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Marco Andrea Piombo[1*], Elena Trombini[2] , Maria Stella Epifanio[1] , Sabina La Grutta[1], Federica Andrei[2]

[1] *Department of Psychology, Educational Science and Human Movement, University of Palermo, Palermo, Italy.*

[2]*Department of Psychology" Renzo Canestrari", Alma Mater Studiorum – University of Bologna, Italy*

*Correspondence: marcoandrea.piombo@unipa.it

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Ethics approval

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Data availability statement

The raw data supporting the conclusions of this article will be available upon request by the authors without undue reservation.

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ABSTRACT

Internalizing symptoms emerge early and can negatively affect engagement and achievement during the primary-school years. At the same time, children's socio-emotional competencies may shape how they appraise and regulate school-related stress.

This cross-sectional study tested whether Trait Emotional Intelligence (trait EI) and Social Intelligence(SI) are associated with anxiety and depressive symptoms and academic/behavioral outcomes, and whether these competencies distinguish clinical vs. non-clinical internalizing levels. Participants were 228 Italian primary-school children (8–11 years). Measures included the TEIQue-CSF (trait EI), a child-adapted TSIS (SI: Social Awareness, Social Information Processing, Social Skills), the Anxiety Scale Questionnaire for Children (scholastic anxiety), the Children's Depression Inventory (depression; clinical cut-off = 19), teacher-reported grades (Italian, English, Mathematics), and behavior ratings. Analyses comprised correlations, binomial logistic regressions predicting clinical status, and hierarchical multiple regressions for grades and behavior.

Higher trait EI was inversely related to scholastic anxiety and depression and reduced the odds of meeting clinical criteria for both outcomes. SI showed weaker, facet-specific links: Social Information Processing was the most informative SI dimension for Mathematics grades. Trait EI predicted higher language grades (Italian and English), whereas associations with behavior ratings were small or non-significant.

Findings highlight trait EI as a school-relevant protective correlate of internalizing symptoms in late childhood, while suggesting that Social Intelligence relates more to academic performance. Implications for brief, classroom-based socio-emotional learning are discussed.

Keywords: Trait emotional intelligence; Social intelligence; Anxiety; Depression; Primary school; Academic Grades

1. Introduction

The construct of Emotional Intelligence (EI) has been largely studied among the psychological variables involved in children's physical and emotional well-being. Particularly, there's evidence that EI exerts its impact as a relevant predictor for a better scholastic adaptation during psychosocial development (Russo et al., 2012; Petrides et al., 2018).

EI is generally defined as a set of psychological attributes that capture individual differences in how we perceive, communicate, regulate, and understand our own emotions, as well as the emotions of others (Hughes & Evans, 2018). Though the literature considers EI as an umbrella term that includes different theoretical formulations, one of the most widely used models with children is the trait model (Petrides & Funham, 2000). Trait EI is conceptualized as a lower-order personality construct defined as a constellation of self-emotional perceptions and behavioral dispositions (Petrides, Pita & Kokkinaki, 2007), and has proven to be a relevant predictor of many phenomena linked to good physical and psychological health (Petrides, 2010; Petrides & Furnham, 2021). For instance, several studies show that trait EI can promote better psychological well-being and social interaction during childhood (Andrei et al., 2014; García-Sancho, Salguero, & Fernández-Berrocal, 2014; Perera & DiGiacomo, 2015), and individual differences in trait EI can be relevant for a positive adaptation, emotional competence, and socio-emotional behavior (Frederickson, Petrides & Simmonds, 2012; Mestre et al., 2019; Piqueras et al., 2019) within the school context.

Trait EI starts its development in middle childhood (8-10 years old) when children increase their autonomy and show advancement in their emotional functioning (Saarni, 2000; Keefer, 2013). At this age, children increasingly show introspection on their emotional skills, and that is exactly the moment of life at which children develop the affective aspects of personality, such as perceptions of emotions that allow integrating Trait EI within a person's self-image (Petrides, 2009; Mancini & Trombini, 2017).

