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Measuring teacher beliefs about factors that promote Classroom Social and Emotional Learning (CSEL)

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ABSTRACT

The success of social and emotional learning (SEL) in the classroom hinges on the buy-in of teachers, as they serve as the principal implementers of SEL initiatives. This is particularly relevant in contexts where SEL is nascent and emerging. In response to this need, we developed a scale to measure teachers' beliefs about factors that promote classroom social and emotional learning (CSEL). We validated the scale in India, where SEL has recently gained attention, on a large sample of teachers (N = 2097). Factor analysis revealed a three-factor structure comprising beliefs about healthy classroom management, inclusive classroom culture and supportive student relationships. The scale demonstrated good psychometric properties: strong internal consistency, predictive validity (with mental well-being), convergent validity (with emotional intelligence), discriminant validity (with perceived stress) and measurement invariance across males and females. We hope that understanding teachers' beliefs on these factors can help inform successful program implementation, and thus offer crucial insights for mainstreaming SEL.

Impact Statement: Social and emotional learning's (SEL) classroom success hinges on teacher buy-in as primary implementers. We crafted a scale measuring teachers' beliefs in promoting classroom SEL (CSEL), validated in India with 2097 teachers. The scale revealed three factors: healthy management, inclusive culture, and supportive relationships. It showed strong psychometric properties, correlating with well-being and emotional intelligence, inversely with stress. Gender-invariant measurement ensures robustness. These beliefs inform effective program implementation, crucial for SEL mainstreaming in education.

1. Introduction

Social and Emotional Learning (SEL) can be described as the process of developing the skills, abilities, and/or attitudes necessary to recognize and control emotions, develop caring and concern for others, form positive relationships, make responsible decisions, and deal with challenging situations (Greenberg et al., 2003; Payton et al., 2000). Several meta-analyses have demonstrated that SE skills bolster positive student development across various domains, such as mental well-being, active citizenship, achievement motivation and academic success (Corcoran et al., 2018; Durlak et al., 2011; Sklad et al., 2012; Taylor et al., 2017; Wigelsworth et al., 2016). As a consequence, there are now global efforts to deliver SEL in classrooms as well as mainstream it in education systems.

Successful delivery of SEL is influenced by various factors such as teacher perspectives and preparedness, pedagogical frameworks, and school culture, with a large body of work suggesting that teachers, as the primary implementers of SEL, and teacher-related factors, are central elements in fostering SEL (Martínez, 2016; Wanless & Domitrovich, 2015). One such teacher-related factor is teachers' beliefs, which have a strong relationship with teaching practices (Holzberger et al., 2013). In fact, teachers' belief in their capabilities to effectively handle the responsibilities inherent in their professional role, or self-efficacy, is correlated with educational outcomes such as persistence, enthusiasm and instructional behavior (Tschannen-Moran & Hoy, 2001), as well as classroom management (Romi & Leyser, 2006). This is because it is believed that teachers with high levels of self-efficacy can help support students encountering difficulties in their day-to-day learning by attending to their cognitive, emotional, and physical well-being, adjusting their teaching strategies, and fostering a classroom environment that prioritizes student learning (Holmes, 2021).

In the context of SEL, teachers' beliefs are usually linked to how they

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put SEL into practice (Collie et al., 2015; Zinsser et al., 2014). For instance, teachers' beliefs about SEL can significantly impact their openness to SEL programs, confidence in implementing SEL, and perceived efficacy of the programs (Brackett et al., 2012). Teachers who perceive SEL as valuable, incorporate it into both formal SEL curricula and their day-to-day student interactions, by employing pedagogical practices such as modeling, coaching, and scaffolding in their classrooms (Jennings & Greenberg, 2009; Zinsser et al., 2014). Teachers' SEL beliefs are also positively linked to higher levels of self-efficacy in teaching SEL, receptiveness to SEL initiatives, and the inclusion of SEL content in their classrooms (Ransford et al., 2009).

A review of the literature on existing measures of teachers' beliefs related to SEL reveals a primary focus on assessing teachers' beliefs on factors determining the success or efficacy of SEL implementation. These include measures assessing teachers' beliefs on a) teaching-related factors such as their comfort levels in teaching SEL, their familiarity with SEL and their commitment to learning and enhancing SEL skills (Brackett et al., 2012; Schiepe-Tiska et al., 2021), b) school-related factors such as perceptions of prevailing school culture, support from principals, whether the school environment fosters SEL and the role of schools in integrating SEL (Brackett et al., 2012; Buchanan et al., 2009; Huck et al., 2023; Schiepe-Tiska et al., 2021), and c) training and implementation-related factors such as teachers' training experiences and implementation barriers (Buchanan et al., 2009; Huck et al., 2023; Schiepe-Tiska et al., 2021). Other scales, such as those developed by Beets et al. (2008), Domitrovich et al. (2016) and Schultz et al. (2010) are associated with established SEL programs/interventions like Second Step, Positive Action, PAX GBG and PATHS.

Most of these measures have been developed and validated in geographies where SEL is well integrated into the school or state education policies, and thus their emphasis lies on evaluating program effectiveness or ensuring fidelity of established frameworks. However, in emerging contexts where SEL has only recently gained attention, it might be essential to first understand teachers' beliefs about the factors that promote SEL inside classrooms. Examples of such contexts include countries like Brazil, Mexico, Vietnam and India, where SEL is increasingly being recognized as essential for addressing educational inequalities and improving student outcomes. In Brazil, SEL was only recently incorporated into the curriculum through the development of Brazilian National Standards for Curriculum in 2018, aiming to reduce the overemphasis on cognitive aspects in assessing children's progress (Cunha et al., 2021). Similarly, in Mexico, SEL is being integrated into education reform efforts through the New Model for Public Education (Gobierno de México, 2018) in order to tackle issues such as school violence, dropout rates, and academic underachievement. Revised education curriculums in Vietnam (Sơn, 2017) and India (Ministry of Human Resource Development, Government of India, 2020) have also increasingly emphasized on the development of SEL policies to not only address persistent social challenges like poverty and inequality but also to protect students' mental well-being.

