Fostering emotional intelligence in preadolescence: Effects of a pilot training on emotions, coping and psychological well-being

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Abstract

The purpose of the present study was to examine the efficacy of a short training programme (eight 1-hour sessions) aimed to promote Emotional Intelligence (EI) abilities in primary school on a set of outcomes related to affect, coping and psychological well-being. Sixty-eight preadolescents (10.68±.58 years) were randomly assigned to either the experimental condition (EI training) or the active control condition (pro-environmental training). ANOVAs and Bayesian analyses were performed on pre/post-training measures of ability and trait EI, positive/negative affect, regulatory emotional self-efficacy, coping styles, and psychological well-being. Results showed that only in the EI training condition emotional abilities significantly improved, whereas negative affect and the preference for distraction coping significantly diminished. Although the effects of the present EI training did not extend to the other measures, the findings suggest its effectiveness in improving preadolescents' EI basic skills and some important adjustment variables. This study confirms the efficacy of short school-based programmes in enhancing EI abilities and highlights the importance of further investigating the training features required to extend its benefits also to psychological well-being. Implications for research and educational practices are discussed.

Introduction

The present study was aimed to examine the efficacy of a brief training programme to promote Emotional Intelligence (EI) skills in primary school on a set of outcomes related to psychological

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adjustment. The crucial role of EI in youngsters' adjustment has been largely demonstrated by previous research (e.g., Di Fabio & Kenny, 2016; Pauletto et al., 2021). In this regard, two main theoretical frameworks have been developed around the construct of EI: according to the ability-based model (AEI; Mayer & Salovey, 1997), EI is a set of cognitive abilities referred to the perception, understanding, usage and management of emotions; according to the trait-based model (TEI; Petrides et al., 2007), it is a constellation of self-perceptions and dispositions related to the personality domain. Recently, these two models and the Emotion Regulation model (Gross, 2015) have been combined in an Integrated Model of Affect-related Individual Differences, which suggests how the different EI-related constructs may interplay with each other (Hughes & Evans, 2018).

In order to promote an optimal adjustment and to prevent the onset of possible mental disorders, the fostering of EI skills should be encouraged from the early stages of development, with particular attention given to peculiar phases, like preadolescence, in which an increased emotional vulnerability enhances the risk of developing emotional problems (Bacter et al., 2021).

School can be considered an ideal setting for the promotion of EI because equal opportunities to acquire and practice skills in realistic inter-individual situations are given to numerous pupils (Masia-Warner et al., 2006). In recent years, school-based EI intervention programmes have shown promising results in promoting adolescents' adjustment (e.g., Ruiz-Aranda et al., 2012) and preschoolers' emotional skills (e.g., Ulutas & Ömeroğlu, 2007). Among the few studies conducted with preadolescents, it was found that 1-year EI intervention was effective in improving emotional competence, and a further year of intervention was also able to affect EI traits (Viguer et al., 2017). This finding suggests that emotional skills related to the explicit knowledge about emotions are easier to modify than emotional traits, as the latter are more relevant to the personality domain and therefore comparatively more stable (Hodzic et al., 2017).

The few studies conducted in the Italian context have shown their effectiveness in enhancing preschoolers' and high-school students' emotional skills (Di Fabio & Kenny, 2011; Di Maggio et al., 2017; Grazzani & Ornaghi, 2011) and in decreasing primary-school children's emotional problems (Crescentini et al., 2016). However, to the best of our knowledge, none of the existing Italian studies in the field have tested the effects of an EI training concurrently taking into account the following aspects: (1) strictly controlled design (i.e., with an active control condition, structurally equivalent to the experimental one, and randomization at the individual, rather than at the classroom, level); (2) training built on a solid conceptual framework (i.e., AEI models); (3) full set of measures to assess both emotional dimensions (i.e., trait and ability EI, positive/negative affect, regulatory emotional self-efficacy) and other aspects of psychological functioning (i.e., coping styles and psychological well-being); (4) ease of implementation (i.e., short and non-intensive training in terms of frequency of the sessions); (5) target on preadolescence.

By applying an AEI training with the aforementioned features, we expected an enhancement in all the emotional measures, except TEI (likely more challenging to improve with short trainings), and also in the usage of adaptive coping strategies and in psychological well-being.

