurement. So, various tools were reviewed irrespective of factorial structure and measurement mode (e.g., scale, inventory, test, questionnaire, and survey). First of all, 126 items on emotional intelligence were developed. A pre-planned repetitive process was followed to eliminate the items merely were the antecedents and consequences of emotional intelligence. After taking suggestions from a panel of experts, those items that only checked the emotional intelligence of different school situations, their relationship with students and colleagues, and general social situations were retained. Then, a set of 84 items were retained as the preliminary draft for the targeted tool regarding emotional intelligence. After getting these entire experts' viewpoints, the emotional intelligence tool was modified. Finally, a modified emotional intelligence scale draft with 84 items (32 negative items) was prepared, considering suggestions and feedback from the experts. This draft of the emotional intelligence scale was a five anchor points rating scale which started from «strongly disagree» to «strongly agree».

3.4. Pretest and pilot study

Pretesting was conducted using 84 items of a draft emotional intelligence scale for 35 secondary-level school teachers (Pernegeret *et al.*, 2015) teaching class IX and class X (Kumar, Talib, & Ramayah, 2013) for reducing measurement error (Blair & Conrad, 2011). The main reason behind pretesting was to check whether any of the items was ambiguous, not well sequenced, unclear in meaning (Sekaran, 2003), double-barreled and whether everything was instructed adequately to the participants (Kumar *et al.*, 2013).

The results showed low variability and skewness of scores from the mean score for 36 scale items. Those items were eliminated from the emotional intelligence scale. However, before calculating, the scores were reversed for negative items. Within this, 15 unambiguous and unclear items were deleted, and 11 were dropped for social desirability bias. Apart from these, 10 items were deleted due to common method biases. So, those items are eliminated are modified to make them appropriate for the pretest study.

Further, the final revised emotional intelligence scale with 48 items conducted a second round of pretesting (Memonet *et al.*, 2017) then it was

depicted that no further modification of items. Then a rating scale with 48 items (26 negative items) was obtained and rated by the secondary school teachers' viewpoints. Finally, this tool with 48 items was piloted (Polit *et al.*, 2001; Teijlingenet *et al.*, 2001) on another 30 teachers (Memon *et al.*, 2017). This is important to ensure its feasibility and adequacy (Teijlingen vanet *et al.*, 2001). Apart from this, a reliability analysis was also conducted for all the items. After getting the reliability analysis results, a satisfactory reliability analysis was depicted as the Cronbach alpha (α). Cronbach alpha value was set at 0.95, considering all the items under a single construct: emotional intelligence. This final result supported the modification one at the time of pretesting. After the final modification of items, a total of 28 items were considered as the final draft of emotional intelligence (18 items are negative). In further data analysis, the factorial structure of the emotional intelligence scale and the validity and reliability of the items were tested.

4. ANALYSIS STRATEGY

4.1. Preliminary analysis:

First of all, data were checked to determine whether the statistical analysis was fulfilled or not. After that statistical analysis. There was no missing value for 608 cases. Then, central tendency and variability were measured for the emotional intelligence scale. Skewness and kurtosis were calculated for every item to examine whether the data were associated with a normal probability curve. Results depicted that the values for all items were within a statistically acceptable range (kurtosis < 7 and skewness < 2; Curranet *et al.*, 1996).

4.2. Main analysis

Data analysis was performed using the Statistical package SPSS 26.0 (IBM Corp., Armonk, NY, US). There was a benchmark for all statistical comparisons 5% level of significance (α) was considered. A series of exploratory factor analyses (EFA) was conducted to explore the new dimensions of emotional intelligence.

Firstly, a zero-order 1-factor model was examined to the complete set of 28 items together and then loaded on a single factor. Next, 2-factor,

3-factor, and 4-factor models were tested, taking one out of the five factors (viz. Self-Perception, Self-Regulation, Self-Drive, Empathy, and Social Motive) as a distinct factor and combining the items of the rest of the factors. Finally, a first-order 5-factor model was examined. The 5 measurement models were compared based on model fit indices: χ^2 statistic and associated Parsimonious Normed Fit Index (PNFI), Parsimonious Comparative Fit Index (PCFI), Tucker Lewis Index (TLI), Comparative Fit Index (CFI), Goodness-of-Fit Index (GFI), p-value, Standardized Root-Mean-Square Residual (SRMR), Root Mean Square Error of Approximation (RMSEA). The threshold values for CFI, TLI, and GFI were $\geq .90$ (Bentler & Bonnet, 1980), $< .80$ for acceptable (MacCallum *et al.*, 1996), or $\geq .60$ (Hu & Bentler, 1999) and $\geq .50$ for PCFI and PNFI (James *et al.*, 1982) for a good fit. As a result, after EFA and CFA construct validity was determined. Besides, the mean scores of different dimensions of emotional intelligence were compared to evaluate whether the evaluation of the factors differed across gender and teaching experience. However, sample size highly influences the chi-square statistic and is considered an invalid parameter as a model-fit index. So, χ^2/df was calculated where values lower than 2 are considered acceptable (Levy & Marshall, 2004).

