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Social-emotional competencies as predictors of empathy in school-aged children and adolescents in Colombia

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ABSTRACT

This cross-sectional retrospective study analyzed secondary data from the PESCOMSE project, comprising 2,961 Colombian students (children: n = 1,228; adolescents: n = 1,733). Social-emotional competencies (SEC) and empathy were measured with the COMSE-N (44 items) and COMSE-A (81 items) questionnaires. Multifactorial ANOVAs—using Welch or Tukey/Games-Howell corrections as appropriate—examined the impact of SEC levels, gender and grade on empathy. Structural Equation Modelling (JASP 0.18.3) assessed latent relationships. Among children, self-efficacy and optimism were the strongest predictors, and the model explained 66 % of empathy variance (β self-efficacy = 0.52; β optimism = 0.34). Among adolescents, trust, self-efficacy, and prosocial behavior dominated, accounting for 75 % of variance (β trust = 0.57). Girls consistently showed higher empathy. Findings reveal developmental shifts in the predictive architecture of empathy and underscore the need for stage-specific interventions: boosting self-efficacy/optimism in childhood and fostering trust/prosocial in adolescence. Results inform evidence-based socio-emotional curricula and violence-prevention policies in Latin American schools.

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1. Introduction

Social-emotional competencies (SEC) have gained increasing relevance in both global and Latin American educational systems due to their implications on empathy, peaceful coexistence, violence prevention, and the shaping of school culture in the development of children and adolescents. Specialized literature agrees that SEC implies a set of skills, attitudes, and knowledge that enables individuals to manage their emotions, relate positively with others, make responsible decisions, and resolve conflicts constructively (Bravo-Andrade et al., 2021; Zych, & Ortega-Ruiz, 2021).

The school context appears to be one of the most effective environments for enhancing these competencies, as students with well-developed SEC demonstrate the ability to regulate their emotions, engage in prosocial behaviors, and reduce bullying, which fosters a safer and more collaborative school environment (Acosta and Amador, 2021; Mosquera, 2024). The implementation of social-emotional programs has been

linked to a decrease in violence and an increase in nonviolent conflict resolution among students (Catalan et al., 2021; Umashankar & Charitra, 2014).

In this context, empathy is presented as a relevant skill in socialization and academic performance. Some authors agree in understanding empathy as the ability to understand and share the feelings of others, which is enhanced by perspective-taking, emotional self-regulation, and assertiveness (LeBlanc et al., 2012; Oettingen & Gollwitzer, 2003). Thus, empathy not only favors social interaction but also reduces aggression and bullying (Agencia de la Calidad de la Educación, 2024; Türk, 2018). Thus, multiple approaches and models articulating emotion recognition and regulation, self-efficacy, emotional expression, optimism, and interpersonal competence, among others, have been integrated to understand SEC (Huerta et al., 2022).

At young ages, COVID-19 and other events have emerged as new challenges to emotional well-being, social interaction, and the development of empathy and SEC, which are mostly influenced by individual, family, school, and community factors (Egea et al. 2022). In this sense, the balance between family and school, the use of innovative teaching techniques such as the use of performing arts and literature, as well as teacher education in the field of emotional intelligence, are key to social-emotional development (Pérez, 2024; Porras et al., 2020; Soto & Rojas, 2025).

Some studies have shown that SEC significantly predicts the development of prosocial behavior and school environment. Competencies such as adaptability, interpersonal relationships, and positive emotions explained up to 24% of the variability in prosocial behavior in adolescents, which supports the view of Bar-On's social-emotional intelligence model regarding self-awareness and awareness of the needs of others and their relationships with constructive and satisfying social interactions (Díazgranados, 2014; Ruvalcaba-Romero et al. 2017).

Some empirical studies have pointed out the relationships between empathy, emotional intelligence, and theory of mind, stating that children who are more advanced in these areas have higher levels of peer acceptance and belong to higher sociometric status (García, 2008; Zuluaga, and Becerra, 2018). In addition, it has been demonstrated that cognitive empathy is related to the understanding of the mental states of others, which helps in conflict resolution and prevention of aggressive behaviors (García et al., 2011; Türk, 2018).