Method

Participants and procedure

A total of 68 preadolescents (38 males; $10.68 \pm .58$ years) were involved. Students were recruited from three classes of one primary school located in northern Italy. Half of the participants in each class were randomly assigned to the EI training (EI-t, $n = 34$), the other half to a control training

aimed to promote pro-environmental attitudes and behaviours (C-t, $n = 34$). The two groups were previously matched 1:1 for variables that could affect the results (age, gender, nationality, presence of learning disability/special needs, IQ and TEI). Success of the matching procedure was verified through t-test comparisons. The research was approved by the Ethical Committee of the University of Trieste. Parents gave a written consent for their children to participate in the study. Pupils were informed that their participation was voluntary, and that they could withdraw from the study at any time.

Measures

Verbal Comprehension test of Primary Mental Abilities Battery (PMA, Thurstone & Thurstone, 1962; Rubini & Rossi, 1982). This measure estimates the ability to deal with verbal concepts: participants are requested to select from a set of words/pictures the one with the same meaning as the target. Raw scores were transformed in intelligence scores and were employed to match the EI-t and C-t groups (means and SD were, respectively, 120.82 ± 5.74 and 118.18 ± 14.5).

Raven's Coloured Progressive Matrices (CPM, Raven et al., 1998; Belacchi et al., 2008). This measure evaluates non-verbal reasoning ability: participants are asked to select the correct missing part to complete visual matrices by choosing from among six options. Raw scores were converted to percentiles based on normative data; a total score was obtained, representing a fluid intelligence measure. Scores were employed to match the EI-t and C-t groups (means and SD were, respectively, 108.48 ± 13.95 and 107 ± 15.35).

Ability Emotional Intelligence Test (AEIT). This performance test, developed by our team to evaluate some EI abilities, involves 16 items requiring participants to respond with open answers. In the first section (AEIT-lex), which includes 11 items assessing lexical knowledge about emotions, preadolescents are asked to define (i) the term "emotion" and (ii) ten selected emotions. In the second section (AEIT-und), which includes 6 items evaluating the ability to understand the complexity of the emotional experience, preadolescents are asked to report which emotions they think they would feel in critical scenarios, created to simultaneously elicit different emotions. For AEIT-lex, the congruity of participants' descriptions with the commonly shared definitions of emotions is evaluated. For AEIT-und, the capability to identify the complexity of emotional experiences, elicited by each scenario, is considered. Item scores, assigned by two independent judges, range from 0 to 1, with higher total scores (item average) corresponding to higher emotional abilities. Reliability was moderate for AEIT ($\alpha = .64$) and AEIT-und ($\alpha = .69$), whereas it was lower, but still acceptable, for AEIT-lex, ($\alpha = .56$), being that AEIT is a performance test.

Trait Emotional Intelligence Questionnaire–Child Form (TEIQue-CF, Mavroveli et al., 2008; Russo et al., 2012). Designed to assess children's trait emotional intelligence, the questionnaire comprises 75 brief statements, rated on a 5-point Likert scale, allocated to 9 facets (Emotion Regulation, Emotion Expression, Emotion Perception, Self-Motivation, Self-Esteem, Adaptability, Peer Relations, Affective Disposition, Low Impulsivity). Higher scores on the global scale, TEI, highlight higher levels of trait emotional intelligence. Reliability of total TEI was high (Cronbach $\alpha = .87$).

Positive and Negative Affect Scale–Children (PANAS-C, Laurent et al., 1999; Ciucci et al., 2017). The questionnaire includes 15 items measuring positive affect (PANAS-p) and 15 items measuring negative affect (PANAS-n). Children rate the degree to which they have recently experienced specific moods/feelings on a 5-point Likert scale. Higher scores represent higher levels of positive or negative affect. Reliability was high for both PANAS-p ($\alpha = .82$) and PANAS-n ($\alpha = .79$).

Regulatory Emotional Self-efficacy (RESE, Caprara et al., 2008). The questionnaire includes 8 items on the perceived capability to regulate negative emotions (RESE-n), and 7 items on the perceived capability to feel and express positive emotions (RESE-p). Items are rated on a 5-point Likert scale. Higher scores indicate higher levels of negative or positive emotional self-efficacy. Reliability was overall acceptable ($\alpha = .75$ and $\alpha = .69$, respectively).