Classroom-level factors are often the least researched when investigating drivers of success and fidelity of SEL implementation (Wanless & Domitrovich, 2015). Yet an optimal classroom climate is needed for both SEL reception and uptake. Just as teachers are the primary implementers of SEL, they are also the primary force (in collaboration with their students) in shaping a classroom culture that promotes SEL. Some crucial teacher-driven factors responsible for developing a classroom culture that promotes classroom SEL include healthy management of classroom behaviors, developing safe and inclusive classroom climates, and positive teacher-student relationships (Ferreira et al., 2020; Norris, 2003; Reicher, 2010). Healthy classroom management establishes the ground for promotion of SEL within the classroom since it enables students to feel secure, take risks and gain new information, thereby optimizing their learning experiences (Evertson et al., 2003). It also involves fostering a sense of positive community that helps in the seamless incorporation of SEL into classroom life. This is because rather than being treated as an additional task, it becomes an inherent part of establishing relationships, routines, and procedures (Norris, 2003). Inclusive classroom climates, which prioritize the social and emotional well-being of all students, can also help promote SEL by reducing social marginalization among students (Preast et al., 2020) as they enable students as well as teachers to develop the skills to understand one another and to communicate and work together effectively. In fact, promoting inclusive climates and SEL go hand in hand through the development of learning environments that value diversity (Reicher, 2010). In a similar way, supportive teacher-student relationships are considered essential for the promotion of SEL (Klem & Connell, 2004) as they are inherently linked to meaningful learning, and the concomitant fostering of student success (Ferreira et al., 2020). Through the development of supportive relationships, students feel valued, respected, and connected to their teachers, which allows for looking after each other's social and emotional needs (Konishi & Wong, 2018).

In the context of new or nascent SEL geographies, teachers' beliefs on these factors can provide insight into how they perceive classroom SEL factors and the strategies they believe to be effective. Moreover, since teachers' beliefs influence their instructional practices, they can help increase the likelihood of successful program implementation in the future. Ultimately, it can provide policymakers and educators with valuable insights into the readiness of the educational system for SEL adoption, laying the groundwork for its widespread implementation.

1.1. Aim

In this study, our goal was to develop and validate a scale that measures teachers' beliefs regarding factors that promote SEL in classrooms. As pointed out before, such an instrument could help address the requirements of early-stage SEL efforts in classrooms, in schools and in policy.

We validated this scale in India, where SEL has recently received focused attention due to its inclusion in the new National Education Policy released in 2020 (Ministry of Human Resource Development, Government of India, 2020), which made SEL goals explicit in Indian classrooms. India has a vast educational ecosystem with a teacher population that exceeds 900,000 (Unified District Information System for Education (UIDSE), 2019), and an urgent and necessary requirement for the successful implementation of these goals is the need to ascertain teacher beliefs about factors that promote SEL in the classroom.

2. Materials and methods

2.1. Item development

We broadly followed guidelines set by Boateng et al. (2018) on the development of items for social and behavioral scales. A pair of two researchers, both having 30 + years of English fluency, as well as experience in designing and researching SEL programs in education, used deductive methods to create a set of 21 items[1] for CSEL. These items encapsulated beliefs corresponding to the three identified teacher-driven factors crucial for cultivating an SEL-promoting classroom environment, *i.e.*, *healthy management of classrooms* (items CSEL-5, 11, 12, 18, 19, 20, 21), *creation of an inclusive classroom climate* (items CSEL-1, 6, 7, 10, 13, 14, 16, 17) and *cultivation of supportive teacher-student relationships* (items CSEL-2, 3, 4, 8) (Ferreira et al., 2020; Norris, 2003; Reicher, 2010). The process entailed reviewing existing literature on the assessment of teacher-related psychological constructs such as beliefs, perspectives, values, and competencies to ensure the appropriateness of syntax, as well as literature on classroom SEL to cover the thematic breadth of items captured under the three factors.

[1] A total of 25 items were developed and administered, however only 21 items were finally found relevant to teacher beliefs.

Syntactically, the items covered beliefs about significance (*I value…, I believe…*), beliefs about knowledge (*I find it important to know…, I know…*), and beliefs about confidence or self-efficacy (*I am able to…*), all aspects of beliefs which could possibly contribute to promoting SEL within classrooms. Through the items, the authors posited that educators who believe in the significance of these factors would invest time, resources, and effort into incorporating SEL in classrooms. Moreover, teachers who believe themselves to be knowledgeable about SEL would be more inclined to feel capable of integrating SEL effectively. Along similar lines, teachers who are confident in their ability to maintain healthy classroom dynamics, foster inclusivity and nurture supportive teacher-student relationships would be more likely to proactively integrate SEL.