In Latin America, some recent studies highlight the need to include SEC in the school curriculum to improve emotional well-being and academic performance. Palacios and Ramirez (2024) point out that integrating teachers with the educational community is essential to foster these competencies, which improves teamwork and collaboration in academic projects. Although many educational institutions in Colombia and other Latin American countries have only a few integrated social-emotional learning programs that use validated tools to measure the real impact of the programs on dimensions such as cognitive and affective empathy (Bauz et al., 2024; Uribe & Henríquez, 2021). This lack of methodological uniformity hinders educational systems' ability to develop evidence-based interventions and evaluate their effectiveness over time.

There is a broad agreement on the importance of SEC and empathy in school-aged populations. However, research conducted between 2020 and 2024 highlights some remarkable gaps. Challenges remain in their measurement, operationalization, and evaluation, as well as in understanding their interrelationships and differential impact, particularly concerning contextual variables such as gender, family environment, and social vulnerability (Colombia Aprende, 2022; Huerta et al., 2022).

Some studies focus on single age groups without cross-testing predictive pathways using multivariate techniques (Bocanegra, 2024; Mosquera, 2024). This overlooks possible neurocognitive reconfigurations during puberty that may modulate the relationship between SEC and empathy. Other studies measure empathy as a unidimensional construct, without considering its bidimensional nature (affective vs. cognitive). This approach underestimates other contextual variables (Huerta et al., 2022; Türk, 2018; Universidad de Antioquia, 2020).

Few studies incorporate socioecological factors such as the school difficulty index or family cultural capital. For example, Colombian data demonstrate that the effect of self-efficacy on child empathy is attenuated by 41% in contexts of high marginalization ($p < 0.001$), while school-family cooperation adds 33% more effectiveness to programs (Bocanegra, 2024; Pérez, 2024). This gap impedes generalizing the findings to diverse contexts, compounded by the fact that many instruments used in Latin American educational institutions lack psychometric validation, resulting in a gap between student perception and the actual implementation of SEC.

Consequently, recent research employs multivariate strategies to explore the predictive mechanisms of empathy and SEC across different developmental stages (Llorent et al., 2020; Mikulic et al., 2015). Illustrating this relationship has a scientific and social implication, as empathy is a protective factor against disruptive behaviors such as bullying and promotes school coexistence and well-being within educational spaces (Catalán et al., 2021; Mejía et al., 2017; Mosquera, 2024).

This study provides empirical evidence on the emotional aspects that most influence empathy development at different levels of growth, which is determinant for designing differentiated pedagogical strategies and public policies that promote socioemotional skills during childhood and adolescence. Modeling with equation structures addresses the methodological limitations of previous studies, providing a more holistic and rigorous analysis of the phenomenon in contemporary school environments. The objective aims to determine the association between socio-demographic factors and social-emotional competencies with empathy in the school-aged population in Medellín.

2. METHOD

Design

A quantitative study with a cross-sectional-retrospective design, since the study was based on a secondary analysis of the database collected through the administration of the battery of instruments developed within the PESCOMSE research project: Program for the stimulation of social-emotional competencies for school children and adolescents (Redondo et al., 2024).

Sample

The study sample consisted of 2961 students, grouped into two subsamples according to a specific age group: childhood (n = 1228) and

adolescence (n = 1733). Data collection was conducted in official and non-official educational institutions by non-probabilistic convenience sampling. The subsample of children (n = 1228) included students aged 5 to 13 years (M = 9.15, SD = 1.70), with a higher concentration between 8 and 10 years (68.4% of the sample). In terms of gender, 56.35% were boys (n = 692) and 43.65% girls (n = 536). Table 1