Children's Coping Strategies Checklist-Revision 1 (CCSC-R1, Ayers & Sandler, 1999; Camisasca et al., 2012). The questionnaire, here used in a 28-item short version (Fiorilli et al., 2015), evaluates how children typically cope with hypothetical stressors, by asking to report, on a 4-point Likert scale, the frequency with which five coping strategies are used: Problem-focus (CCSC-pf), Positive cognitive restructuring (CCSC-pr), Support-seeking (CCSC-sup) - usually considered adaptive strategies, Distraction (CCSC-dis), and Avoidance (CCSC-av) - usually considered dysfunctional strategies. Higher scores in a coping dimension indicate a more frequent use of that coping strategy. Low to moderate levels of internal consistency were found (from $\alpha = .55$ for CCSC-pf to $\alpha = .75$ for CCSC-sup).

Comprehensive Inventory of Thriving-Child (CIT-Child, Su et al., 2014; Andolfi et al., 2017). The questionnaire measures children's psychological well-being through 36 items, rated on a 5-point Likert scale, pertaining to five principal dimensions of positive functioning: Relationship, Engagement, Mastery, Optimism, Life Satisfaction. Higher scores indicate higher levels of well-being. Total CIT α was .89.

Training design

Assessments were conducted before and after the training. Each training consisted in 1-hour weekly sessions for eight total weeks, delivered during school-time by the same instructors (three trainee psychologists supervised by two trained board-certified psychologists). The activities in the two trainings were structurally equivalent (i.e., same proportions of role playing, storytelling, watching video, group discussion, creative works, games) and differed only in their content (EI vs environmental topics, see Supplementary Materials).

Given the estimated higher efficacy of trainings grounded on AEI models (see Hodzic et al., 2017), to increase preadolescents' emotion knowledge and awareness, and encourage the application of emotional skills in their everyday life, we relied on the most recent hierarchical three-factor models of AEI (Hughes & Evans, 2018; MacCann et al., 2014). Specifically, training activities were directed to promote emotion perception, understanding, and management, namely the three branches of emotional abilities (highly correlated to each other and loading onto a single higher-order ability EI factor) assumed by these models.

In the first sessions, focused on prompting the ability to perceive emotions and to augment emotional awareness, participants were introduced to the topic, and were motivated to think about/ discuss the meaning of emotions (e.g., different primary and secondary emotions), and about the ways such emotions are expressed (e.g., facial expressions, gestures), with the scope of learning more deeply how emotional experiences can be characterized through feelings, thoughts, bodily changes and behaviours. The following sessions were dedicated to the understanding of the complexity of emotional experiences, often characterized by co-occurrence of ambivalent emotions having different levels of intensity. Activities included reading, storytelling and watching video, in which children were asked to recognize characters' emotional states, to observe the connotation, magnitude, and evolvement of emotions as events occurred, and to identify the possible presence of ambivalent emotions (e.g., happiness, but also enviousness, for a friend who won a game). Participants were also stimulated to report what they would have felt in similar contexts, given that

stories represented events commonly experienced by children (e.g., conflicts with siblings/friends, loss or breakage of a game). Group discussions were encouraged to share experiences and thoughts, and to facilitate processes of awareness and understanding. The last sessions were aimed at enhancing emotion regulation skills, which are the most complex to develop, given that they require the implementation of time and effort. With trainers' guidance, preadolescents were asked to identify their own emotion regulation strategies and to outline potential new approaches to cope with their disturbing affects. Exercises of role playing in emotional artificial scenarios, writing thoughts, and creative works were proposed. For instance, the "jar of emotions" was created with the purpose of collecting written examples of the most used emotion regulation strategies employed and shared by children, whereas the "emotion regulation kit" portrayed every participant's repertoire of resources potentially helpful in dealing with stressors.

Each training session followed a similar format to guarantee procedure consistency: initially, children were grouped, led to the classroom selected for the training, and welcomed; then, topics debated in the previous session were briefly reviewed, and plans for the current session were presented; subsequently, core activities were proposed (usually 2 for each session); finally, children were invited to reflect on what they had done and learned by writing feedback. At the end of the whole training, participants were provided with a booklet of the collected materials.