Thematically, items classified under the healthy classroom management factor evaluated teacher beliefs about crucial sub-factors, such as managing classroom dynamics (Farmer et al., 2019) [*e.g., CSEL-11: I know how to help my students generate their own questions and seek out the answers*], resolving conflicts (Morris-Rothschild & Brassard, 2006) [*e.g., CSEL-19: I am able to positively manage conflict in my classrooms*], and promoting positive behaviors (Mitchell & Bradshaw, 2013) [*e.g., CSEL-21: I am able to promote positive behaviors in my classrooms*]. Similarly, items classified under inclusive classroom climate measured various dimensions related to inclusivity, including recognition and appreciation of diversity (Beck & Kosnik, 2014) [*e.g., CSEL-6: I value the social, economic and religious differences in my classroom*], facilitation of self-reflection and critical thinking (Saunders & Wong, 2020) [*e.g., CSEL-10: I value helping students examine their perceptions and biases*], and promotion of kindness and ethical behavior (Narvaez, 2010) [*e.g., CSEL-17: I value ethical learning and behavior in the classroom*]. Lastly, the items under supportive student relationships focused on teachers' beliefs about connecting with students, which entails understanding their needs (Davis, 2003; Spilt et al., 2011) [*e.g., CSEL-4: I find it important to know about personal difficulties my students may be facing (economic, social, and linguistic)*], and facilitating their engagement in learning (Bryson & Hand, 2007; Pianta et al., 2012) [*e.g., CSEL-3: I know the drives, motivations, and interests of students in my classroom*].

The item pool was constrained to 21 items (including two items that were negatively worded - CSEL-9 and 15; to check for agreement bias) due to the increasing trend in recent years favoring the utilization of short scales for psychological assessments in research, as highlighted by Kruyen et al. (2013). Short scales offer time efficiency, particularly in the context of large-scale studies (Morgado et al., 2017). Additionally, employing shorter assessments has the potential to cut costs and enhance participation rates (Edwards et al., 2004). This approach can also help mitigate participant fatigue, ultimately contributing to the improved quality of the gathered data (Sharma et al., 2022). Necessary item construction standards were followed to limit measurement error, such as avoiding complex wording, ambiguity, double-barreled items, jargon, and biased questions (Devellis, 2012).

To uphold content validity, face validity and ensure cultural and linguistic appropriateness of the scale, a thorough consultation process with experts and teachers was conducted. Initially, an expert review involved collaboration with a team of five individuals, which included SEL researchers and former and existing teachers, all familiar with and/or part of the education system in India. All team members were proficient English speakers with over 20 years of fluency. During this phase, each team member independently provided feedback on the scale items, evaluating aspects such as completeness, clarity, and contextual relevance. Additionally, they assessed the content validity of the scale. Written feedback was provided, which was incorporated into the scale items. To further evaluate face validity, a sample of teachers nominated by the State Council of Educational Research and Training (SCERT) in India participated in the pilot testing of the survey. The scale was finalized after all sources of feedback were considered (see full list of items in Table 2). For the items, a 5-point Likert scale was chosen as the response scale, having extremes ranging from 1 ("*Completely Disagree*") to 5 ("*Completely Agree*").

Table 1
Sample characteristics (Study 1: $N = 2097$; Study 2: $N = 310$).

Characteristic	Study 1	Study 2
Age (in years), *M* (*SD*)	43.00 (9.83)	42.06 (10.00)
Gender, *n* (%)		
Male	1085 (51.7 %)	63 (20.32 %)
Female	996 (47.5 %)	247 (79.68 %)
Others	16 (0.8 %)	0 (0 %)
Grade levels taught, *n* (%)		
Primary (Grades K-2)	145 (6.9 %)	6 (1.94 %)
Elementary (Grades 3-5)	189 (9.0 %)	6 (1.94 %)
Middle (Grades 6-8)	660 (31.5 %)	135 (43.55 %)
High (Grades 9-12)	1028 (49.0 %)	158 (50.97 %)
Others	75 (3.6 %)	5 (1.61 %)
Teaching experience (in years), *M* (*SD*)	15.00 (9.32)	14.00 (11)
School community, *n* (%)		
Rural	1346 (64.2 %)	76 (24.52 %)
Semi-Urban	216 (10.3 %)	36 (11.61 %)
Urban	535 (25.5 %)	198 (63.87 %)
Teaching profile, *n* (%)		
General Education Teacher	1324 (63.1 %)	220 (70.97 %)
Special Education Teacher	286 (13.6 %)	8 (2.58 %)
Resource Teacher	130 (6.2 %)	12 (3.87 %)
Education Consultant/Counselor	123 (5.9 %)	6 (1.94 %)
Others	234 (11.2 %)	51 (16.45 %)

Predictive validity was evaluated through delivering an additional measure on mental well-being. Concurrent validity was not examined as there are currently no gold standard SEL belief measures that are suitable for the sample of teachers in consideration. Construct validity was assessed through delivering additional measures on emotional intelligence (for convergent validity) and perceived stress (for discriminant validity).

2.2. Participants

A total of 2097 teachers from private and public schools in India completed the CSEL over a period of one year in 2021–22 (Mean age = 43 years (*SD* = 9.83; range = 18–74 years), Female:Male:Other (in percentages) = 47.5:51.7:0.8). These teachers were enlisted for an online program focused on learning SEL for classrooms. As a part of this initiative, they had to complete the scale at the start of the program. To recruit participants, the study utilized partnerships with state governments and private schools affiliated with the host research institution. School leaders were contacted either directly or through an implementation partner, and they recommended teachers to join the study. Complete demographic information of the participants is presented in Table 1 (Study 1).

A separate sample of teachers ($N = 310$) completed the validated version of CSEL along with other measures (in 2023) to examine the convergent, discriminant and predictive validities of the scale. Their demographic information can also be found in Table 1 (Study 2).

2.3. Procedure

The onset of the studies was through an online information session where teachers were provided details about the studies, invited to participate and introduced to a learning platform (entitled '*Framerspace.*' available at www.framerspace.com), which hosted CSEL. Participants completed CSEL and a short demographic form that collected information on gender, age, teaching experience, grade levels taught, school community and teaching profile. Any personally identifiable information (PII), such as name or email address, was not collected throughout the process. However, an anonymous identifier was assigned to each participant when they logged on to *Framerspace*, which helped track duplicate entries. Additionally, informed consent was sought from participants for their participation in the study.

Table 2
Descriptive statistics and factor loadings for the EFA sample (N = 1048).