Table 1. Distribution ratios by grade and city: children and teenagers

		Children (n = 1228)		Teenagers (n = 1733)	
Category		n	%	n	%
Grade	Fourth	400	32,57		
	Fifth	310	25,24		
	Third	339	27,61		
	Others (Ac°, 0, Pb°, 1°, 2°)	179	14,58		
	Sixth			444	25,62
	Eleventh			317	18,29
	Ninth			291	16,79
	Seventh			208	12,00
	Tenth			111	6,41
	Eighth			110	6,35
	Others (CS_1, CS_2)			252	14,54
City (children)	Medellín	805	65,55		
	Bogotá	251	20,44		
	Villanueva	88	7,17		
	Riohacha	57	4,64		
	Others	27	2,20		
City (teenagers)	Medellín			978	56,43
	Riohacha			278	16,04
	Villanueva			219	12,64
	Bello			188	10,85
	Quibdó			46	2,65
	Others			24	1,38

presents the distribution of the academic grades of the surveyed children along with the city of origin.

The adolescents subsample (n = 1733) included students aged 10 to 20 (M = 14.13, SD = 2.03), with the largest group falling between 13 and 15 years of age. The sample was balanced by gender, consisting of 873 females (50.38%) and 860 males (49.62%).

Instruments

For data collection, a questionnaire to measure social-emotional competencies in students (COMSE) was applied, which consists of two versions: the COMSE-N version for boys and girls between 6 and 11 years of age, and the COMSE-A version for adolescents between 12 and 18 years of age. Both versions are scored on a Likert scale with four possible response options: Always (4), Many times (3), Seldom (2), and Never (1).

In light of the above, the COMSE-N questionnaire consists of 44 items, distributed in six dimensions: First, the emotional awareness dimension, which includes four items and presents an internal consistency of 0.59. Secondly, the emotional regulation dimension, which has five items, shows an internal consistency of 0.73. Third, the emotional expression dimension consists of six items with an internal consistency of 0.8. Fourth, the optimism dimension covers eight items and demonstrates an internal consistency of 0.89. Fifth, the self-efficacy dimension comprises seven items and validates an internal consistency of 0.83. Finally, the empathy dimension includes fourteen items and shows an internal consistency of 0.93.

The COMSE-A questionnaire consists of 81 items distributed in nine central dimensions to measure the social-emotional competencies. First, emotional awareness includes seven items with an internal consistency of 0.82. Second, emotional regulation consists of eleven items and validates an internal consistency of 0.89. Third, emotional expression comprises nine items, with an internal consistency of 0.81. Fourth, confidence consists of eight items with an internal consistency of 0.83. Fifth, optimism with eight items and an internal consistency of 0.87. Sixth, assertiveness with five items and an internal consistency of 0.64. Seventh, assertiveness with twelve items and an internal consistency of 0.90. Eighth, self-efficacy with five items and an internal consistency of 0.81. Lastly, empathy with sixteen items and an internal consistency

of 0.91.

Procedure

Participants and their legal tutors were informed of the methodology and purpose. The tutors were asked to fill out the informed consent form to authorize handling of the personal data of the adolescents and children selected for the research, in compliance with the ethical standards required for research involving minors. Finally, the children and adolescents respectively completed the COMSE-N and COMSE-A questionnaires.

3. Data analysis

An analytical strategy was designed that combined descriptive, inferential, and structural modeling statistical methods. The analysis was conducted separately for children and adolescents due to the difference in the instruments applied and the composition of the data.

In both groups, an exploratory analysis to verify assumptions of normality and homogeneity of variance was initiated. Subsequently, a multifactorial analysis of variance (ANOVA) model was proposed as the dependent variable to empathy and social-emotional competencies as independent factors categorized into three levels (low, medium, and high). Sociodemographic variables such as gender and school grade were also included. Initially, age was considered a covariate through an analysis of covariance (ANCOVA); however, it was not significant in any group, so it was excluded from the main analysis.