Current literature focuses mainly on the relationship between trait EI and academic performance and shows that individual differences in trait EI can both affect scholastic achievement and moderate the path from cognitive intelligence to scholastic success (Mavroveli et al., 2009; Hansenne e Legrand, 2012; Mc Cann et al., 2020; Pauletto et al., 2021). Overall, these studies show that the impact of trait EI on scholastic results is modest. Some studies report that trait EI variability emerges only in academic subjects involving a greater emotional demand, such as math (Agnoli et al., 2012), while other studies show that trait EI is positively related to language subjects (Mavroveli et al., 2009; Andrei et al., 2015; Li &Shi, 2019). Such mixed evidence can be due to cultural factors which in turn affect education systems and grading scales.

Besides tasks and learning, classrooms represent the context for the first experiences with social acceptance and rejection (Rubin, Bukowski & Parker, 2007), as well as for the development of the relationships between classmates, which are crucial components of scholastic well-being (Cillessen & Mayeux, 2004; Gifford-Smith & Brownell, 2003). Therefore, even social abilities that are included in the construct of Social Intelligence (SI) can be considered relevant to children's well-being. SI is currently defined as a set of cognitive, emotional, and behavioral abilities that individuals can use to interpret events, plan their lives, achieve personal and social goals, and solve personal and interpersonal problems (Gulotta & Boi, 1994). The construct of SI is close to notions such as social skills and competence (Gini, 2008), as well as to other forms of intelligence, including EI and interpersonal intelligence (Gardner, 1993). EI and SI are related but not interchangeable (Cabello & Fernandez Berrocal, 2019), and high levels of one attribute do not necessarily imply high levels of the other. EI focuses on the individual's ability to manage their own and others' emotions, and to form positive relationships with others, while SI focuses on the capability to navigate complex social situations and understand the motivations of others (Lievens & Chan, 2017). Both constructs are important for success in personal and professional settings, and individuals with high levels of both EI and SI are likely to be more effective in their interactions with others (Brackett et al., 2011; Pabian & Vandebosch, 2016; Reddy,2021) and trait EI and SI may protect the child against the onset and the maintenance of some clinical symptoms such as anxiety and depression (Davis, Nowland & Qualter, 2019; Lepore & Kliewer, 2019). Nevertheless, although trait EI and SI have been widely studied from several psychological perspectives (e.g., clinical, social, and occupational), the study of SI is currently limited by both definitional and operational problems. However, the literature lacks studies involving children.

For these reasons, it is crucial to expand the research on developmental age, especially regarding the effect that good socio-emotional functioning could have on the prevention of some clinical conditions, such as anxiety and depression, that could act as risk factors for children's well-being. Specifically, in the educational context, these symptoms are indeed associated with many psychosocial problems, including an increased risk of academic and social difficulties during childhood and adolescence (Hammen, Brennan, Keenan-Miller & Herr, 2008; Owens et al., 2012). These conditions can lead to various emotional and behavioral problems that can significantly impact a child's academic performance (McCurdy et al., 2022). In particular, scholastic anxiety, related to the educational context, can manifest in multiple ways, such as excessive worry, fear, and nervousness about tasks, peers, and teachers, making it challenging for children to focus on their studies (Beilock, Schaeffer, & Rozek, 2017). On the other hand, depression can cause feelings of sadness, hopelessness, and low self-esteem, leading to a lack of motivation and decreased interest in

learning (World Health Organization, 2021). Children experiencing anxiety and depression may find it difficult to attend school regularly, participate in classroom activities, and maintain good grades, ultimately affecting their academic success (McCurdy et al., 2022). The impact of anxiety and depression on primary school children's academic results is a topic of concern, as it can have long-term effects on their educational and personal development. Therefore, it is essential to understand the underlying causes of these problems and the possible protective factors, such as trait EI and SI, which could help implement appropriate interventions to support primary school children.

The present study is the first of a larger research project aimed at exploring the relationship between trait EI and SI, and evaluating their effect within primary school contexts. This study aimed to explore sex differences among trait EI and SI in children and their relationship with other variables relevant to psychological well-being (i.e., depression and anxiety) and academic results. Two more specific hypotheses were developed:

Hypothesis 1. Trait EI and SI will distinguish clinical from non-clinical levels of depression and scholastic anxiety, controlling for age and sex.

