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Abstract

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Keywords separated by ' - '	Emotions Course - Emotion knowledge - Social competence - Preschool

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Adopting the Emotions Course in the Italian Context: A Pilot Study to Test Effects on Social-Emotional Competence in Preschool Children

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Abstract The purpose of this study was to adopt the Emotions Course (EC) in the Italian context and to examine preliminarily its effectiveness in accelerating the social-emotional competence and reducing maladaptive behaviors in preschool children. The study involved 143 children (73 males and 70 females) aged 3–5 years ($M = 4.4$ years, $SD = .74$), divided into two groups: 1) an experimental group ($N = 69$; 34 males and 35 females), consisting of classes in which teachers realized the EC, integrating it in their usual educational plan; 2) a control group ($N = 74$; 39 males and 35 females), consisting of classes in which teachers exclusively followed their usual educational plan that did not include the EC. Guided by previous studies (Izard et al. in *Early Education and Development 15*:407–422, 2004; Izard et al. in *Development and Psychopathology 20*:369–397 2008a), we hypothesized that, compared to the control condition, in the treatment group the EC would show greater increases in emotion knowledge (Hypothesis 1) and emotion regulation/utilization (Hypothesis 2), and greater increases in social competence along with greater decreases in externalized and internalized behaviors (Hypothesis 3). Results of hierarchical linear modeling analyses confirmed the first two hypotheses and partially supported the third. The results showed that children increased emotion knowledge, emotion regulation/utilization and social competence.

Keywords Emotions Course · Emotion knowledge · Social competence · Preschool

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1 Introduction

For many years, developmental and educational psychologists have focused great attention on the promotion of social-emotional competence. From the point of view of developmental psychology, emotional competence encompasses children's abilities to express themselves appropriately, to interpret and regulate their emotions, and to understand the emotions of others (Denham et al. 2011). Social competence is broadly defined as "effectiveness in interaction," that is, the ability to achieve personal goals in social interactions while simultaneously maintaining positive relationships with others throughout time and across situations (Rose-Krasnor 1997). Several theorists (Campos and Barrett 1984) have highlighted the interdependence of emotional and social competence. They argued that emotional and social transactions are dynamically intertwined throughout the course of a child's development: children's emotional competence supports their growing social competence, which contributes in turn to an increase in their emotional competence in subsequent years.

Over the years, one of the approaches that has contributed the most to explaining the connections between emotional and social competences is the theory of mind. Originally, theory of mind referred to the ability to understand mental states, such as intentions, goals and beliefs (Leslie 1987), but in addition to these metacognitive processes, theory of mind also requires a metaemotional competence, which is an appreciation of the meaning of emotions. This conscious awareness of emotions has been labeled "emotional theory of mind" (Harris 1989). According to the description of these metacompetencies, Fonagy (1991) introduced the concept of "mentalization" defining it as the capacity to conceive of conscious and unconscious mental states in oneself and others. Subsequently, in emphasizing the role of emotions mentalization has also been described as "thinking and feeling about thinking and feeling" (Allen et al. 2008). From a developmental perspective, the ability to mentalize takes its origins from the quality of attachment relationships and becomes a precondition of social skill, self-soothing, empathy, and other facets of emotional intelligence and social-emotional maturity (Hoermann et al. 2013). Through the experience of sensible and responsive caregivers, children learn to reflect upon and to understand their own feelings and motivations as well as those of others, and become able to apply in their social world the model of nurturance that they experienced in the first years of life.

From this and other perspectives, it has been widely demonstrated that, in preschoolers, a greater emotional understanding increases the likelihood that children recognize correctly how others feel and why, and also increases the chance that they will be able to manage their own emotions in accord to those of the others and choose appropriate responses (Izard et al. 2008b). Therefore, the direct influence of emotional processes on social behavior is evident, and the case of empathy is the most typical example of the link between emotional and social competences. Q5

Empathy requires a good emotional knowledge to decode the emotional state of others and share it vicariously; at the same time, empathy plays an important role in the process of social information processing, because an understanding of others' feelings influences a person's response. (Baumgartner 2010, p. 8).

In light of these considerations, as Denham (2010) has affirmed, emotional and social competences are still separable constructs, but they are so closely related that it makes sense to unite them.

From an educational point of view, over the past decade, many social and emotional learning (SEL) programs have been developed in the United States.

SEL programs involve the processes through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions. (CASEL 2012, p. 4).

Some examples of these programs are Al's Pals (Lynch et al. 2004; www.wingspanworks.com), Incredible Years (IY; Webster-Stratton 2012; www.incredibleyears.com); I Can Problem Solve (ICPS; Shure 2000; www.thinkingpreteen.com), and Promoting Alternative Thinking Strategies (PATHS; Bierman et al. 2008; Domitrovich et al. 2005; www.pathstraining.com).

SEL programs are considered a form of continuing education in every year of a child's experience from preschool to high school. Moreover, they are evidence-based; research has shown that their implementation in schools has positive impacts on students' adaptive behaviors and academic performance (Durlak et al. 2011). Studies have documented that effective SEL programs produce one or more of the following outcomes:

1. Improved positive social behavior (e.g., working well with others, positive peer relations, assertiveness, conflict resolution);
2. Reduced conduct problems (e.g., aggressive or disruptive behavior);
3. Reduced emotional distress (e.g., depressive symptoms, anxiety, or social withdrawal);
4. Improved academic performance (e.g., grades, test scores).