Data analyses and results

Statistical approach. We analysed data separately for each measure with a mixed model ANOVA including two factors: Training (EI-t vs C-t; between) and Time (T0 vs T1; within). To assess the effectiveness of the AEI training over the control training, we critically focused on the Time x Training interaction. In particular, we performed three planned comparisons: T0 vs T1 within each group to confirm a significant effect exclusively in the EI-t group; T1 between-group difference to confirm a significant enhancement in EI-t over C-t measures. Effect size measures were reported as η^2_p (small = .01, medium = .06, and large effect >.16) and Cohen's d (small = .20, medium = .50, and large effect >.80). Missing data regarding single items in the various questionnaires were replaced by either the middle point of the relative Likert scale (when this was indicated by the questionnaire manuals), or by the sample average for that item. Six children who did not complete the AEIT task in T0 were discarded from the analyses involving this measure. To overcome possible issues related to sample size, we also used a Bayesian approach by computing the alternative/null Bayes Factor (BF10; Jarosz & Wiley, 2014). BF10 was reported to indicate the strength of the evidence for each analysis. Evidence for the alternative hypothesis was set as BF10>3 and evidence for null hypothesis was set as BF10 <.33, with .33 ≤BF10 ≤ 3 considered as inconclusive for any hypothesis. In this regard, we proceeded to analyze the aforementioned planned comparisons in presence of a significant Time x Training interaction or inconclusive support for the null hypothesis (.33 ≤BF10 ≤ 3). Analyses were performed using R Statistical Software (v4.1.2; R Core Team, 2021). All *p*-values reported were based on a two-tailed alternative hypothesis.

Results

Table 1 summarizes groups' mean and standard deviation values for the employed measures, both in normative and present sample (at T0 and T1): crucially, no t-test at T0 was statistically significant. Training-induced significant results, presented in Table 2, will be discussed separately in the next paragraphs, whereas the other measures displaying no statistically significant between-group differences will be reported in the Supplementary Materials.

Table 1. Groups' means and standard deviation (SD) for each measure at T0 and T1.

—	Italian validation sample	T0		T1	
		EI-t	C-t	EI-t	C-t
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
TEI	3.61 (.39)	3.60 (.32)	3.59 (.36)	3.62 (.37)	3.61 (.46)
CIT	48.43[a] (6.24[b])	45.87 (5.30)	47.88 (6.34)	46.56 (6.15)	48.36 (6.20)
CCSC-pf	10.81 (2.69)	13.97 (2.24)	14.32 (2.59)	13.59 (2.75)	13.18 (2.69)
CCSC-pr	11.69 (3.22)	12.24 (3.39)	13.47 (3.30)	12.35 (2.67)	13.15 (3.26)
CCSC-dis	13.47 (4.13)	14.88 (4.28)	15.82 (4.86)	13.47 (3.81)	15.74 (3.16)
CCSC-av	9.27 (2.53)	14.65 (3.16)	15.38 (3.47)	13.35 (3.88)	14.38 (3.85)
CCSC-sup	13.85 (3.98)	14.59 (3.47)	14.29 (4.53)	13.79 (4.37)	12.79 (4.54)
PANAS-p	42.51 (8.25)[c]	57.38 (7.85)	55.50 (7.81)	57.47 (6.52)	56.65 (9.30)
PANAS-n	26.61 (7.94)[c]	31.91 (6.68)	32.09 (7.82)	29.59 (7.20)	31.68 (8.83)
RESE-n	26.05 (5.19)	24.71 (5.02)	26.53 (5.53)	25.79 (3.98)	26.15 (6.11)
RESE-p	29.66 (4.07)	28.94 (3.30)	28.71 (4.21)	29.06 (3.22)	29.59 (4.14)
AEIT	—	.54 (.09)	.50 (.14)	.64 (.12)	.54 (.17)
AEIT-lex	—	.47 (.11)	.44 (.15)	.54 (.14)	.49 (.19)
AEIT-und	—	.67 (.18)	.63 (.22)	.82 (.16)	.63 (.23)