Hypothesis 2. Trait EI and SI will significantly predict better academic results and behavioral ratings.

2. Method

2.1. Participants and procedure

The present study has a cross-sectional design involving 228 children aged 8-11 years (115 females; Mean age = 9.57; SD = .62) from three primary schools located in Italy. Power analysis was performed with G* Power 3.1 Software to determine the minimum total sample size required for this study, and the results showed that at least 129 participants were needed for the purposes of our study. Participants were recruited with regular permission from each school's principals and after the completion of informed consent by parents. Data collection was carried out in groups in the classroom during regular class time and lasted about 60 minutes. The study was conducted in accordance with the Declaration of Helsinki and was approved by the Bioethics Committee of the last author's institution (Prot. n. 322763/2021).

2.2. Measures

2.2.1 Trait Emotional Intelligence

The Trait Emotional Intelligence Questionnaire Child Short Form (TEIQue-CSF; Mavroveli, Petrides, Shove, & Whitehead, 2008) in its validated Italian version (Russo et al., 2012) was employed for Trait EI. This brief version comprises 36 items responded to on a 5-point scale (1= *strongly disagree*, 5= *strongly agree*). Example items include: "*It is easy for me to understand how I feel*" and "*It's easy for me to talk about my feelings"*. Scores were computed as the mean of the items providing a global trait EI score; higher scores indicate higher trait EI. In this study, this questionnaire has shown good reliability (Cronbach's alpha = .85)

2.2.2. Social Intelligence

A modified and simplified version of the Italian form of the Tromsø Social Intelligence Scale (TSIS; Gini & Iotti, 2008) was used to assess SI. The original scale consists of 21 items rated on a 7-point scale that evaluate a series of abilities related to SI and are divided into three subscales: Social Information Processing (SP), Social Skills (SS), and Social Awareness (SA). The version we used was simplified in the items' syntax to make them more understandable to children, and response scale was changed from 7 to 5 points (from "*Describes me extremely poorly*" to "*Describes me extremely well"*). Example items include: "*I can tell how my classmates are feeling*" and "*I am good at making friends with new people*". Subscale scores (Social Awareness, Social Information Processing, Social Skills) were computed as a sum for each subscale; higher scores indicate higher social intelligence. The reliability of two subscales was acceptable: Social Information Processing (Cronbach's alpha = .74), and Social Skills *(*Cronbach's alpha = .76), while Social Awareness's internal reliability was sufficient (Cronbach's alpha = .60)

2.2.3. Scholastic Anxiety

The Italian version of the Anxiety Scale Questionnaire for Children (Busnelli, Dell'Aglio, Faina, 1974) was used to assess anxiety symptoms. It consists of 45 questions that children are asked to respond to the frequencies they occur (never, sometimes, always) and provides three scores: general anxiety, scholastic anxiety, and total anxiety. Example items include: "*When the teacher asks you to recite the lesson, does your heart pound? Do you have dreams in which a teacher is angry with you because you have not studied?".* To assess anxiety risk, scores were divided into two levels (non-clinical and clinical) based on symptom severity. Clinical status was defined a priori as ≥ 75th percentile on age-/sex-appropriate norms (manual consistent). For the purpose of this study, only the subscale of scholastic anxiety was used, and its reliability was good (Cronbach's alpha = .85).

2.2.4. Depression

The Italian version (Camuffo, Cerutti, Lucarelli, & Mayer, 1988) of the Children's Depression Inventory (CDI; Kovacs, 1988) was used to assess depression levels. It is a 27 Likert-like scale, with severity scores ranging from 0 (absence of symptoms) to 2 (definite symptom), and yields total scores from 0 to 54, with higher scores reflecting greater symptomatology. Example items include: "*I am sad once in a while / many times / all the time*" and "*Many things are fun / some things are fun / nothing is fun*.". To evaluate depression levels, the cut-off of 19 was used according to the Italian norms (Kovacs, 1992), namely, scores < 19 indicate non-clinical risk of depression, while scores > 19 indicate clinically significant levels of depression. The CDI's reliability was good (Cronbach's alpha = .86).