5. RESULTS AND DISCUSSION

5.1. Descriptive statistics

5.1.1. Item analysis

First, a descriptive analysis of the scores for 28 scale items rated on the 5-point Likert scale was executed. Subsequently, the mean and standard deviations ranged from 3.11 to 3.45 and from 1.046 to 1.290. Finally, reliability analysis was checked. Further, Cronbach's alpha (α) value for the overall scale was found to be .95, which implies a high value (De Vellis, 2003) of reliability coefficient (≥ 0.90). Another thing calculated was the standardized value (Z) of the skewness and kurtosis. According to Kline guideline (2005), no value of the scale item crossed the statistical threshold of the skewness (-3 to +3) and kurtosis (-10 to +10). The item-total scale correlation coefficients depicted that correlation of individual scale item with the overall scale were statistically significant for all 28 items, as shown in *Table 2*.

Table 2. – Mean, SD, skewness, and kurtosis of the 28 emotional intelligence scale items.

	N	MEAN	SD	SKEWNESS		KURTOSIS	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
SP1	608	3.34	1.046	-.214	.099	-.373	.198
SP2	608	3.31	1.099	-.283	.099	-.501	.198
SP3	608	3.35	1.060	-.307	.099	-.371	.198
SP4	608	3.32	1.104	-.343	.099	-.450	.198
SP5	608	3.31	1.062	-.338	.099	-.264	.198
SP6	608	3.42	1.066	-.689	.099	-.111	.198
SP7	608	3.45	1.056	-.742	.099	-.092	.198
SR1	608	3.29	1.157	-.321	.099	-.555	.198
SR2	608	3.25	1.104	-.038	.099	-.602	.198
SR3	608	3.24	1.111	-.077	.099	-.705	.198
SR4	608	3.22	1.101	-.207	.099	-.521	.198
SR5	608	3.21	1.093	-.151	.099	-.484	.198
SD1	608	3.14	1.239	-.147	.099	-.908	.198
SD2	608	3.14	1.284	-.342	.099	-.989	.198
SD3	608	3.16	1.269	-.336	.099	-1.003	.198
SD4	608	3.18	1.264	-.178	.099	-.942	.198
SD5	608	3.11	1.303	-.232	.099	-1.067	.198
EM1	608	3.29	1.069	-.346	.099	-.455	.198
EM2	608	3.24	1.113	-.344	.099	-.507	.198
EM3	608	3.26	1.109	-.421	.099	-.480	.198
EM4	608	3.37	1.151	-.635	.099	-.400	.198
EM5	608	3.46	1.160	-.642	.099	-.452	.198
SM1	608	3.37	1.257	-.596	.099	-.715	.198
SM2	608	3.38	1.261	-.452	.099	-.808	.198
SM3	608	3.38	1.259	-.675	.099	-.629	.198
SM4	608	3.34	1.226	-.523	.099	-.702	.198
SM5	608	3.45	1.289	-.568	.099	-.722	.198
SM6	608	3.44	1.290	-.541	.099	-.753	.198
Valid N (listwise)	608						

Note: SP = Self-Perception, SR = Self-Regulation, SD = Self-Drive, EM = Empathy, SM = Social Motive.

5.2. Development of the measurement model

5.2.1. RQ 1: What is the factorial structure of the emotional intelligence scale?

Varimax rotation and principal components analysis method was used for exploratory factor analysis to extract the components of the factor structure of emotional intelligence. The factors were considered those that Eigenvalues were greater than 1. Major things for conducting exploratory factor analysis (EFA) were examined. Kaiser-Meyer-Olkin; a measure of sample adequacy (0.952) was > 0.6 (Kaiser, 1974), and Bartlett's Sphericity Test ($\chi^2 = 1085.66$, $df = 340$, $p < .001$) was significant (Tobias & Carlson, 1969). The items were allocated to each scale dimension following their loading patterns. The five-factor model was developed with 28 items: Self-Perception (7 items), Self-Regulation (5 items), Self-Drive (5 items), Empathy (5 items), and Social Drive (6 items). Self-Perception (item no.: SP1 to SP7), Self-Regulation (item no.: SR8 to SR12), Self-Drive (item no.: SD13 to SD17), Empathy (item no.: EM18 to EM22), Social Drive (item no.: SM23 to SM28) (Tab. 2). Further, the non-zero determinant value of the correlation matrix fulfilled the criteria of positive definiteness. The main results of the EFA came up with a 5-factor solution. 80.17% were explained of the variance in the latent construct in total. The rotated component matrix showed that the standardized factor loadings for all the items on corresponding latent factors were more significant than $|.45|$ (Hair et al., 1998). So, the model is highly suitable or fitted.