Note: EI-t: Emotional Intelligence training group; C-t: Control training group; TEI: Trait Emotional Intelligence; CIT: Comprehensive Inventory of Thriving; CCSC-pf: Children's Coping Strategies Checklist, Problem-focus; CCSC-pr: Positive cognitive restructuring; CCSC-dis: Distraction; CCSC-av: Avoidance; CCSC-sup: Support-seeking; PANAS-p: Positive and Negative Affect Scale, Positive affect; PANAS-n: Negative affect; RESE-n: Regulatory Emotional Self-efficacy, Regulating negative emotions; RESE-p: Expressing positive emotions; AEIT: Ability Emotional Intelligence Test, Total score; AEIT-lex: Emotional lexicon; AEIT-und: Understanding emotions.
[a]Calculated by summing normative average scores for each subscale.
[b]Inverse formula of Cronbach's alpha was used to calculate the normative variance of the CIT total score using the normative variance of each subscale and the normative Cronbach alpha.
[c]Calculated by averaging scores available as separated values for boys and girls.

AEIT

The ANOVA on preadolescents' AEIT total score revealed that all the effects were statistically significant. Specifically, the interaction showed an increment from T0 to T1 for the EI-t only (Table 2, Figure 1). Planned comparisons highlighted a significant difference between groups at T1, with the highest mean score for the EI-t. Bayesian analyses strongly supported the existence of a significant score increment for the EI-t, as well as the existence of a significant difference between conditions at T1. By contrast, the same analysis yielded inconclusive results for the C-t.

As for AEIT-lex, the ANOVA showed only a statistically significant main effect of Time, with an increment from T0 to T1. Planned comparisons indicated statistical significance for the difference T0-T1 in both conditions, and no significant difference between conditions at T1. Bayesian analyses substantially supported the lack of the Time x Training interaction, in favour of a strongly supported main effect of Time. For the planned comparisons, Bayesian analyses strongly supported the existence of a T0 vs T1 difference exclusively for the EI-t.

As concerns AEIT-und, the ANOVA showed that all the effects were statistically significant, with the interaction mirroring the effect emerged in AEIT total score. Planned comparisons highlighted a statistically significant increment in T0 vs T1 scores only for the EI-t, and a statistically significant

Table 2. Results of the statistical analyses on measures revealing significant effects.

Measures	Factors	Statistics(df)	E.S.	BF$_{10}$	Support
AEIT	Time	F(1,60) = 23.597***	.28	1140.00	H1
	Training	F(1,60) = 4.969*	.08	2.34	—
	Time x training	F(1,60) = 4.931*	.08	1.88	—
	EI-t: T0 vs T1	t(60) = −5.005***	.79	213.08	H1
	C-t: T0 vs T1	t(60) = −1.865	.40	1.59	—
	T1: EI-t vs C-t	t(60) = 2.669*	.68	4.78	H1
AEIT-lex	Time	F(1,60) = 16.313***	.21	155.27	H1
	Training	F(1,60) = 1.404	.02	.68	—
	Time x training	F(1,60) = .231	.00	.26	H0
	EI-t: T0 vs T1	t(60) = −3.196**	.57	11.15	H1
	C-t: T0 vs T1	t(60) = −2.516*	.45	2.87	—
	T1: EI-t vs C-t	t(60) = 1.158	.29	.46	—
AEIT-und	Time	F(1,60) = 10.103**	.14	8.24	H1
	Training	F(1,60) = 7.031**	.10	4.83	H1
	Time x training	F(1,60) = 9.394**	.14	10.89	H1
	EI-t: T0 vs T1	t(60) = −4.415***	.73	90.02	H1
	C-t: T0 vs T1	t(60) = −.080	.02	.19	H0
	T1: EI-t vs C-t	t(60) = 3.768***	.96	70.73	H1
PANAS-p	Time	F(1,66) = .519	.01	.23	H0
	Training	F(1,66) = .617	.01	.42	—
	Time x training	F(1,66) = .382	.01	.28	H0
	EI-t: T0 vs T1	t(66) = −.073	.01	.18	H0
	C-t: T0 vs T1	t(66) = −.946	.17	.29	H0
	T1: EI-t vs C-t	t(66) = .422	.10	.27	H0
PANAS-n	Time	F(1,66) = 2.797	.04	.64	—
	Training	F(1,66) = .459	.01	.40	—
	Time x training	F(1,66) = 1.366	.02	.39	—
	EI-t: T0 vs T1	t(66) = 2.009*	.33	.93	—
	C-t: T0 vs T1	t(66) = .356	.06	.20	H0
	T1: EI-t vs C-t	t(66) = −1.069	.26	.40	—
CCSC-dis	Time	F(1,66) = 2.289	.03	.52	—
	Training	F(1,66) = 3.516	.05	1.22	—
	Time x training	F(1,66) = 1.782	.03	.50	—
	EI-t: T0 vs T1	t(66) = 2.014*	.38	1.65	—
	C-t: T0 vs T1	t(66) = .126	.02	.18	H0
	T1: EI-t vs C-t	t(66) = −2.670**	.65	4.79	H1
CCSC-pf	Time	F(1,66) = 4.286*	.06	1.30	—
	Training	F(1,66) = .003	.00	.25	H0
	Time x training	F(1,66) = 1.072	.02	.42	—
	EI-t: T0 vs T1	t(66) = .732	.15	.26	H0
	C-t: T0 vs T1	t(66) = 2.196*	.33	.99	—
	T1: EI-t vs C-t	t(66) = .624	.15	.29	H0