2.2.5. Academic Performance and Behavior

Academic performance in Italian, English, and Math, and children's behavior ratings were measured through the children's final school grades provided by teachers. In the current Italian primary school education system, for each subject, including school behavior, teachers evaluate children along three different levels (basic, intermediate, and advanced). The global ratings about behavior result from a means of different parameters provided by the teachers, such as compliance with the rules, participation in class, socialization, academic effort, and motivation.

2.3. Statistical analyses

Statistical analyses were performed using IBM SPSS Statistics 25. Sex was coded as a dummy variable (0 = female, 1 = male), and school grades were coded as 1 = basic, 2 = intermediate, and 3 = advanced. Bivariate associations among study variables were examined using Pearson product–moment correlations. Sex differences in socio-emotional variables, internalizing symptoms, and academic/behavioral outcomes were tested with one-way analyses of variance (ANOVAs) and χ^2 tests, as appropriate. To test Hypothesis 1, two binomial logistic regression models were estimated, with clinical status on scholastic anxiety and on depression (0 = non-clinical, 1 = clinical), respectively, as dependent variables, and sex, trait EI, and the three SI dimensions as predictors. To test Hypothesis 2, multiple hierarchical linear regression models were conducted, with sex entered at Step 1 and trait EI global score and the TSIS dimensions entered at Step 2, predicting academic results (Italian, English, and Mathematics grades) and behavioral ratings as continuous outcomes.

In line with the scoring instructions for the TEIQue-CSF and the child-adapted TSIS, items left unanswered were recoded to the midpoint of the 1–5 response scale (3). When a child did not complete an instrument, the corresponding scale score was treated as missing. All inferential analyses

used listwise deletion (complete-case analysis): participants with missing data on any variable included in a given model were excluded from that analysis.

For the multiple regression models predicting Italian, English, Math, and Behavior, we inspected histograms and normal P–P plots of standardized residuals to evaluate normality, and scatterplots of standardized residuals versus standardized predicted values to assess linearity and homoscedasticity. Across models, standardized residuals were approximately normally distributed, and the residual-versus-predicted plots did not reveal funnel-shaped or clearly curvilinear patterns, indicating no significant violations of the normality or homoscedasticity assumptions. We also examined multicollinearity in the multiple regression models by inspecting Variance Inflation Factors (VIFs) and tolerance values. Across the models, VIFs ranged from 1.01 to 1.64, with all tolerance values above .60, which indicates no problematic multicollinearity among the predictors. Finally, for the binary logistic regression models (clinical anxiety and clinical depression), we evaluated linearity in the logit for each continuous predictor (trait EI, the three social intelligence dimensions, and age) using the Box–Tidwell procedure, by entering interaction terms between each predictor and its natural logarithm. None of these interaction terms was statistically significant (for clinical anxiety, *ps* = .12–.68; for clinical depression, *ps* = .27–.92), indicating that the logit assumption of linearity was reasonably met. Finally, model calibration was also acceptable according to the Hosmer–Lemeshow goodness-of-fit test (clinical anxiety: $\chi^2(8) = 2.79$, p = .94; clinical depression: $\chi^2(8) = 10.28$, p = .24).

3. Results

Descriptive information of the sample is reported in Table 1. The only significant sex difference was found with respect to academic results: girls showed a significantly higher number of advanced levels than males in language subjects (Italian: $\chi^2 = 8.31$; $p < .05$ and English: $\chi^2 = 10.91$; $p < .01$) and behavior ($\chi^2 = 21.34$; $p < .00$), while no significant sex difference in math was detected ($p > .05$).