In the children's group, since the assumption of homogeneity of variances was not met (as indicated by the significant Levene's test), the Welch correction was applied to the ANOVA, and the Games-Howell post-hoc test, suitable for this condition, was used. In contrast, for adolescents, the data met the parametric assumptions, allowing the application of conventional ANOVA and post-hoc comparisons with Tukey's test.

Finally, structural equation modeling (SEM) was implemented in both. This approach allowed the evaluation of the underlying structure between emotional variables and the relative weight of each dimension to predict empathic behavior. The data were analyzed in JASP statistical software (version 0.18.3.0).

Ethical considerations

The research was conducted according to the principles of international and national standards, including the Nuremberg Code, the Universal Declaration of Human Rights, the Helsinki Declaration, the Belmont Code, the International Council of Nurses, and the World Health Organization. Additionally, it adheres to the Colombian Code of Conduct and Ethics, Law 1090, and Resolution 8430 of the Ministry of Health, which regulates professional, scientific, technological, and administrative practices (Ministry of Health, 1993). The approval by the ethics committee of San Buenaventura University was received on May 4th, 2022, and the secondary use of the database was approved on March 4th, 2025, by the Alexander von Humboldt University Corporation.

Results

According to the general objective and analytical strategy, the results were presented in two subgroups (children and adolescents) where variance analysis models were applied, followed by the structural equation model, including their respective effects.

In the children's group (n = 1228), a multifactorial analysis of variance model (ANOVA with Welch correction) was first conducted, after discarding the analysis of covariance (ANCOVA) originally proposed. This decision was based on the non-significance of age as a covariate (p = .68), which led to a model that would permit a clearer identification of emotional and sociodemographic effects on empathy, which are grouped in Table 2. Statistically significant effects are observed for gender, including the emotional variables: emotional awareness, emotional regulation, emotional expression, optimism, and self-efficacy. In contrast, school grade showed no significant effect on empathy ($F(7,1209) = 0.70$; $p = ,66$; $\eta^2p = ,004$). The factors with the largest effect sizes were self-efficacy ($F(2,1209) = 90.32$; $p < ,001$; $\eta^2p = ,13$) and optimism ($F(2,1209) = 65.57$; $p < ,001$; $\eta^2p = ,10$). Moderate effects of emotional expression ($\eta^2p = ,02$) and emotional awareness ($\eta^2p = ,02$) were also found.

Table 2. Effect of sociodemographic variables and emotional competencies on empathy: children.

Factor	Level	n	M	DT	F*	p	η^2 parcial
Genre	Male	692	46,27	6,76	11,6	< ,001	0,009
	Female	536	47,47	6,51			
School grade	Ac°	37	43,86	6,79	0,7	0,66	0,004
	Zero	69	49,48	6,03			
	Fourth	400	46,3	6,94			
	Pb°	27	46,07	6,22			
	First	16	47,5	5,34			
	Fifth	310	46,28	6,67			
	Second	30	48,27	6,6			
	Third	339	47,52	6,37			
Emotional awareness	Low	168	44,24	7,82	14,4	< ,001	0,02
	Medium	642	45,79	6,73			

	High	418	49,37	5,13			
Emotional regulation	Low	153	43,36	8,05	5,41	0,004	0,009
	Medium	480	45,5	6,58			
	Hight	595	48,73	5,7			
Emotional expression	Low	285	43,92	7,59	10,92	< ,001	0,02
	Medium	405	46,04	6,26			
	High	538	48,89	5,72			
Optimism	Low	11	26,73	9,51	65,57	< ,001	0,1
	Medium	199	41,74	6,61			
	High	1018	48	5,8			
Self-efficacy	Low	38	35,03	10,05	90,32	< ,001	0,13
	Medium	432	43,64	6,3			
	High	758	49,18	5,14			

Note: * Anova with Welch's correction. Own elaboration

Games-Howell post-hoc tests were conducted to identify differences in levels of the emotional variables, which are summarized in Table 3. In all cases, empathy scores were significantly higher at high levels compared to medium and especially low levels.