Item	Range	*M* (*SD*)	Factor Loading		
			1	2	3
CSEL-1: I find it important to know students' names.	1-5	4.71 (0.71)	-0.19	**0.54**	0.30
CSEL-2: I am able to connect deeply with my students on various issues.	1-5	4.44 (0.81)	0.09	0.02	**0.66**
CSEL-3: I know the drives, motivations, and interests of students in my classroom.	1-5	4.43 (0.74)	0.23	-0.09	**0.67**
CSEL-4: I find it important to know about personal difficulties my students may be facing (economic, social, and linguistic).	1-5	4.54 (0.73)	-0.12	0.37	**0.53**
CSEL-5: I am able to address discipline issues by helping students feel connected with their school.^	1-5	4.48 (0.72)	0.41	0.02	0.47
CSEL-6: I value the social, economic and religious differences in my classroom.	1-5	4.13 (1.36)	-0.24	**0.72**	0.04
CSEL-7: I am able to reflect on my own mistakes in front of my students.	1-5	4.14 (1.05)	-0.06	**0.51**	0.10
CSEL-8: I value talking with parents towards addressing their child's challenges and difficulties.^	1-5	4.57 (0.68)	0.08	0.37	0.48
CSEL-10: I value helping students examine their perceptions and biases.	1-5	4.48 (0.76)	0.10	**0.53**	0.18
CSEL-11: I know how to help my students generate their own questions and seek out the answers.	1-5	4.44 (0.75)	**0.56**	0	0.34
CSEL-12: I value the outcomes of learning (such as correct answers) over the process of learning (such as discovery and inquiry).^	1-5	3.89 (1.41)	**0.57**	-0.22	0.13
CSEL-13: I value debate and the sharing of multiple perspectives over a single, unitary truth.	1-5	4.46 (0.82)	0.25	**0.52**	-0.02
CSEL-14: I am able to help my students cultivate social and emotional competencies alongside academics in my classroom.^	1-5	4.53 (0.75)	0.50	0.17	0.19
CSEL-16: I value kindness in the classroom.	1-5	4.71 (0.59)	0.33	**0.73**	-0.17
CSEL-17: I value ethical learning and behavior in the classroom.	1-5	4.69 (0.61)	0.42	**0.66**	-0.18
CSEL-18: I believe that classroom management includes strategies that promote positive behaviors.	1-5	4.75 (0.56)	0.46	**0.63**	-0.13
CSEL-19: I am able to positively manage conflict in my classrooms.	1-5	4.52 (0.68)	**0.74**	0	0.18
CSEL-20: I believe the purpose of classroom management is to promote respect in the classroom.	1-5	4.55 (0.74)	**0.56**	0.35	-0.14
CSEL-21: I am able to promote positive behaviors in my classrooms.	1-5	4.67 (0.57)	**0.80**	0	0.09

^Deleted items from the final scale
Note. Loadings forming each factor are highlighted in bold (cutoff used for factor extraction = 0.50). Items 9 and 15 were used to check for agreement bias and were excluded from the EFA

2.4. Measures

In addition to delivering the CSEL, the following measures were delivered to the study 2 participants:

2.4.1. Emotional intelligence

The Schutte Self-Report Emotional Intelligence Test (SSEIT) was used to measure general emotional intelligence (Schutte et al., 1998). It consists of 33 items related to emotional experiences, expression, regulation, and understanding, which are rated on a 5-point Likert scale ("Strongly Disagree" to "Strongly Agree"). The scale is divided into five subscales: *perception of emotion* ($\alpha = 0.84$), *managing one's emotions* ($\alpha = 0.78$), *managing others' emotions* ($\alpha = 0.65$), *utilization of emotion* ($\alpha = 0.83$) and an *uncategorized* subscale ($\alpha = 0.86$). In our sample, CFA results indicated satisfactory goodness-of-fit indices for the 5-factor classification: CFI = .976, TLI = .973, RNI = .976, RFI = .964 and SRMR = .08.

2.4.2. Well-being

Well-being was measured using the 7-item Warwick-Edinburgh Mental Well-Being Scale (WEMWBS; Stewart-Brown et al., 2009). It includes items that cover both feeling and functioning aspects of mental well-being, such as positive affect, life satisfaction, and functioning in daily activities. In our sample, a CFA indicated satisfactory goodness-of-fit for the unidimensional scale: CFI = .994, TLI = .991, RNI = .994, RFI = .987 and SRMR = .05. Respondents rate their agreement with each statement on a 5-point Likert scale ("None of the time" to "All of the time"), and a total score is calculated by averaging ratings on the 7 items ($\alpha = 0.90$).

2.4.3. Perceived stress

The perceived stress scale (PSS-10; Cohen & Williamson, 1988) is a 10-item questionnaire that assesses psychological stress by inquiring about the thoughts and feelings of participants during the last month on a 5-point Likert scale ("Never" to "Very often"). The scale is divided into 2 subscales: *perceived helplessness* ($\alpha = 0.88$), which refers to an individual's feelings of a lack of control over their circumstances, and *lack of self-efficacy* ($\alpha = 0.73$), which refers to an individual's perceived inability to handle problems. For this two-factor structure, CFA results indicated a satisfactory goodness-of-fit in our sample: CFI = .992, TLI = .990, RNI = .992, RFI = .978 and SRMR = .05.

3. Data analysis

All statistical analyses were performed using R v4.0.2. Collected data from Study 1 ($N = 2097$) was randomly split for exploratory (EFA; $N = 1048$) and confirmatory factor analyses (CFA; $N = 1049$).

3.1. Descriptive analysis

Descriptive statistics and bivariate associations were calculated for the item responses on the first half of the data. Normality was examined using the Henze-Zirkler and Shapiro-Wilk tests, which indicated the absence of both multivariate and univariate normality (p-values < 0.05).