Table 1. *Descriptive information and sex differences in the sample*

	Females (n=115)	Males (n=113)	Total (n=228)	F/χ^2
Grade[a]				0.85
4th	49(42.6)	41(36.6)	90(39.5)	
5th	66(57.4)	71(63.4)	138(60.5)	
Age[b]	9.48(0.5)	9.66(0.6)	9.57(0.6)	4.95*

Trait EI[b]	3.58(0.5)	3.54(0.5)	3.56(0.5)	0.32
SI[b]				
Social information processing	22.6(6.2)	21.2(5.2)	21.9(5.8)	2.99
Social Skills	24.2(6.1)	23.4(5.7)	23.8(5.9)	1.06
Social Awareness	24.4(4.6)	23.3(4.6)	23.8(4.6)	2.68
Scholastic Anxiety[a]				0.51
Non-clinical	85(73.9)	78(69.6)	164(71.9)	
Clinical	30(26.1)	34(30.4)	64(28.1)	
Depression[a]				0.73
Non-clinical	99(86.1)	95(84.8)	195(85.5)	
Clinical	16(13.9)	17(15.2)	33(14.5)	
Italian[a]				8.31*
Basic	4(3.8)	7(6.8)	11(5.3)	
Intermediate	29(27.9)	46(44.7)	75(36.2)	
Advanced	71(68.3)	50(48.5)	121(58.5)	
English[a]				10.91**
Basic	2(2.0)	11(10.7)	13(6.3)	
Intermediate	23(22.0)	33(32.0)	56(27.1)	
Advanced	79(76.0)	59(57.3)	138(66.7)	
Math[a]				4.54
Basic	4(3.8)	8(7.8)	12(5.8)	
Intermediate	31(29.8)	41(39.8)	72(34.8)	
Advanced	69(66.3)	54(52.4)	123(59.4)	
Behavior[a]				21.34***
Basic	0(0.0)	10(9.7)	10(4.8)	
Intermediate	12(11.4)	28(27.2)	40(19.2)	
Advanced	93(88.6)	65(63.1)	158(76.0)	

Note: [a] Number (and % in parentheses) for categorical data. [b] Means (and standard deviations in parentheses) for interval data. * $p < .05$,** $p < .01$.

Bivariate associations between variables are reported in Table 2. Regarding trait EI scores, significant and negative correlations were found with scholastic anxiety (r = -.42; p < .01) and depression (r = -.58; p < .01), while significant and positive associations were found with all SI dimensions (p < .01). Trait EI also showed a significant and positive relationship with language subjects (Italian: r =.17; p <.05 and English r =.26; p <.01), and math (r = .16; p < .05), but not with behavior (r = .11; p > .05) while only Social Information Processing dimension of SI showed a significant and positive relationship with Italian (r = .30; p <.01), English (r=.26; p < .01) and math (r =.22; p <.05), but not with behavior ratings (r= .01; p >.05). Scholastic anxiety showed a significant negative relationship with Italian (r=-.15; p <.05), and math (r=-.14; p <.05), while depression showed significant negative relationship only with behavior ratings (r=-.17; p <.05).

Table 2. *Correlation analysis between variables*

	1	2	3	4	5	6	7	8	9	10
1. SI-SP	.									
2. SI-SS	.24**	1								
3. SI-SA	.05	.40**	1							
4.Trait EI	.36**	.55**	.30**	1						
5. Anx-Schol.	-.14*	-.27**	-.23**	-.42**	1					
6. Depression	-.12	-.30**	-.29**	-.58**	.45**	1				
7. Italian	.30**	.07	.06	.17*	-.15*	-.10	1			
8. English	.26**	.07	.03	.20**	-.13	-.16*	.69**	1		
9. Math	.22**	.06	.08	.16*	-.14*	-.11	.81**	.68**	1	
10. Behavior	.01	.01	.07	.11	-.08	-.17*	.29**	.26**	.33**	1

Note. SI-SP= Social Intelligence- Social Information Processing, SI-SS= Social Intelligence- Social Skills, SI-SA= Social Intelligence- Social Awareness, Trait EI= Trait Emotional Intelligence, Anx-Schol= Scholastic Anxiety. $^{*}p < .05$, $^{**}p < .01$