The first sub-scale (Self-Perception) consisted of seven items and 19.44% of the total variance in emotional intelligence. Sample items include: «I become angry whenever a student commits a mistake, and I remain calm even under stress». The second factor, i.e. (Self-Regulation) consisted of another five items and 16.85% of the total variance in the construct. This factor included items such as «I do not bother about my colleagues' problems, and I always behave as per the situation». The third subscale (Self-Drive) consisted of five items and 15.49% of the total variance. Some items are: «I am fully committed to my work, and I feel uneasy working with my colleagues». The fourth subscale (Empathy) consisted of five items and 14.41% of the total variance. Some sample items are: «I always help others to make decisions whenever they need me, and I don't bother about others' problems». The fifth subscale (Social Drive) consisted of five items and 13.99% of the variance. Some sample items are: «I always enjoy working with my colleagues, and I do not share my

contacts easily». Finally, Cronbach's α value for Self-Perception, Self-Regulation, Self-Drive, Empathy, and Social Motive was 0.95, 0.94, 0.95, 0.93, 0.95, for the overall scale, indicating high reliability of the measurement scale. The rotated component matrix of the final 28 items is given in Table 3, and factor inter-correlation is given in Table 4.

Table 3. – Rotated component matrix: standardized factor loadings of 28 items in five dimensions of emotional intelligence construct.

ITEMS		FACTOR 1 (SP) (19.44%)	FACTOR 2 (SR) (16.85%)	FACTOR 3 (SD) (15.49%)	FACTOR 4 (EM) (14.41%)	FACTOR 5 (SM) (13.99%)
<i>Self-Perception items</i>						
q1	I am aware of my strengths and weaknesses.	.857				
q2	I try to learn from my mistakes.	.845				
q3	I become angry whenever a student commits a mistake.*	.844				
q4	I remain calm even under stress.*	.862				
q5	I remain enthusiastic about student progress.	.888				
q6	I avoid taking on challenging tasks.*	.830				
q7	I am unable to control my negative thoughts about my colleagues.*	.833				
<i>Self-Regulation items</i>						
q8	I balance my personal and professional life.					.737
q9	My anger goes beyond control in any disturbing situations.*					.807
q10	I often get diverted from my work.*					.802
q11	I do not bother about my colleagues' problems.*					.805
q12	I always behave as per the situation.					.760
<i>Self-Drive items</i>						
q13	I avoid others' opinions.*			.836		

ITEMS	FACTOR 1 (SP) (19.44%)	FACTOR 2 (SR) (16.85%)	FACTOR 3 (SD) (15.49%)	FACTOR 4 (EM) (14.41%)	FACTOR 5 (SM) (13.99%)
q14 When students commit a mistake, I criticize them in front of others.*			.858		
q15 I am fully committed to my work.			.870		
q16 I feel uneasy working with my colleagues.*			.863		
q17 I always motivate the students for their progress.			.814		
<i>Empathy items</i>					
q18 I don't have to solve students' problems.*				.749	
q19 I always help others to make decisions whenever they need me.				.765	
q20 I don't bother about others' problems.*				.805	
q21 I do not consider others' points of view.*				.831	
q22 I do not have extra time for the students beyond the classroom.*				.804	
<i>Social Motive items</i>					
q23 I am unable to build rapport with my colleagues.*		.809			
q24 I attend different social events despite my busy schedule.		.797			
q25 I don't like to be in contact with others.*		.802			
q26 I don't like the people who criticize me.*		.791			
q27 I always enjoy working together with my colleagues.		.815			
q28 I do not share my contacts easily.*		.826			

Note: * = negative items of the emotional intelligence scale.

SP = Self-Perception, SR = Self-Regulation, SD = Self-Drive, EM = Empathy, SM = Social Motive.