Table 3 Games-Howell post-hoc comparisons for the empathy variable

Comparision	**Mean difference**	**p**
Male - Female	−1,19	,002 **
Emotional Awareness		
High - Low	5,12	< ,001 ***
High - Medium	3,58	< ,001 ***
Low - Medium	−1,54	,050 *
Emotional Regulation		
High - Low	5,37	< ,001 ***
High - Medium	3,23	< ,001 ***
Low - Medium	−2,14	,009 **
Emotional expression		
High - Low	4,97	< ,001 ***
High - Medium	2,84	< ,001 ***
Low - Medium	−2,13	< ,001 ***
Optimism		
High - Low	21,27	< ,001 ***
High - Medium	6,26	< ,001 ***
Low - Medium	−15,02	< ,001 ***
Self-efficacy		
High - Low	14,16	< ,001 ***
High - Medium	5,54	< ,001 ***
Low - Medium	−8,61	< ,001 ***

It was observed that children with high optimism reported higher levels of empathy (M = 48.00; SD = 5.80) than those with medium (M = 41.74; SD = 6.61) or low (M = 26.73; SD = 9.51) levels, with higher differences than 6 and 21 points, respectively (p < ,001). This same trend was evident for self-efficacy, where the differences were also marked (p < ,001). Regarding gender, it was found that girls showed higher

levels of empathy than boys (p = ,002).

A structural equation model (SEM) for participating boys and girls was constructed to explore the structural relationships between social-emotional competencies and empathy. Based on this multivariate approach, the aim was not only to assess the direct contribution of each of these dimensions to empathy, but also to consider the influence of gender as an exogenous variable in the model.

The model demonstrated an adequate fit with a comparative fit index (CFI) and a Tucker-Lewis index (TLI) of 0.98. The RMSEA was 0.03 with a 90% confidence interval between 0.03 and 0.03, and a p-value of 1.00. These indicators reflect a close to ideal fit, which reinforces the structural model consistency. In addition, the SRMR was 0.04, which complemented the evidence of good fit. The determination coefficient (R^2) for the empathy latent construct was 0.66 for children, indicating that the model explains 66% of the variance in children's empathy levels.

Table 4 presents the standardized regression coefficients of the latent factors on empathy. As can be seen, the most significant predictors were self-efficacy (β = 0.52; p < ,001) and optimism (β = 0.34; p < ,001), followed by emotional awareness (β = 0.16; p < ,001). Emotional regulation presented a significant inverse relationship (β = -0.11; p = ,002), while emotional expression did not show a statistically significant relationship (β = 0.01; p = ,580). In addition, gender presented a direct effect on empathy (β = 0.20; p < ,001), indicating higher levels in girls.

Table 4 Standardized regressions to the latent variable of empathy in children.

Predictor	β standardized (LV)	Standard error	z	*p*	IC 95%
Self-efficacy	0,52	0,03	18,8	< ,001	[0,52, 0,64]
Optimism	0,34	0,03	13	< ,001	[0,30, 0,41]
Emotional Awareness	0,16	0,05	5	< ,001	[0,16, 0,36]
Emotional Regulation	–0,11	0,04	– 3,09	0,002	[–0,22, – 0,05]
Emotional Expression	0,01	0,04	0,55	0,58	[–0,06, 0,11]
Genre (0 = boy, 1 = girl)	0,2	0,02	7,14	< ,001	[0,10, 0,18]

Regarding adolescents (n = 1740), an analysis of covariance (ANCOVA) model was also explored, including age as a covariate. However, the results indicated that age was not a significant predictor of empathy levels (p = ,800). Therefore, an ANOVA model was chosen.

The findings show statistically significant differences in the empathy levels of adolescents as a function of gender and various social-emotional competencies. In particular, gender had a significant effect (F (1,1730) = 26.20; p < ,001), showing that female adolescents tend to have higher levels of empathy (M = 50.59; SD = 7.04) than their male peers (M = 49.52; SD = 6.98).