3.2. Factor analysis

3.2.1. Exploratory factor analysis

Factor analytic procedures used polychoric correlations given the ordinal nature and non-normality of items (Morata-Ramírez & Holgado-Tello, 2013). Sampling adequacy was tested using the Kaiser-Meyer-Olkin (KMO) test and factorizability was tested using Bartlett's Test of Sphericity. Following this, EFA was performed using principal axis factoring (PAF) with promax rotation, owing to the large size of the dataset. Item loadings below .50 were suppressed (Fabrigar et al., 1999). The selection of factors was based on results of the K1 rule

(Kaiser, 1960), Cattell's scree test (Cattell, 1966), parallel analysis (Horn, 1965) and MAP test (Velicer, Eaton, & Fava, 2000), supplemented with the theoretical judgment of researchers.

3.2.2. Confirmatory factor analysis

On the second half of the data, a CFA model was fitted using robust ML estimation with Satorra-Bentler correction. Items were specified to load onto their hypothesized factors, and factors were standardized at a variance of unity. Goodness of fit was evaluated based on: CFI, TLI > 0.90 (Bentler, 1990), RNI, RFI $> .95$ (Hu & Bentler, 1999), and RMSEA, SRMR < 0.08 (Browne & Cudeck, 1992).

3.3. Reliability

Reliability analysis was performed by calculating Cronbach's Alpha (α): values > 0.70 were deemed sufficient.

3.4. Criterion validity

Predictive validity was ascertained from the data obtained in Study 2 ($N = 310$). Two-tailed, bivariate Pearson correlations between CSEL subscales and the WEMWBS were calculated for the same.

3.5. Construct validity

Internal construct validities were assessed through statistics obtained from the CFA model. Discriminant validity was evaluated through the Fornell-Larcker criterion: Average Variance Extracted (AVE) for each factor > squared correlation involving other factors (Fornell & Larcker, 1981), and the more reliable Heterotrait-Monotrait ratio of correlations (Henseler et al., 2014) < .90 (Teo et al., 2008). Similarly, convergent validity was assessed through cut-offs related to composite reliability (CR) and AVE values: AVE $\geq .50$ and CR $\geq .70$, as suggested by Hair et al. (2010). On Study 2 data, external construct validities were assessed by calculating two-tailed, bivariate Pearson correlations between CSEL subscales, and subscales of the PSS (discriminant validity) and SSEIT (convergent validity).

3.6. Measurement invariance

A multi-factorial invariance analysis was performed to test for psychometric equivalence of the scale across males and females. Configural, metric and scalar invariance were tested in four steps, as suggested by Widaman and Reise (1997). Based on the recommendations of Chen (2007) and Cheung and Rensvold (2002), CFI, RMSEA and SRMR were used to establish measurement invariance: ΔCFI $< .01$, ΔRMSEA $< .015$, and ΔSRMR $< .030$ (for metric invariance) or.015 (for scalar or residual invariance).

4. Results

4.1. Descriptive analyses

Responses on CSEL-9 and 15 indicated no agreement bias. Henceforth, they were excluded from the analysis. Descriptive statistics on the first half of the data were calculated. Scores on all items ranged between 1 to 5 (presented in Table 2).

4.2. Factor analysis

4.2.1. Exploratory factor analysis

The KMO test indicated excellent adequacy of sample size (a value of .95), according to the rules of Kaiser (1974). Additionally, Bartlett's Test of Sphericity (Bartlett, 1954) showed a significant result ($\chi^2 = 17009.55$, $p < .001$), indicating good factorizability of the correlation matrix. An unrestricted solution involving all 19 items (excluding the 2 validation items) led to 3 eigenvalues with magnitudes greater than one. Parallel analysis and MAP test hinted at 2-factor and 3-factor solutions, respectively. Results from the 2-factor solution demonstrated a near-perfect correlation between the obtained factors, indicating discriminant validity issues. As a result, the next step was to extract a 3-factor solution.

In this solution, CSEL-11, 12, 19, 20, 21 were loaded onto factor 1, CSEL-1, 6, 7, 10, 13, 16, 17, 18 onto factor 2, and CSEL-2, 3, 4 onto factor 3. Three items did not load onto any factor (CSEL - 5, 8, 14) and were removed. Despite the fact that the items falling under these three categories did not perfectly match the expected classification (for example, CSEL-18 fell under factor 2 instead of factor 1, which had other classroom management related beliefs), many fell under their expected factors. The cumulative variance explained by these 3 factors was 57% (respective contributions at 22%, 18%, 17%, respectively). There was no evidence of multicollinearity since no items cross-loaded. The three factors were positively correlated with each other ($r_{12} = .61$, $r_{13} = .64$, $r_{23} = .59$). The full list of items falling under the three factors, their loadings and descriptive statistics have been presented in Table 2.

For the CFA model, it was decided to remove CSEL-18 (*"I believe that classroom management includes strategies that promote positive behaviors"*) from factor 2 and place it under factor 1, which comprised items dealing with teacher beliefs on classroom management.