Table 4. – Inter-item correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	1.00																											
2	0.73	1.00																										
3	0.74	0.71	1.00																									
4	0.75	0.73	0.74	1.00																								
5	0.79	0.74	0.76	0.79	1.00																							
6	0.67	0.67	0.68	0.68	0.70	1.00																						
7	0.66	0.68	0.67	0.69	0.72	0.74	1.00																					
8	0.25	0.22	0.24	0.22	0.21	0.20	0.23	1.00																				
9	0.24	0.20	0.22	0.21	0.18	0.17	0.18	0.76	1.00																			
10	0.24	0.22	0.23	0.22	0.18	0.17	0.16	0.70	0.80	1.00																		
11	0.24	0.21	0.23	0.24	0.19	0.17	0.18	0.74	0.81	0.77	1.00																	
12	0.21	0.23	0.24	0.22	0.19	0.18	0.17	0.69	0.79	0.74	0.79	1.00																
13	0.17	0.16	0.16	0.19	0.16	0.11	0.17	0.57	0.61	0.56	0.61	0.62	1.00															
14	0.18	0.18	0.16	0.17	0.15	0.13	0.18	0.54	0.58	0.53	0.56	0.58	0.84	1.00														
15	0.15	0.16	0.12	0.15	0.12	0.09	0.14	0.54	0.55	0.51	0.53	0.56	0.83	0.82	1.00													
16	0.16	0.15	0.13	0.15	0.13	0.08	0.13	0.52	0.55	0.52	0.54	0.55	0.81	0.80	0.82	1.00												
17	0.20	0.21	0.18	0.21	0.20	0.16	0.20	0.50	0.53	0.48	0.49	0.50	0.75	0.77	0.75	0.76	1.00											
18	0.33	0.34	0.36	0.35	0.32	0.29	0.27	0.40	0.46	0.40	0.44	0.43	0.33	0.32	0.30	0.32	0.44	1.00										
19	0.31	0.32	0.35	0.34	0.33	0.29	0.29	0.37	0.41	0.37	0.39	0.40	0.27	0.30	0.26	0.25	0.41	0.71	1.00									
20	0.33	0.30	0.31	0.31	0.28	0.25	0.25	0.40	0.43	0.39	0.41	0.42	0.28	0.29	0.26	0.26	0.43	0.74	0.74	1.00								
21	0.25	0.26	0.26	0.26	0.24	0.24	0.23	0.36	0.39	0.34	0.37	0.36	0.26	0.29	0.26	0.25	0.41	0.72	0.71	0.75	1.00							
22	0.27	0.26	0.26	0.29	0.25	0.24	0.23	0.35	0.37	0.34	0.38	0.37	0.28	0.28	0.29	0.25	0.42	0.71	0.69	0.75	0.77	1.00						
23	0.24	0.26	0.29	0.28	0.29	0.24	0.25	0.39	0.43	0.39	0.43	0.42	0.31	0.28	0.28	0.27	0.40	0.59	0.57	0.59	0.57	0.59	1.00					
24	0.22	0.24	0.27	0.25	0.25	0.23	0.22	0.37	0.40	0.35	0.39	0.41	0.32	0.29	0.31	0.30	0.41	0.56	0.55	0.58	0.52	0.57	0.84	1.00				
25	0.27	0.29	0.36	0.31	0.31	0.35	0.28	0.39	0.38	0.36	0.38	0.40	0.29	0.25	0.25	0.25	0.31	0.47	0.46	0.48	0.45	0.50	0.75	0.72	1.00			
26	0.25	0.27	0.30	0.25	0.27	0.23	0.24	0.43	0.47	0.41	0.45	0.46	0.35	0.32	0.31	0.32	0.43	0.66	0.57	0.59	0.55	0.56	0.86	0.82	0.74	1.00		
27	0.19	0.20	0.27	0.23	0.21	0.21	0.20	0.44	0.52	0.47	0.54	0.55	0.37	0.32	0.29	0.29	0.33	0.50	0.49	0.49	0.46	0.45	0.76	0.71	0.72	0.77	1.00	
28	0.19	0.19	0.24	0.21	0.19	0.20	0.19	0.40	0.47	0.44	0.50	0.51	0.45	0.35	0.33	0.32	0.34	0.48	0.44	0.46	0.43	0.45	0.74	0.72	0.71	0.74	0.84	1.00

Table 5. – Factor inter-correlations of dimensions of the emotional intelligence scale.

	FACTOR INTER-CORRELATIONS				
	SP	SR	SD	EM	SM
SP	–				
SR	.27**	–			
SD	.20**	.67**	–		
EM	.37**	.49**	.38**	–	
SM	.32**	.54**	.39**	.66**	–

Note: ** = significant correlation at the 0.01 level (2-tailed).

SP = Self-Perception, SR = Self-Regulation, SD = Self- Drive, EM = Empathy, SM = Social Motive.