Table 3 shows the results of the logistic regression analyses testing Hypothesis 1, which examined whether trait EI and the three SI dimensions predicted the likelihood of exhibiting clinical levels of scholastic anxiety and depression. First, a binomial logistic regression was performed to ascertain the effects of sex, trait EI, and SI on the likelihood that children showed clinical levels of scholastic anxiety. The logistic regression model was statistically significant, $\chi^2(4) = 24.35$, $p < .001$, explaining 17.8% (Nagelkerke R^2) of the variance in scholastic anxiety and correctly classifying 74.5% of cases. As regards sex, females were not more likely to exhibit clinical scholastic anxiety than males ($p > .05$). Importantly, higher trait EI scores were associated with a significantly decreased likelihood of exhibiting clinical scholastic anxiety (OR = 0.20, 95% CI [0.08, 0.42], $p < .001$). None of the SI dimensions significantly predicted the likelihood of clinical scholastic anxiety (all $ps \geq .05$).

A second logistic regression model examined the likelihood of showing clinical levels of depression. This model was statistically significant, $\chi^2(4) = 26.47$, $p < .001$, explaining 25.7% (Nagelkerke R^2) of the variance in depressive symptoms and correctly classifying 90.5% of cases. As with scholastic anxiety, sex did not significantly predict clinical depression ($p > .05$). Trait EI emerged again as a significant protective factor, with higher scores associated with a lower probability

of exhibiting clinical depression (OR = 0.08, 95% CI [0.02, 0.30], $p < .001$). None of the SI dimensions significantly contributed to predicting the likelihood of showing clinical depression (all *ps* > .05).

Table 3. *Logistic Regression Analysis predicting clinical levels scholastic anxiety and depression with sex, trait EI and SI as predictors*

	Scholastic Anxiety						Depression					
Variables	β	SE	OR	95%CI	Wald	*p*	β	SE	OR	95%CI	Wald	*p*
Sex	.26	.33	1.29	[.66, 2.52]	.58	.44	.24	.44	1.27	[.49, 3.33]	.24	.62
Age	-.31	.27	.73	[.43, 1.24]	1.34	.25	-.07	.40	.93	[.42, 2.06]	.02	.86
Trait EI	-1.73***	.43	.20	[.08, .42]	15.68	.00	-2.44***	.63	.08	[.02, .30]	14.86	.00
SI-SP	-.01	.03	.99	[.93, 1.05]	.22	.64	.06	.05	1.06	[.97, 1.17]	2.00	.16
SI-SS	.01	.03	1.00	[.95, 1.08]	.11	.74	.02	.05	1.02	[.93, 1.11]	.10	.74
SI-SA	.02	.04	1.02	[.94, 1.10]	.26	.60	-.06	.06	.94	[.84, 1.05]	1.04	.30

Note. Non-clinical were coded 0, and clinical were coded 1. Female participants were coded 0, and males were coded 1. 95%CI= confidence interval for odds ratio(OR). *** $p < .001$.

Table 4 shows multiple hierarchical linear regression results for academic results and behavioral ratings. Sex, trait EI, and the Social Information Processing dimension of SI were significant predictors in both Italian and English, explaining 10% of the variance each, while only trait EI and the Social Information Processing dimension significantly predicted math, and the model explained 6.3% of the variance. With respect to children's behavior ratings, both sex and trait EI were significant predictors in the final model, explaining about 11% of variance.

Table 4. *Multiple Hierarchical Linear Regression Models for Academic Results and Behavior*

	Italian					English					Math					Behavior				
Model	β	R^2	Adj.R^2	Ch.R^2	*p*	β	R^2	Adj.R^2	Ch.R^2	*p*	β	R^2	Adj.R^2	Ch.R^2	*p*	β	R^2	Adj.R^2	Ch.R^2	*p*
Step1:		.04	.03	.04	.02		.06	.05	.06	.00		.03	.03	.03	.02		.10	.09	.10	.00
Sex	-.16*				.02	-.20**				.00	-.11				.10	-.32**				.00
Age	-.09				.17	-.13				.06	-.13				.07	.08				.20
Step2:		.07	.05	.03	.02		.10	.09	.04	.00		.06	.04	.02	.02		.11	.09	.01	.12
Sex	-.15*				.03	-.19**				.00	-.11				.12	-.31**				.00
Age	-.09				.17	-.31				.06	-.13				.06	.09				.20
Trait EI	.16*				.02	.19**				.00	.15*				.03	.10				.12
Step 3:		.13	.10	.06	.00		.13	.11	.03	.05		.09	.06	.03	.09		.12	.09	.01	.57
Sex	-.12				.08	-.17				.01	-.08				.23	-.32**				.00
Age	-.09				.20	-.12				.08	-.13				.07	.09				.21
Trait EI	.08				.33	.15				.06	.10				.25	.17*				.04
SI-SP	.27**				.00	.20**				.00	.18*				.02	-.05				.45
SI-SS	-.06				.42	-.07				.39	-.07				.40	-.09				.26
SI-SA	.06				.38	.00				.92	.09				.25	.02				.80