4.2.2. Confirmatory factor analysis

A CFA model was built to refine the obtained factor structure. CSEL-11, 12, 18, 19, 20, 21 were loaded onto factor 1, CSEL-1, 6, 7, 10, 13, 16, 17 onto factor 2, and CSEL-2, 3, 4 onto factor 3. The model converged normally after 27 iterations and demonstrated excellent fit: CFI = .984, TLI = .981, RFI = 0.977, RNI = 0.984, RMSEA (90 % C.I.) = .066 (.061 −.072), and SRMR = .067. Communalities (R^2 values) for most items were greater than or close to .30 (except for items 6, 7 and 12 at .208, .217 and .214, respectively). Item CSEL-6 ("*I value the social, economic and religious differences in my classroom*") was retained given the increasingly heterogeneous classroom populations around the world. Similarly, it was decided that CSEL-7 ("*I am able to reflect on my own mistakes in front of my students*") was important to be retained in the scale as research demonstrates that critical reflection is a crucial component of inclusive classrooms (Saunders & Wong, 2020). However, it was decided that CSEL-12 (*"I value the outcomes of learning (such as correct answers) over the process of learning (such as discovery and inquiry"*) would be removed, since on a second look, the researchers felt that the wording of the item was tough to understand, which could have confused the respondents. Removal of CSEL-12 did not alter the model fit significantly (CFI =.985, TLI =.982, RFI =.979, RNI =.985, RMSEA (90 % C.I.) = .067 (.062 −.073), and SRMR = .066). The final CFA model demonstrated a 15-item, 3-factor structure with all factor loadings significant at $p < .01$. Items under each factor were relooked at, and factor names were developed according to the suggested clustering. Items falling under factor 1 represented beliefs about *healthy classroom management*, factor 2 represented beliefs about *inclusive classroom culture*, and factor 3 indicated beliefs about *supportive student relationships* (see Fig. 1).

4.3. Reliability analysis

Reliability estimates based on Cronbach's alpha yielded sufficient values for all factors: $\alpha_{healthy-class-manage} = .89$, $\alpha_{incl-class-culture} = .84$, $\alpha_{supp-stud-relnshps} = .78$.

4.4. Criterion validity

Table 3 documents the correlations between subscales of the CSEL and the PSS, SSEIT and WEMWBS. As seen in Table 3, all subscales of the CSEL correlated significantly and positively with subscales of the WEMWBS, as expected. Most of these correlations were small to moderate, indicating sufficient predictive validity.

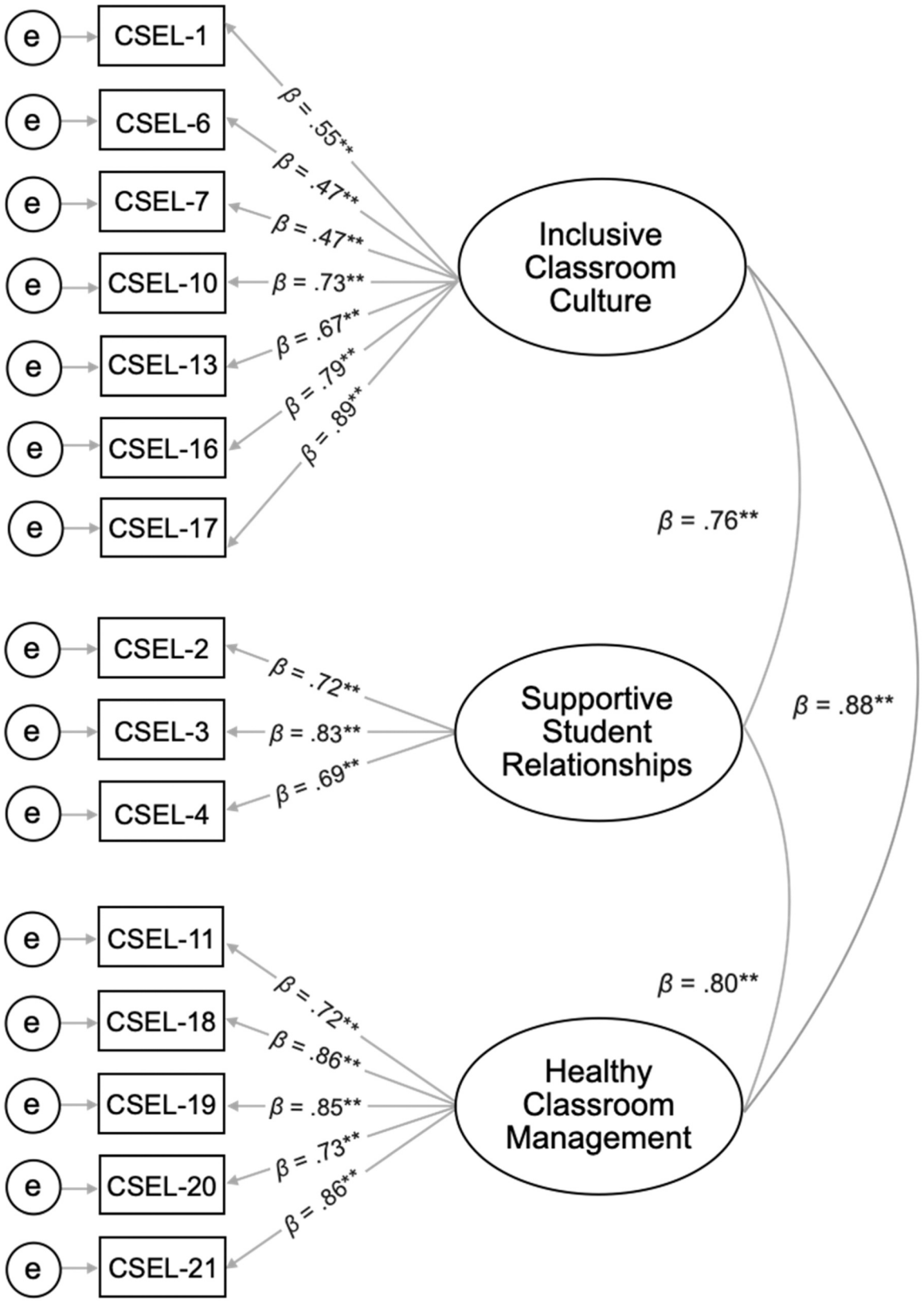

Fig. 1. CFA model for the CSEL ($N = 1049$; ** indicates significance at $p < .01$).