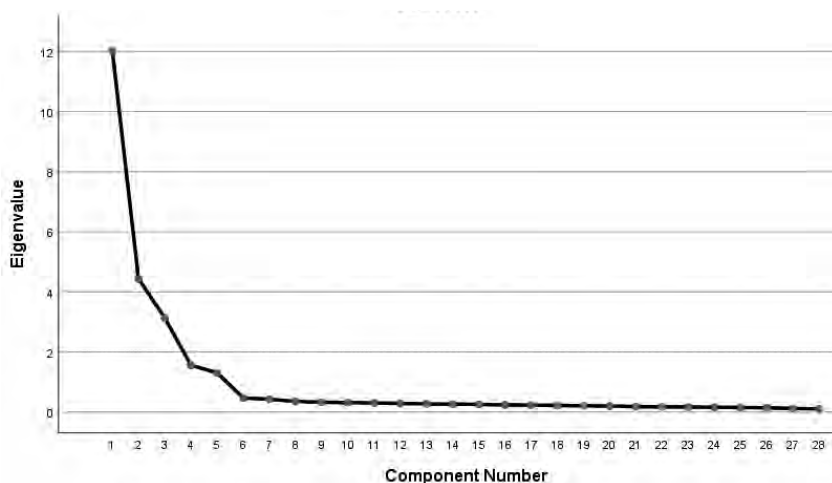


Figure 1. – Scree plot for five factors of emotional intelligence construct.

Scree plot (Fig. 1) showing five steep slope plots of the line that indicates the five-factor model of emotional intelligence. Pearson's product-moment correlational analysis was conducted to check whether the latent factors of emotional intelligence were related to each other or not. At the same time inter factor correlation matrix also identified a significant inter-relationship among items (Tab. 4). As a result, statistically significant positive bivariate correlation coefficients were found. The results showed in Table 5 that empathy moderately correlated with Self-Regulation ($r = 0.49$, $p < 0.01$) than with Self-Perception ($r = 0.37$, $p < 0.01$) and Self-Drive ($r = 0.38$, $p < 0.01$).

Further, the correlation between Self-Regulation and Self-Drive was strongest ($r = 0.67$, $p < 0.01$). Self-Perception and self-Regulation are weakly related ($r = 0.27$, $p < 0.01$). Social Motive is strongly related with empathy ($r = 0.66$, $p < 0.01$) than Self-Perception ($r = 0.32$, $p < 0.01$), Self-Regulation ($r = 0.54$, $p < 0.01$), Self-Drive ($r = 0.39$, $p < 0.01$). After this analysis, it can be concluded that every dimension is interrelated. Low values of Cohen's coefficients (Cohen, 1988) mean intra-construct correlations were minimal in size. This implies that all dimensions are significantly correlated. So, emotional intelligence can be considered an essential psychological construct.

5.3. Confirmation of the measurement model

5.3.1. RQ 2: What are the psychometric properties of the emotional intelligence scale?

After getting the results of zero-order confirmatory factor analysis considering all 28 items in a 1-factor model indicates poor model-fit indices: $\chi^2/df = 9768.99$, $p < 0.001$, TLI = 0.398, PNFI = 0.403, GFI = 0.309, PCFI = .410, SRMR = 0.236, CFI = 0.443. Here, 2-factor, 3-factor, and 4-factor model fit results in an inferior model fit from a series of confirmatory factor analyses. Finally, a first-order confirmatory factor analysis (Byrne, 2005) with the final 28 scale items under the five factors (SP, SR, SD, EM, and SM) of emotional intelligence was conducted. The model fit level is highly satisfactory and supports the 5-factor model: $\chi^2/df = 3.19$, $p < 0.001$, CFI = 0.956, GFI = 0.876, TLI = 0.951, PCFI = 0.860, PNFI = 0.843, SRMR = 0.056, RMSEA = 0.06. Finally, after confirmatory factor analyses, the 5-factor model (Fig. 2) of emotional intelligence was retained as it showed a better fit than other factor models. Model fit indices are depicted below in Table 6, where different dimensions of emotional intelligence are abbreviated as (SP = Self-Perception, SR = Self-Regulation, SD = Self-Drive, EM = Empathy, SM = Social Motive).

Observed variables and latent variable relationships were checked using standardized factor loadings, which should be ≥ 0.55 (Anderson & Gerbing, 1988; Comrey & Lee, 1992; Harrington, 2008; Hair *et al.*, 2017). All the factor loadings are statistically significant in the five-factor model ($p < 0.001$) and ranged between 0.800 and 0.918. Although, the composite reliability (CR) coefficients for each dimension of emotional intelligence (Self-Perception, Self-Regulation, Self-Drive, Empathy, and Social Motive) were 0.95, 0.94, 0.95, 0.93, 0.95, respectively) demonstrated a satisfactory value above 0.70 (Fornell, 1982).

Table 6. – Model fit indices of 1-factor to 5-factor models from confirmatory factor analyses.