Note. β standardized coefficient, R^2 , Adjusted R^2, and Change of R^2 are indicated for every step of the model. *p <.05; **p <.01

4. Discussion

The current study aimed to explore how socio-emotional competencies included in the frameworks of TEI and SI could discriminate between clinical and non-clinical levels of both scholastic anxiety and depression, and act as predictors for better academic results and behaviors in the context of primary school.

Overall, no sex differences were found in depression, school anxiety, trait EI, or SI, nor did we observe age-related differences across the 8–11 age range. The literature provides mixed findings on trait EI sex differences during childhood (Agnoli et al., 2019; Hansenne & Le Grand, 2012; Kokkinos & Kipritsi, 2012; Mavroveli & Sanchèz Ruiz, 2011), and such diverse evidence can be explained by cultural aspects related to emotional expression, which may affect children's self-perceptions and the way they respond to self-report measures. However, our null findings for sex and age should be interpreted with caution, given methodological and contextual factors. First, the study may have been underpowered to detect small sex- and age-related effects, especially given the relatively modest sample size and the restricted developmental window considered (late childhood). Second, the age range (8–11 years) is relatively narrow and entirely situated within primary school, which may limit the emergence of developmental differences in internalizing symptoms and socio-emotional competencies. Third, we did not examine measurement invariance by sex or age, and subtle differences in how boys and girls, or younger and older children, interpret the items could have attenuated observed group differences. Finally, the study was conducted in a specific cultural and educational context (Italian primary schools), where classroom norms, teaching practices, and parental expectations may promote similar emotional and behavioral standards for boys and girls and downplay overt gender differentiation in the display and reporting of internalizing symptoms at this age.

With regards to the possible effect of trait EI and SI on internalizing symptoms, concerning our first hypothesis, logistic regression analyses showed that trait EI, but not SI dimensions, significantly reduced the likelihood of belonging to the clinical group for both scholastic anxiety and depression. Children who perceive themselves as more emotionally competent appear more capable of managing school-related stressors and academic demands, which may in turn protect them from developing internalizing symptoms such as anxiety and depression (Russo et al., 2015; Mestre et al., 2019; Piqueras et al., 2019). In contrast, social abilities related to SI did not predict the odds of showing clinical levels of scholastic anxiety or depression once trait EI and covariates were accounted for. One possible explanation is that scholastic anxiety, as assessed in this study, may be more closely

linked to performance-related concerns (e.g., tests, oral examinations, teacher evaluations) than to social aspects of relationships with peers or teachers. Similarly, with regard to depression, emotional factors captured by trait EI may represent the core protective processes, while SI skills may be less central in differentiating children who have already reached the clinical threshold. It is also important to note that all SI dimensions were negatively associated with depressive symptoms at the continuous level, even though they did not discriminate between clinical and non-clinical depression. From a developmental perspective, reduced social abilities may be better conceptualized as one of the correlates or outcomes of depressive states in childhood, rather than as a primary risk factor (Rueger et al., 2016), because children with clinical depression may withdraw from social interactions or show difficulties in peer relationships, and lower SI scores could capture these manifestations.

From an effect-size standpoint, the odds ratios observed for trait EI indicate a substantial protective association: in our models, a one-point increase on the 1–5 trait EI scale was associated with approximately 80% lower odds of being in the clinical range for scholastic anxiety (OR = 0.20) and around 90% lower odds for clinical depression (OR = 0.08). At the same time, the Nagelkerke R^2 values (17.8% for scholastic anxiety and 25.7% for depression) suggest that, although trait EI is a significant correlate of internalizing symptoms, a considerable proportion of variance remains unexplained, suggesting that other individual and contextual factors also contribute to clinical risk.