Regarding the social-emotional competencies whose results are observed in Table 5, the factors that explained a greater proportion of the variance in empathy were prosocial behavior (F(2, 1730) = 24.38; p < ,001; η^2p = ,043), assertiveness (F(2, 1730) = 28.35; p < ,001; η^2p = ,043), and self-efficacy (F(2, 1730) = 32.16; p < ,001; η^2p = ,036), suggesting that adolescents with higher levels in these competencies also present a greater ability to understand and resonate with others' emotions. Likewise, moderate effects were identified in emotional expression (η^2p = ,020) and emotional awareness (η^2p = ,015). School level was originally included but not reported since the differences between modalities were not representative.

Table 5. Effect of sociodemographic variables and emotional competencies on empathy: teenagers.

Factor	Leven	n	M	DT	F	p	η^2 parcial
Genre	Male	860	49,52	6,98	26,2	< ,001	0,023
	Female	873	50,59	7,04			
Emotional awareness	Low	43	42,58	9,44	18,47	< ,001	0,015
	Medium	576	47,21	6,71			
	High	1121	51,79	6,47			
Emotional regulation	Low	132	44,55	8,38	7,12	0,001	0,008
	Medium	628	47,93	6,32			
	High	980	52,14	6,53			
Emotional expression	Low	200	45,2	8,4	17,48	< ,001	0,02
	Medium	1020	49,16	6,58			

	High	520	53,64	5,65			
Confidence	Low	21	37,57	10,46	12,8	< ,001	0,015
	Medium	653	46,43	6,79			
	High	1066	52,51	5,85			
Optimism	Low	26	37,19	9,36	7,55	0,003	0,007
	Medium	504	45,05	5,89			
	High	1210	52,4	6,01			
Assertiveness	Low	243	44,23	7	28,35	< ,001	0,043
	Medium	1029	49,8	6,14			
	High	468	53,61	6,89			
Prosocial behavior	Low	65	38,45	7,33	24,38	< ,001	0,043
	Medium	404	45,36	6,13			
	High	1271	52,13	5,97			
Self-efficacy	Low	116	40,73	7,88	32,16	< ,001	0,036

Tukey's post-hoc tests were conducted to identify variable levels at which significant differences in empathy scores were present. The results in Table 6 show a consistent pattern: adolescents with high levels of social-emotional competencies present higher levels of empathy than their peers with low and medium levels.

Table 6 Tukey's post-hoc comparisons for the empathy variable in teenagers.

Comparison	Mean difference	p
Genre		
Male - Female	-1,07	< ,001 **
Emotional awareness		
High - Low	9,21	< ,001 ***
High-Medium	4,58	< ,001 ***
Medium-Low	4,62	< ,001 ***
Emotional Regulation		
High - Low	7,59	< ,001 ***
High - Medium	4,21	< ,001 ***
Medium - Low	3,38	< ,001 ***
Emotional Expression		
High - Low	8,44	< ,001 ***
High - Medium	4,48	< ,001 ***
Medium - Low	3,96	< ,001 ***
Confidence		
High - Low	14,94	< ,001 ***
High - Medium	6,07	< ,001 ***
Medium - Low	8,86	< ,001 ***
Optimism		
High - Low	15,21	< ,001 ***
High - Medium	7,35	< ,001 ***
Medium - Low	7,86	< ,001 ***
Assertiveness		
High - Low	9,38	< ,001 ***
High - Medium	3,81	< ,001 ***
Medium - Low	5,57	< ,001 ***
Prosocial behavior		
High - Low	13,68	< ,001 ***

High - Medium	6,77	< ,001 ***
Medium - Low	6,91	< ,001 ***
Self-Efficacy		
High - Low	12,48	< ,001 ***
High - Medium	5,58	< ,001 ***
Medium - Low	6,89	< ,001 ***

Differences in self-efficacy, prosocial behavior, and trust are especially noteworthy, where significant differences of more than 12 points were observed between high and low levels (p <,001). For example, adolescents with high self-efficacy reported markedly higher levels of empathy (M = 53.22) compared to those with low self-efficacy (M = 40.73).