FACTOR MODEL	χ^2 (df)	P	df	χ^2 /df	CFI	GFI	TLI	PCFI	PNFI	SRMR	RMSEA
<i>One factor model</i>											
Model 1: SP/SR/SD/EM/SM ^a	9768.99	< .001	350	27.91	0.443	.309	0.398	.410	0.403	0.236	0.211
<i>Two-factor models</i>											
Model 2: SP+SR/SD/EM/SM	6627.53	< .001	349	18.99	0.629	.394	0.598	.580	0.569	0.181	0.172
Model 3: SR+SP/SD/EM/SM	8193.67	< .001	349	23.48	0.536	.377	0.497	.495	0.486	0.242	0.192
Model 4: SD+SR/SP/EM/SM	7479.05	< .001	349	21.43	0.578	.384	0.543	.534	0.524	0.209	0.183
Model 5: EM+SR/SD/ SP /SM	8570.26	< .001	349	24.56	0.514	.343	0.473	.474	0.466	0.234	0.197
Model 6: SM+SR/SD/EM/SP	7882.92	< .001	349	22.59	0.554	0.358	0.517	.512	0.502	0.225	0.189
<i>Three-factor model</i>											
Model 7: SP+SR+SD/EM/SM	5042.609	< .001	347	14.532	0.722	.524	0.697	.663	0.650	0.195	0.149
Model 8: SP+SR/SD/EM+SM	4843.62	< .001	347	13.96	0.734	.554	0.710	.674	0.661	0.195	0.146
Model 9: SP+SR/SD/SM+EM	5264.84	< .001	347	15.17	0.709	.477	.683	.651	0.638	0.180	0.153
Model 10: SP/SR/SD+EM+SM	6009.39	< .001	347	17.32	0.665	.432	.635	.611	0.599	0.204	0.164
Model 11: SP/SR/EM+SM+SD	6132.66	< .001	347	17.67	0.658	.402	.627	.604	0.592	0.186	0.166
Model 12: SP/SR/SM+EM+SD	6444.30	< .001	347	18.57	0.639	.420	.607	.587	0.576	0.206	0.170

FACTOR MODEL	χ^2 (df)	P	df	χ^2 /df	CFI	GFI	TLI	PCFI	PNFI	SRMR	RMSEA
<i>Four-factor models</i>											
Model 13: SP+SR+SD+EM/SM	2277.86	< .001	344	6.62	0.886	.717	.874	.806	0.790	0.086	0.096
Model 14: SP+SR+SD/EM+SM	3414.95	< .001	344	9.93	0.818	.607	.80	.745	0.730	0.201	0.121
Model 15: SP+SR+SD/SM+EM	3910.85	< .001	344	11.37	0.789	.603	.768	.718	0.704	0.192	0.131
Model 16: SP+SR/SD+EM+SM	2540.05	< .001	344	7.38	0.870	.673	.857	.792	0.776	0.099	0.103
Model 17: SP+SR/EM+SD+SM	2989.57	< .001	344	8.69	0.844	.613	.828	.768	0.753	0.135	0.113
Model 18: SP+SR/SM+SD+EM	3214.39	< .001	344	9.34	0.830	.616	.813	.756	0.741	0.142	0.117
Model 19: SP/SR+SD+EM+SM	3985.86	< .001	344	11.59	0.785	.586	.763	.714	0.700	0.267	0.132
Model 20: SP/SD+SR+EM+SM	4326.58	< .001	344	12.58	0.764	.590	.741	.696	0.682	0.290	0.138
Model 21: SP/EM +SR+SD+SM	3400.74	< .001	344	9.89	0.819	.614	.801	.746	0.731	0.223	0.121
Model 22: SP/ SM+SR+SD+EM	4356.56	< .001	344	12.66	0.763	.527	.739	.694	0.681	0.166	0.139
<i>Five-factor models</i>											
Model 23: SP+SR+SD+EM+SM	1085.66	< .001	340	3.19	.956	.876	.951	0.860	0.843	0.056	0.06

Note: A single emotional intelligence scale (SP or SR or SD or EM or SM) refers to a distinct factor with the items solely loaded on that factor. A set of emotional intelligence scales in a group (e.g., SP/SR/SD/EM/SM) refers to a common combined factor with all items from those factors loaded on that single composite factor. The + sign was used to mean distinct factors, and the / sign was used to mean the combination of items in two or more factors.