Note: EI-t: Emotional Intelligence training group; C-t:Control training group; df: degrees of freedom; E.S.: effect size, partial eta squared for the ANOVAs and Cohen's d for the t-tests; BF10: Inclusion Bayes Factor; AEIT: Ability Emotional Intelligence Test, Total score; AEIT-lex: Emotional lexicon; AEIT-und: Understanding emotions; PANAS-p: Positive and Negative Affect Scale, Positive affect; PANAS-n: Negative affect; CCSC-dis: Children's Coping Strategies Checklist, Distraction; CCSC-pf: Problem-focus. ANOVA results relied on R package jmv (v2.0), BF10 on R package BayesFactor (v0.9.12–4.2).
* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$.
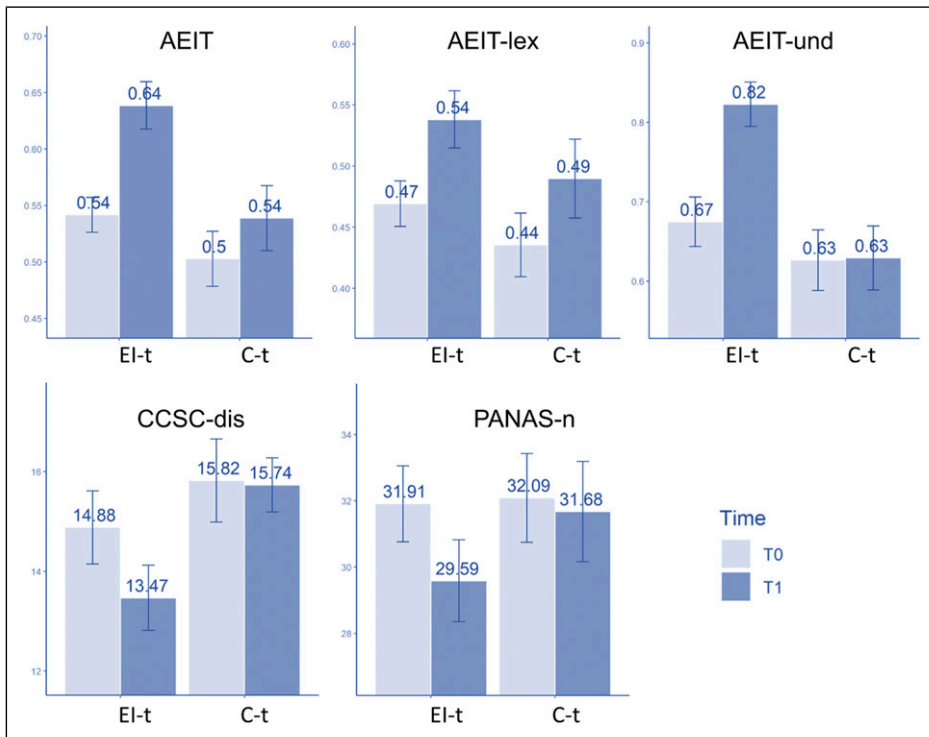
Figure 1. Note: EI-t: Emotional Intelligence training group; C-t: Control training group; AEIT: Ability Emotional Intelligence Test, Total score; AEIT-lex: Emotional lexicon; AEIT-und: Understanding emotions; CCSC-dis: Children's Coping Strategies Checklist, Distraction; PANAS-n: Positive and Negative Affect Scale, Negative affect.