4.5. Construct validity

As seen in Table 4, CR values for all factors were well above the recommended threshold of .70. All but one AVE value was above the recommended cut-off of .50. The Fornell-Larcker criterion was not satisfied since AVE values for each factor were lesser than the squared correlation involving other factors (except between *healthy classroom management* and *supportive student relationships*). However, all HTMT

Table 3
Assessment of external discriminant, convergent and predictive validities of the CSEL ($N = 310$).

	Perceived Stress		Well-being	Emotional Intelligence				
CSEL Factor	Perceived Helplessness	Lack of Self-Efficacy	Mental Well-being	Perception of Emotion	Managing Own Emotions	Managing Others' Emotions	Utilization of Emotion	Uncategorized
Healthy Classroom Management	-0.14*	-0.19**	0.36**	0.49**	0.46**	0.38**	0.52**	0.56**
Inclusive Classroom Culture	-0.05	-0.37**	0.27**	0.44**	0.25**	0.38**	0.3**	0.43**
Supportive Student Relationships	-0.07	-0.22**	0.32**	0.42**	0.25**	0.29**	0.34**	0.38**

*p < .05, **p < .01

Table 4
Assessment of internal discriminant and convergent validity of the CSEL ($N = 1049$).

CSEL Factor	AVE	CR	Squared Correlations			HTMT Value		
			1	2	3	1	2	3
1 - Healthy Classroom Management	**.64**	**.89**	-			-		
2 - Inclusive Classroom Culture	**.45**	**.85**	.77	-		.82	-	
3 - Supportive Student Relationships	**.56**	**.79**	.64	.58		.76	.76	

Note. Convergent validity is established when values of AVE ≥ .50 and CR ≥ .70. Discriminant validity is established when the value of AVE for each factor is greater than the squared correlation involving other factors, or conversely, if all HTMT values < .90.

values were below .90, indicating sufficient internal discriminant validity.

The subscales of the CSEL correlated significantly and positively with the subscales of the SSEIT, as expected (see Table 3). Most of these correlations were within the range of 0.2–0.6 (small to moderate values), indicating sufficient external convergent validity. By contrast, all CSEL subscales correlated negatively with subscales of the PSS, as expected. All three factors displayed significant negative correlations with the *lack of self-efficacy* subscale of the PSS while only beliefs towards *healthy classroom management* were significantly and negatively correlated with *perceived helplessness*.

4.6. Measurement invariance

To undertake a multi-factorial invariance analysis across gender, a subset of data containing responses only from males ($N = 548$) and females ($N = 495$) was extracted on the second half of Study 1 data. Progressively restricted CFA models were created, and values of their adjustment indicators were compared with models in each preceding step. Since values of ΔCFI were < .01, values of ΔRMSEA were < .015, and the values of ΔSRMR were < .015, results of the multi-factorial invariance analysis suggested that males and females responded to the scale similarly (see Table 5).

5. Discussion

The aim of this study was to develop and perform a psychometric validation of the Classroom Social and Emotional Learning (CSEL) scale, focusing on measuring teachers' beliefs regarding factors crucial for cultivating a classroom environment that promotes SEL. The importance of teachers' beliefs in the promotion of SEL cannot be overstated (Wanless & Domitrovich, 2015) since they serve as the primary implementers of SEL practices and programs, making their beliefs central to the integration of SEL within educational settings (Brackett et al., 2012; Ransford et al., 2009; Zinsser et al., 2014). This is particularly important in emerging contexts where SEL is new and still gaining traction, making it essential to learn about teachers' beliefs regarding factors that promote SEL within classrooms. This understanding can not only facilitate enhanced practice but can also provide valuable insights for uptake in policy.

For the validation of CSEL, a total of 21 items were generated. In particular, item development was guided by three identified teacher-driven factors crucial for cultivating SEL-promoting classrooms, *i.e.*, healthy management of classrooms, creation of an inclusive classroom climate and cultivation of supportive teacher-student relationships (Ferreira et al., 2020; Norris, 2003; Reicher, 2010). Items included beliefs assessing importance, knowledge, and the confidence of teachers towards the identified factors. Data was collected from a sample of English-speaking teachers in India and utilized to run EFA and CFA. The analyses yielded a 15-item, 3-factor scale structure (*healthy classroom management*, *inclusive classroom culture*, *supportive student relationships*). The scale exhibited good reliability, construct validity, predictive validity and measurement invariance in males and females. The final scale can be found in Supplementary Materials.

The first factor, *healthy classroom management*, emerged as a 5-item factor that covered teachers' beliefs across conflict resolution, promotion of positive behaviors and facilitation of student learning. It was the largest out of the three factors obtained (explaining 22% of the total variance). As pointed out earlier, effective classroom management lays the foundation for promoting SEL within the classroom, as it enables students to feel secure, take risks, and acquire new knowledge, thereby optimizing their learning journey (Evertson et al., 2003). The second factor to emerge was *inclusive classroom culture*, comprising 7 items. It assessed teacher's beliefs towards building a classroom culture that values diversity and inclusion. It aligned with existing research which suggests the crucial role of building inclusive environments inside the

Table 5
Multi-factorial invariance analysis of the CSEL by gender (males and females; $N = 1049$).