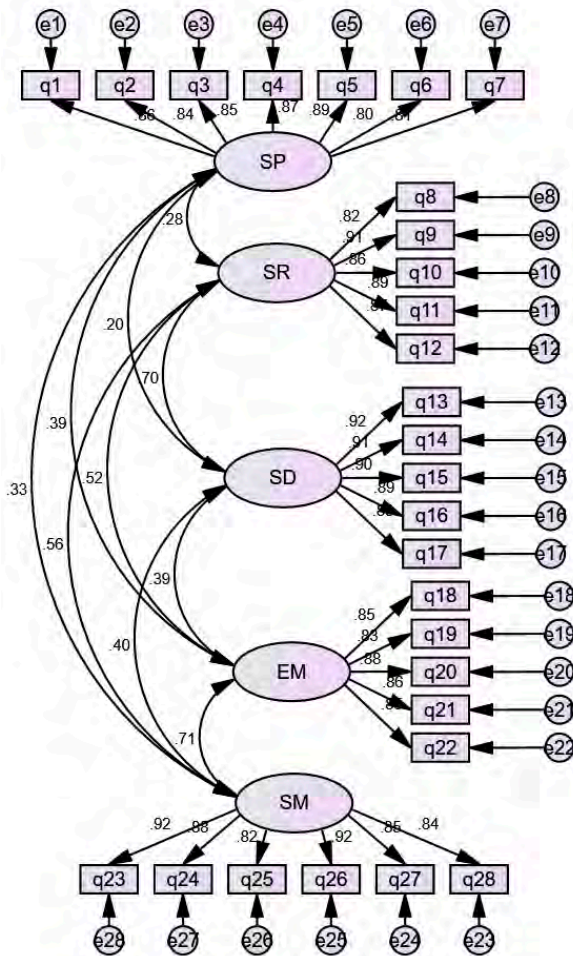


Figure 2. – Structural model of five factors of emotional intelligence scale (standardized coefficient).

The CR for the whole construct as emotional intelligence was 0.95 with 95% confidence intervals (CIs) (0.824, 0.862). However, the average variance extracted (AVE) for each dimension (Self-Perception, Self-Regulation, Self-Drive, Empathy, and Social Motive, was 0.72, 0.76, 0.79, 0.73, and 0.76, respectively) was more significant than 0.50 (Fornell, 1982; Bagozzi & Yi, 1988). The results indicate a more significant common variance due

to the measurement error. These results indicate that each of the dimensions qualifies for convergent validity ($CR > 0.70$, $AVE > 0.5$, $CR > AVE$; Hair *et al.*, 2017). The Cronbach's α value for Self-Perception, Self-Regulation, Self-Drive, Empathy, and Social Motive was 0.946, 0.940, 0.950, 0.931, 0.951, and 0.95 for the overall scale was higher than the statistically acceptable figures ($\alpha > .7$; Hair *et al.*, 2017). This showed the high reliability of the instrument.

Further, maximum shared variance (MSV) (for SP = 0.16, SR = 0.49, SD = 0.49, EM = 0.50, SM = 0.50) and average shared variance (ASV) (for SP = 0.09, SR = 0.27, SD = 0.18, EM = 0.25, SM = 0.25) for each latent construct were calculated from intra-construct correlation coefficients in the 5-factor measurement model. For each latent factor, both MSV and ASV were found to be numerically less than AVE. So, it fulfills the criteria for discriminant validity (Fornell & Larcker, 1981; Hair *et al.*, 2014). Convergent and discriminated validity is given in below *Table 7* and *Table 8* of the emotional intelligence scale.

Table 7. – Convergent validity of emotional intelligence scale.

FACTORS	CR	AVE	AVE > 0.5	CR > 0.7	CR > AVE	CONVERGENT VALIDITY
SP	0.95	0.72	Satisfied	Satisfied	Satisfied	Established
SR	0.94	0.76	Satisfied	Satisfied	Satisfied	Established
SD	0.95	0.79	Satisfied	Satisfied	Satisfied	Established
EM	0.93	0.73	Satisfied	Satisfied	Satisfied	Established
SM	0.95	0.76	Satisfied	Satisfied	Satisfied	Established

Note: SP = Self-Perception, SR = Self-Regulation, SD = Self- Drive, EM = Empathy, SM = Social Motive, CR = Composite reliability, AVE = Average variance extracted.

Table 8. – Discriminant validity of emotional intelligence scale.

FACTORS	AVE	MSV	ASV	AVE > MSV	AVE > ASV	DISCRIMINANT VALIDITY
SP	0.72	0.16	0.09	Satisfied	Satisfied	Established
SR	0.76	0.49	0.27	Satisfied	Satisfied	Established
SD	0.79	0.49	0.18	Satisfied	Satisfied	Established
EM	0.73	0.50	0.25	Satisfied	Satisfied	Established
SM	0.76	0.50	0.25	Satisfied	Satisfied	Established

Note: SP = Self-Perception, SR = Self-Regulation, SD = Self- Drive, EM = Empathy, SM = Social Motive, AVE = Average variance extracted, MSV = Maximum shared variance, ASV = Average shared variance.