Finally, regarding the effects of trait EI and SI on academic results, the second hypothesis was also partially confirmed: trait EI significantly predicted better academic results in both language and math subjects and better behavior ratings. Moreover, SI did not globally predict academic results and behavior; only the Social Information Processing dimension emerged as a significant predictor of better academic results. On the whole, the effect of these predictors was modest, consistent with other studies focusing on trait EI and academic performance (Mavroveli, 2009; Li & Shi, 2019). In practical terms, the variance explained by socio-emotional predictors in academic outcomes was small ($R^2 \approx$ .06–.13 across subjects), suggesting that trait EI and Social Information Processing should be viewed as complementary resources that support, but do not replace, cognitive and instructional determinants of scholastic achievement.

A possible explanation for these results is that ratings in Italy are more focused on cognitive aspects, with a traditional setting that promotes passive learning and a very task-oriented teaching approach. In such a context, high levels of trait EI may facilitate the regulation of emotional stress during challenging tasks, thereby supporting better performance without necessarily translating into fewer behavioral problems as perceived by teachers. The specific role of Social Information Processing may reflect the fact that this dimension is not only tied to understanding social situations,

but also to efficiently processing complex information more generally; this capacity may be particularly relevant for the kinds of learning and assessment emphasized in the Italian school system, and thus may promote better academic outcomes.

Taken together, the findings of the present study highlight the importance of considering socio-emotional variables, particularly those encompassed by trait EI, as relevant psychological attributes in health-promotion programs aimed at preventing clinical depression and scholastic anxiety in primary school children, with no evident sex or age differences in this sample. From a school-based perspective, our results suggest that universal interventions focusing on emotional self-awareness, understanding of others' emotions, and adaptive emotion regulation may be especially promising for reducing internalizing risk in late childhood. Screening tools assessing trait EI and internalizing symptoms could be used to identify children who may benefit from targeted support, while still embedding socio-emotional learning activities within the regular classroom curriculum.

In line with this view, recent work in Italian primary schools has shown that brief group-based programs focused on emotional competence can be feasibly integrated into the regular curriculum and improve children's ability to recognize and express emotions (La Grutta et al., 2022). These interventions typically combine structured activities (such as emotion talk around stories, drawings and colors, role-plays, and guided group discussions) with opportunities to reflect on everyday school stressors and to experience different coping strategies in a supportive peer context. Adapting such protocols to explicitly target core components of trait EI (e.g., emotional awareness, regulation, and understanding of one's own and others' emotions) and social intelligence (e.g., Social Information Processing and Social Skills) could represent a concrete way for schools to promote the development of the socio-emotional resources that, according to the present findings, are most closely linked to internalizing symptoms and academic performance.

5. Limitations and future directions

Several limitations should be noted in this study. First, the generalizability of the findings deserves further examination as participants were recruited from only a few Italian schools. To our knowledge, there are currently no similar studies with data coming from clinically depressed primary school-age children, and, to further corroborate these findings, new studies may collect data with children who received a diagnosis for depression and anxiety. Secondly, the cross-sectional design does not allow for the grasping of changes in the variables over time. Third, we used only self-reported measures that could biased our results because of phenomena such as social desirability. Another limitation

could be the lack of demographic information on the sample, including family composition and socioeconomic status, which may moderate the present results. For these reasons, future research is needed with larger and more heterogeneous samples, using different kind of measurements for data collection, including data triangulation, interviews, and graphic techniques.

6. Conclusion

Overall, these results may have practical implications as socio-emotional constructs, such as SI and trait EI, could be used for the identification of emotional as well as school maladjustment. Additionally, trait EI and SI may also be considered relevant to improve scholastic well-being, for instance by means of structured activities promoting the empowerment of these emotional and social competencies, especially in childhood, in which they are in development, implementing these activities also in school-time also with the teachers' participation.

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