between-group difference at T1. Bayesian analysis strongly supported the existence of the Time x Training interaction, an increment in T0 vs T1 scores in the EI-t, and a score difference between conditions at T1, whereas it substantially supported the lack of differences in the C-t.

PANAS

The ANOVA for PANAS-p showed no statistically significant effects, further confirmed by Bayesian analyses (all BF10 <.29). The ANOVA for PANAS-n showed no statistically significant effects. However, Bayesian analysis provided inconclusive support in favour of the null hypothesis for the Time x Training interaction. Planned comparisons revealed a statistically significant T0 vs T1 difference for the EI-t, and the lack of difference in the C-t, the latter effect substantially supported also by Bayesian analyses. Furthermore, the support to a null difference between groups at T1 was inconclusive (Table 2, Figure 1).

CCSC

The ANOVA for the distraction coping strategy (CCSC-dis) showed no statistically significant effects, and Bayesian analyses provided inconclusive support for the lack of the interaction term.

Planned comparisons revealed a statistically significant T0 vs T1 difference for the EI-t, the lack of differences for the C-t, and a statistically significant difference between conditions at T1. Bayesian analyses confirmed substantial evidence for the lack of T0 vs T1 difference in the C-t, as well as substantial evidence for the difference between groups at T1, thus supporting the reported diminished use of distraction coping in the EI-t, compared with the C-t, at post-training (Table 2, Figure 1).

As regards the problem focus strategy (CCSC-pf), the ANOVA showed only a statistically significant main effect of Time, with a decreasing average score at T1. Bayesian analyses supported the lack of differences between conditions at T1, showing also inconclusive results for a change over time in the C-t. Planned comparisons revealed diminished use of CCSC-pf at post-training for the C-t only (a result that will not be further commented upon since it exclusively pertains to the control condition).

The ANOVAs for the other coping styles did not show significant effects.

Discussion

The present study examined the effectiveness of a pilot EI intervention programme on both preadolescents' emotional outcomes (i.e., EI, positive/negative affect and regulatory emotional self-efficacy), and variables connected to their psychological functioning (i.e., coping styles and psychological well-being). Results showed that our brief EI training, structured according to the AEI models, was associated to participants' improved emotional abilities, decreased negative affect, and reduced preference for distraction coping strategy.

The main outcome revealed that, when compared with controls matched for relevant features, preadolescents who were engaged in the EI training showed higher scores in the AEIT global factor, which represents a set of emotional abilities, including not only the knowledge of various emotions, but also the understanding of complex emotional experiences in specific contexts. Among the EI abilities, understanding emotions seems to be more susceptible to improvements after AEI trainings, and can be considered as the precondition for the development of more complex abilities like emotion regulation (Hodzic et al., 2017). This finding corroborates our hypotheses and previous results, in which positive effects of EI trainings on emotional abilities were detected at different levels of education (e.g., Di Fabio & Kenny, 2011; Ulutas & Ömeroğlu, 2007). Moreover, it enriches the existing knowledge on the topic, confirming the efficacy of school-based programmes in enhancing children's EI abilities, even when trainings are short and non-intensive in terms of frequency of the activities (e.g., once-a-week sessions for 2 months). Conversely, as expected, the training was not effective in enhancing TEI, which may be more challenging to develop with respect to AEI (Hodzic et al., 2017), as a consequence of its pertinence to dimensions characterized by greater stability over time and across situations (Petrides et al., 2007). However, this does not preclude the possibility that TEI could be improved by either longer training or interventions specifically targeted on affective-related personality traits and self-perceptions (e.g., impulsivity, self-esteem, adaptability).