Model	χ^2	*df*	*p*	CFI	RMSEA	SRMR	$\Delta\chi^2$	Δ*df*	Δ*p*	ΔCFI	ΔRMSEA	ΔSRMR
Model 1: Configural invariance	597.64	174	0.000	0.986	0.068	0.069	-	-	-	-	-	-
Model 2: Metric invariance	703.28	186	0.000	0.983	0.073	0.074	27.94	12	0.005	0.003	0.005	0.006
Model 3: Scalar invariance	702.05	221	0.000	0.984	0.065	0.071	-2.57	35	1.000	0.001	0.008	0.003
Model 4: Residual invariance	743.88	224	0.000	0.983	0.067	0.071	6.58	3	0.086	0.001	0.002	0.000

Note. Models estimated using robust ML estimation. ΔCFI < .01, ΔRMSEA < .015, and ΔSRMR < .030 (for metric invariance) or.015 (for scalar or residual invariance) imply that the invariance holds

classroom. Settings that promote the understanding of inclusion, which is a fundamental aspect of SEL, are essential for the uptake of SEL (Reicher, 2010; Silver, 2020). The final factor identified was *supportive student relationships*, composed of 3 items. It's not surprising that the quality of teacher-student relationships is crucial for promoting SEL within the classroom (Jennings et al., 2021). These relationships establish a safe atmosphere, which is conducive to both academic and SEL development (Silver, 2020). These three factors are not only important individually but also interconnected in creating a holistic SEL-promoting environment (they demonstrate positive inter-correlations). Building an inclusive classroom culture can set the stage by fostering a sense of belonging and acceptance. Supportive student relationships can build on this foundation by providing the emotional support necessary for growth. Finally, healthy classroom management can then ensure that this environment is sustained, allowing SEL to be effectively promoted.

In our examination of convergent validity, we discovered a significant and positive correlation between all subscales of the CSEL and EI (see Table 3), which encompasses a broader set of skills such as self-awareness, self-regulation, motivation and empathy (Goleman, 1996). It is believed that empathetic teachers are better able to understand the diverse backgrounds of their students (McAllister & Irvine, 2002), as well as develop positive student relationships (Aldrup et al., 2022), which is why they may hold a stronger belief in inclusive classroom cultures and supportive student relationships. Similarly, teachers who are emotionally aware are equipped to navigate conflicts and make classroom management decisions with greater ease (Bonilla et al., 2020).

Predictive validity results highlighted a positive association between teacher beliefs and mental well-being. It is suggested that teachers who believe in promoting an inclusive classroom culture invest more time and effort into understanding diverse student needs (Weiner, 2003). Consequently, when they observe their efforts positively impacting students, it is likely that their well-being is also positively affected. Research shows that positive relationships with students can buffer against teacher stress and create a more congenial work environment for them (Csaszar et al., 2018). Similarly, teachers' beliefs towards effective classroom management can also reduce their stress, with well-managed classrooms allowing them to experience greater mental well-being (Kennedy et al., 2021). This is significant considering that challenges with classroom management stand as one of the primary factors leading to teacher attrition (Freeman et al., 2014).

The results of discriminant validity indicated a negative association between teacher beliefs on *healthy classroom management, inclusive classroom culture*, *supportive student relationships* (see Table 3), and the *lack of self-efficacy* subscale of the PSS. Teacher self-efficacy is considered to be a subset of their overall beliefs. Thus, teachers who hold greater beliefs regarding the three factors would feel more confident in their ability to demonstrate them in the classroom (or *vice-versa*). This is consistent with prior studies that have consistently demonstrated positive correlations between teachers' self-efficacy and their beliefs in practicing classroom management (Bay, 2020), building inclusive classrooms (Woodcock & Jones, 2020), and developing supportive relationships (Hajovsky et al., 2020). *Healthy classroom management* was also found to have a small negative association with *perceived helplessness*. It is likely that when teachers believe in practicing healthy classroom management strategies, they will not feel helpless or overwhelmed.

This scale lays the foundation to inform crucial educational areas such as teacher professional development and policy formulation. For instance, based on CSEL data, school districts can help identify teachers that struggle with believing in the significance of inclusive classroom practices to promote SEL and in response, organise targeted professional development workshops that emphasize the need of SEL in the classroom. In terms of policy, education departments could use CSEL results to inform the allocation of resources. If the scale reveals that a significant number of teachers lack confidence in managing classroom dynamics for SEL, the department might allocate funds for specialized training programs focused on classroom management strategies that support SEL. While the scale is designed with the intention of improving teaching, learning, and school systems, it is essential to consider potential unintended consequences. It is crucial to emphasize that the CSEL scale should not be used for punitive measures against teachers. Instead, it should be viewed as a tool for growth and development. Administrators should ensure that the data from the scale is used to provide support and resources rather than punitive actions. Moreover, there is a potential for biases in the interpretation of the scale results. Administrators and policymakers should be mindful of cultural, contextual, and individual differences when analyzing the data. This will ensure that policies are inclusive and responsive to the diverse needs of teachers and students.

6. Limitations and future directions

While we believe that the development of CSEL represents a significant contribution to the field of SEL research, there are a few caveats to be aware of, as well as implications for future research to be noted. To begin, it is important to remember that the results presented in this study were based on teachers' self-reported responses, which can be affected by social desirability, and may differ from their actual beliefs. Second, longitudinal research must be conducted to further determine the scale's predictive validity. Third, the scale's psychometric equivalency must be further investigated by running multi-factor invariance analyses across school communities, gender-diverse populations, and so on. Finally, the study focused on the Indian context, and as such, the generalizability of the scale to other cultural contexts would require further validation.

7. Conclusion

The development and validation of CSEL, a scale focused on measuring teachers' beliefs about factors that promote SEL in classroom, will offer vital insights for future educational strategies in emerging SEL contexts. Understanding these beliefs can guide policymakers in effectively implementing SEL and thus, promoting educational equity.

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CRediT authorship contribution statement

Nandini Chatterjee Singh: Writing – review & editing, Writing – original draft, Supervision, Investigation, Funding acquisition, Conceptualization. **Anya Chakraborty:** Writing – review & editing, Writing – original draft, Investigation, Conceptualization. **Mayank Sharma:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Methodology, Formal analysis.

Declaration of Competing Interest

The authors declare no competing interests.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.sel.2024.100049.

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