These differences were replicated in variables such as emotional regulation, emotional awareness, emotional expression, assertiveness, and optimism. In all cases, the differences between levels were significant, reflecting a clear emotional gradient: the greater the emotional development, the higher the levels of empathy. Gender was also a relevant factor, showing significant differences between men and women (p < ,001). These latter variables exhibited the highest empathy scores, consistent with the patterns observed in the group of children.

Finally, a structural equation model (SEM) was constructed, including emotional awareness, emotional regulation, emotional expression, trust, optimism, assertiveness, prosocial behavior, and self-efficacy as latent factors, with empathy as the dependent variable. Additionally, gender was included as an exogenous variable for the adolescent group.

The model presented an acceptable, although not optimal, fit. The comparative fit index (CFI = 0.88) and Tucker-Lewis fit index (TLI = 0.88) were just below the conventional cut-off point of 0.90. The root mean square error of approximation (RMSEA = 0.09) suggests a reasonable, although not ideal, fit with an SRMR of 0.09. While these values do not indicate an excellent fit, they are acceptable in applied contexts with large samples and complex structures, especially considering the multidimensional nature of the construct.

The determination coefficient (R^2) for empathy was 0.75, indicating that the model explains 75% of the variance in empathy levels in adolescence, a considerably high value that supports the relevance of the proposed theoretical model.

Table 7 presents the standardized regression coefficients towards the empathy construct. It is observed that the most relevant predictors were trust (β = 0.57; p < ,001), self-efficacy (β = 0.22; p = ,04), and prosocial behavior (β = 0.21; p = ,04). Gender also showed a significant effect on empathy (β = 0.14; p < ,001), with female adolescents presenting higher levels of empathy. Unlike the findings obtained in children, in adolescents, variables such as emotional awareness, regulation, expression, assertiveness, and optimism did not show statistically significant effects in this structural model, which suggests a change in emotional dynamics at this developmental stage.

Table 7 Standardized regressions to the latent variable of empathy in children.

Predictor	β standardized (LV)	Standard error	z	p	IC 95%
Emotional awareness	−0,02	0,04	−0,78	0,44	[−0,12, 0,05]
Emotional regulation	−0,04	0,03	−1,11	0,27	[−0,10, 0,03]
Emotional expression	0,03	0,06	0,83	0,41	[−0,07, 0,17]
Confidence	0,57	0,12	4,65	< ,001	[0,34, 0,83]
Optimism	−0,16	0,1	−1,42	0,16	[−0,32, 0,05]
Assertiveness	0,14	0,09	1,77	0,08	[−0,02, 0,34]
Prosocial behavior	0,21	0,1	2,09	0,04	[0,03, 0,84]
Self-efficacy	0,22	0,12	2,11	0,04	[0,02, 0,47]
Gender (0 = male, 1 = female)	0,14	0,02	5,74	< ,001	[0,06, 0,12]

4. Discussion

The findings indicate differentiated prediction patterns according to age, which is very important for understanding social-emotional development and age-appropriate educational interventions.

Developmental differences in the prediction of empathy

The results remark on differences between children and adolescents in the prediction of CSE, which reflects the evolution and context of

social-emotional development. The strongest predictors were self-efficacy (β = 0.52) and optimism (β = 0.34) for children, whereas for adolescents, they were trust (β = 0.57), self-efficacy (β = 0.22), and prosocial behavior (β = 0.21).

These findings are consistent with the developmental perspective presented by Egea et al. (2022), who emphasize that the development of empathy and other socioemotional competencies is shaped by individual, familial, and contextual factors throughout life. The transition from childhood to adolescence is associated with neurobiological and cognitive changes in empathy and its underlying mechanisms (Zych & Ortega-Ruiz, 2021).

The relevance of self-efficacy as a predictor of empathy is supported by Türk (2018), who found that children with higher self-efficacy are more confident to engage in socially sophisticated interactions involving nuanced emotional understanding. Optimism reflects what Bauz et al. (2024) refer to as "positive emotional disposition," essential for openness toward others and the manifestation of prosocial behaviors.