In line with previous findings (e.g., Ruiz-Aranda et al., 2012), we observed a decrease of negative emotions, as measured by the PANAS-n for the experimental group only. It is plausible that, by improving emotional understanding, the training helped the children to be more aware of the emotional processes (e.g., causes/consequences of emotions, transience of emotional experiences), more capable to read their own inners states, and prone to consider emotions as not such harmful or threatening states as previously thought, thus leading to a lower propensity for reporting perturbing emotions.

Similarly, the preference for the distraction coping strategy decreased in the experimental group only. Although, in the short-term, distraction helps in reducing the emotional arousal connected to stressors, it becomes a dysfunctional strategy when used in the long-term, leading to avoidance of the problem (Camisasca et al., 2012). Therefore, the decrement in its preference can be considered a positive outcome specifically linked to the experimental training, rather than to maturational or unspecific training factors (since the effect is absent in the control group). It is reasonable to assume that learning new emotion regulation approaches might have helped children to consider possible other strategies, rather than distraction, to deal with stressors. Although we did not detect any changes in the other assessed coping styles, it should be pointed out that the questionnaire we used to evaluate coping did not include the full set of strategies practiced during the training (e.g., accepting negative emotions, writing feelings in a diary, leveraging own strengths and resources). Therefore, the hypothesis of the reduction in preferring distraction in favour of other strategies is still arguable and needs to be tested with more comprehensive coping questionnaires.

As regards the other variables included in our study, we did not observe the expected enhancement in preadolescents' levels of either regulatory emotional self-efficacy or psychological well-being. On the one hand, these findings may likely reflect the short length of the training, which might have precluded extending the positive effects on emotional skills to other domains. On the other hand, it is worth noting that regulatory emotional self-efficacy and psychological well-being are closely related to emotion regulation, which is the most challenging factor to develop (Mayer & Salovey, 1997), also in the context of longer trainings.

Strengths and limitations

The main strength of the present study was the application of a strictly controlled experimental design, with an active control condition, structurally equivalent to the experimental condition, and randomization at the individual (rather than at the classroom) level. In addition, our training focused on preadolescence, a developmental stage still poorly investigated in association to EI, which requires instead more attention because of the emotional vulnerability that can emerge in this phase. Finally, a large set of measures were employed to assess intervention effects beyond those pertaining to the trained variables.

Among the limitations of the study, as already acknowledged, some assessment tools might have been less than ideal in capturing relevant training-induced effects, thus reducing the positive findings we were able to detect. Moreover, the small sample size may have limited the power of the study and the possibility of generalizing the results, although the Bayesian approach guarantees more reliable data interpretation. Finally, due to time restrictions, follow-up measurements were not collected. These limitations should be taken into account in planning future studies on AEI interventions in order to reach an adequate balance between the training commitments and the extension of their effects on outcomes associated to psychological well-being.

Conclusions

The present work has important implications regarding the improvement of preadolescents' emotional skills through the promotion of tailored trainings in educational contexts. First, EI trainings may help all preadolescents to deal with the emotional challenges typical of this age by enhancing emotional awareness and regulation. Secondly, they may be particularly valuable for students who experience familiar, environmental, or social difficulties (e.g., family conflicts, cyber-bullying, loneliness). Finally, they may have a positive impact on the learning process, enhancing

students' self-efficacy and school motivation, thus preventing the risk of youngsters' potential being lost.

In conclusion, our EI intervention produced some promising results, activating a process of change for preadolescents who engaged in the targeted programme. We detected an increase in AEI levels, a decrease in the self-reported negative affect, and in the preference for distraction coping strategy (usually considered dysfunctional in the long-term). However, we did not find any improvement in TEI and in the variables connected to an optimal psychological adjustment. This suggests that 8 hours may be sufficient to improve basic emotional abilities and some other relevant variables from early stages of development, but too scarce for enhancing all the measured outcomes, and leads to hypothesize that longer interventions would be required to give participants the necessary time to transfer their acquirements into positive practices and habits (Sin & Lyubomirsky, 2009). The findings of the present study contribute to the advancement of knowledge regarding the implementation of school-based EI interventions, they may orient future studies in planning well-structured EI programmes, and, above all, they highlight the importance of promoting the development of EI in educational contexts.

Declaration of conflicting interests

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Supplemental Material

Supplement material for this article is available in online.

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