So, it can be concluded that the results of CFA confirmed the construct validity means convergent and discriminant validity while qualifying Cronbach alpha reliability of the five-factor measurement model. The present study confirms the five factorial structures of the emotional intelligence construct.

6. CONCLUSIONS

In this study, gender and teaching experience are considered demographic variables. First, after a thorough review of related literature, the emotional intelligence scale was prepared. Most of the studies dealt with 5-factor measurement models, whereas some few studies dealt with beyond the 6-factor structure of emotional intelligence. So, the present study attempted to develop such items, and the teachers rated those items on the given scale. The study came up with a first-order 5-factor measurement model of emotional intelligence with inter-correlated dimensions that showed good model fit and good psychometric properties. Therefore, it can be concluded that emotional intelligence can measure in terms of Self-Perception, Self-Regulation, Self-Drive, Empathy, and Social Motive. These are the five dimensions of the emotional intelligence scale. However, this tool was observed to be appropriate across different demographic variables like gender and teaching experiences. Hence, the instrument may use to measure emotional intelligence, and valid inferences can be drawn. Finally, this measurement model will allow the researchers to interpret teachers' perceptions about different situations in schools and societal contexts. From this, knowledge about teachers' strengths and weaknesses and their psychological needs will be examined. This might be helpful for the teachers so that they can adjust their teaching and emotionally intelligent behavior accordingly for adolescent students coming from different socio-cultural backgrounds to fulfill the basic requirements. So, the final emotional intelligence scale has been demonstrated to be useful for research and teaching purposes.

7. RECOMMENDATIONS

A highly emotionally intelligent teacher can handle his students with love and care and cope with undesirable behavior like anxiety, frustration, boredom, and depression-collectively taken as stress. There were certain limita-

tions found while interpreting the findings. One of the main problems of the study is mainly dealing with the specific geographical context of India. In the future, it can be conducted in a significant geographical and cultural context of India. This scale is mainly prepared with a small number of items. Still, to measure a psychological construct like emotional intelligence, which affects personality, it is necessary to measure it by using many more positive and negative items. Studies may be conducted on other psychological constructs. On the other hand, future studies may carry forward with several dimensions and for other age groups.

Further, data collected using a scale may be contaminated with the halo effect. Every teacher will try to give socially acceptable answers, not accurate ones. Hence, following a multi-informant approach, other means of measuring emotional intelligence are recommended to cross-validate data through triangulation in future studies to counter the potential measurement bias that helps for further correction. The central focus of the study is based on the context of secondary school education which restricts us from generalizing the findings to the higher level of education. In the future, it can be conducted on different targeted populations like lawyers, administrators, and medical sector people apart from only secondary school teachers. Finally, measurement of the emotional intelligence scale may be conducted vertically across clusters, blocks, districts, states, and at the national level, and laterally across primary, upper primary, higher secondary, and a higher level of education, irrespective of the different targeted populations.

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RIASSUNTO

In questo studio abbiamo sviluppato e validato un nuovo strumento: una scala di intelligenza emotiva per insegnanti. L'articolo si concentra sulle proprietà psicometriche della scala dell'intelligenza emotiva per gli insegnanti che si occupano di studenti adolescenti. Lo strumento è stato convalidato su 608 insegnanti di scuola secondaria in India. Questa scala è stata sottoposta ad analisi fattoriale esplorativa (EFA) ed analisi fattoriale confermativa (CFA), sono stati inoltre calcolati l'alfa di Cronbach e la correlazione item-total. I risultati hanno mostrato una buona affidabilità ($\chi^2/df = 1085,66$, CFI = 0,956, GFI = 0,876, TLI = 0,951, PCFI = 0,860, PNFI = 0,843, RMSEA = 0,06 e SRMR = 0,056) per le cinque componenti (Percezione di sé, Auto-regolazione, Auto-orientamento, Empatia, Socialità) del modello di misurazione. L'80,18% della varianza totale è stata spiegata dai suddetti fattori. Affidabilità (Cronbach alpha = 0,95) e validità del costrutto significano che è stata stabilita la validità di conversione e

discriminante per l'innovativa scala di intelligenza emotiva di un insegnante. Infine, i solidi risultati indicano che lo strumento potrebbe essere utilizzato in ulteriori studi in diverse aree di ricerca.

Parole chiave: Analisi fattoriale; Esperienze di insegnamento; Intelligenza emotiva; Proprietà psicometriche; Validazione statistica.

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