Trust appears as an important predictor in adolescence, followed by self-efficacy and prosocial behavior. This pattern corresponds to the importance of interpersonal relationships and social identity. As Bravo-Andrade et al. (2021) point out, SES in adolescence acts as a catalyst for positive youth development, aiding social integration and identity formation.

The emergence of trust as a predominant predictor of empathy for adolescents can be explained according to Colombia Aprende (2022), which emphasizes trust in oneself and others as fundamental for any genuine empathic relationship. Furthermore, prosocial behavior as a predictor supports the statement by Ruvalcaba-Romero et al. (2017) that SES predicts prosocial behavior and contributes to a positive school climate among adolescents.

The Role of Gender in Predicting Empathy

Another finding is the influence of gender on empathy, with girls and adolescents demonstrating higher empathy than their male counterparts. Porras et al. (2020) reported gender differences in emotional intelligence and empathy across various educational settings. These differences can be explained by the concept of differential socialization patterns, proposed by Garcia (2008) and Garcia et al. (2011) regarding the theory of mind and mirror neurons.

The magnitude of the gender impact was moderate in the two groups (β=0.20 children, β=0.14 adolescents), indicating a significant difference in the research context. These are useful findings for socio-educational programs focused on empathy. Understanding the predictors permits tailoring these programs to the children and adolescents' needs.

Educational and preventive implications

Interventions should be focused on the development of self-efficacy and optimism to foster empathy in children. These findings coincide with the proposition of Pérez (2024), who stresses the need to strengthen school-family relationships to foster these competencies from an early age. As this author points out, the synergy between these two contexts substantially improves the effectiveness of social-emotional development programs.

Interventions should be focused on building confidence, self-efficacy, and prosocial behavior in adolescents. In this regard, Carrascal (2024) emphasizes training teachers in social-emotional competencies, enabling them to design, implement, and evaluate educational activities. In addition, Acosta and Amador (2021) state that fostering these skills significantly helps in the prevention of cyberbullying and other forms of violence in schools.

The effectiveness of intervention programs, as stated by Catalan et al. (2021), depends largely on their ability to promote the most important factors at each stage of development. Therefore, the results of this research evidence the need to articulate interventions around SEC, such as self-efficacy, optimism, trust, and prosocial behavior, which in childhood and adolescence predict the development of empathy.Limitations and future lines of research

Some limitations emerging from this study need to be addressed. First, the cross-sectional nature of the research does not allow causal inferences between social-emotional competencies (SEC) and empathy. Future research should consider adopting longitudinal designs to explain how this relationship is developed, as suggested by Mikulic et al. (2015); second, contextual variables such as socioeconomic level, family structure, or cultural capital were not analyzed; and third, limitation is related to the measurement instruments. Although tools with established validity criteria were used, future studies should adopt a methodological approach that combines participants' self-reports with direct observations and independent evaluations to provide a more comprehensive perspective on empathy and social-emotional competencies (SEC). This need aligns with Huerta et al. (2022) on the importance of diversifying assessment.

Future studies can be focused on the relation between socioecological factors, social-emotional competencies and the development of empathy. As a result, the effect of self-efficacy on children's empathy is diminished in highly marginalized contexts, as noted by Bocanegra (2024). In this regard, Palacios and Ramirez (2024) propose an active involvement of teachers and the educational community in the development of intervention strategies.

5. Conclusions

The results not only corroborate the existence of different patterns in the prediction of empathy across developmental stages but also contribute to building a more nuanced understanding of how emotional architecture is reconfigured during the transition from childhood to adolescence. Identifying the predictive mechanisms of empathy has important implications for the design of educational policies and intervention strategies aimed at fostering holistic development in children and adolescents within contemporary school environments. These competencies not only reinforce individual well-being, but more importantly, promote to the creation of inclusive, participatory, and healthy educational settings..

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