In the Italian context, evidence-based interventions for the promotion of social-emotional competence and SEL programs are still meager, especially at the kindergarten level. Some examples include a training study on the use of emotional state talk (Grazzani Gavazzi and Ornaghi 2011) and the "emotion literacy" path for the construction of well-being at school (Renati et al. 2011).

In the first case, the study of Grazzani Gavazzi and Ornaghi was carried out using a conversational approach developed by Hughes et al. (2007): the active use of mental and emotional terms in conversation with others (peers and adults) enhances children's ability to understand internal states such as beliefs, opinions, and desires, and improves children's appreciation of the meaning of emotions, affects, and feelings. On the basis of this perspective, preschool children (randomly assigned to an experimental group) were trained in the active use of emotional-state talk focused particularly on the following target terms: getting scared, getting angry, feeling happy, and desiring. The research outcomes revealed that the experimental group outperformed the control group (with no training) in terms of comprehension of emotion. This confirmed the crucial role of conversations about the emotional lexicon in enhancing children's understanding of emotion-related terms and improving their knowledge of emotions.

As a form of training in emotional-state talk, "emotional literacy" (Renati et al. 2011) refers to a social constructionist perspective of development, in which cognitive aspects (such as understanding emotions or coping strategies) and interpersonal aspects (such as empathy and prosocial behaviors) are strongly interconnected with each other. Emotional literacy intervention, originally designed for primary school children, was

later used with kindergarten children too (Cavioni et al. 2011). At all school levels, the educational program includes activities to strengthen the social and emotional skills that, according to the SEL approach, promote expression, understanding, and regulation of basic emotions and allow children to develop prosocial behaviors and the ability to work together in a cooperative climate, all of which create well-being in the classroom and facilitate learning.

2 The Emotions Course

Among evidence-based interventions designed for the promotion of social-emotional competence in preschool children, the Emotions Course (EC; Izard 2001) is one of the programs that have been tested for effectiveness in the United States (Izard et al. 2008a). The EC is an educational path that aims to accelerate the development of emotion competence. The curriculum fosters three interrelated components in particular: 1) emotion knowledge, which for preschoolers consists of the ability to recognize, label, and express basic emotions such as joy, interest, sadness, anger and fear; 2) emotion regulation, which is the ability to keep the intensity of emotion arousal low enough to prevent behaviors running out of control; and 3) emotion utilization, which is the ability to channel the energy and motivation of emotion in constructive interpersonal negotiation and interactions.

The EC stems from the origins and developments of differential emotions theory (DET), the principles of which were "translated" to form the conceptual and empirical bases of the educational intervention (Izard 1991). These theoretical bases emphasize the inherently adaptive functions of emotions and recognize that poor understanding and regulation of emotions may cause maladjustment and psychopathology in children. These theoretical bases are also the strengths of the EC, because the conceptual framework of the DET can facilitate explanations of treatment effects and the search for causal processes involved in the development of adaptive behavior. Furthermore, compared to other programs, the EC helps children understand that any emotion can have adaptive or maladaptive effects and that the common distinction of basic emotions as positive (joy and interest) or negative (sadness, anger, fear) is not always true. For example, a feeling of enjoyment might have adverse effects when used to make fun of someone else's misfortune; conversely, a feeling of anger might motivate one to be brave, to implement behaviors to defend oneself, and/or to help others. The positive or negative aspects of emotions depend, above all, on the ability to manage them and to utilize the energy motivation inherent in the adaptive functions of the emotion for effective communication, prosocial action, and conflict negotiation. Nonetheless, most of the existing school-based prevention programs give a greater importance to the regulation of "negative" emotions, focusing above all on anger control rather than on activities designed to take advantage of the inherently adaptive functions of all basic emotions, as the EC does. Moreover, many curricula, such as PATHS (Domitrovich et al. 2005) and ICPS (Shure 2000), treat anger management by emphasizing problem-focused techniques that include the following steps: asking the child to stop and think; identifying the problem, feelings, and goals; and generating and evaluating solutions. The emphasis of these programs on self-control and problem-solving abilities is widely shared, but it involves some potential risks.

First of all, the stop-and-think techniques seem to underestimate the importance of releasing physical tension in response to anger: The stop allows children not to act impulsively, but does not allow them to download the excess of energy caused by anger, which, rather, risks leaving the anger suppressed or only frozen (Izard 2002). With regard to this aspect, the Hold Tight technique scheduled by the EC seems, instead, more advantageous than others, because the first two steps (i.e., hold tight something briefly and take three deep breaths) help children reduce arousal and vent anger moderately without showing aggressive behaviors such as shouting, hitting, or damaging something; the next two steps (i.e., the use of words and fair play) help children express anger properly and use the modulated emotion motivation constructively in interactions with other children (Trentacosta and Schultz 2015). Finally, unlike other curricula, the EC emphasizes the potential utility of all emotions, as well as the possibility that frequent activation of emotions such as interest or joy enhances personal well-being and may also prove a superior method for regulating and mitigating the emotions of sadness, anger, and fear.

With regard to the articulation of the EC, the lessons focus mainly on the emotions of joy, sadness, anger, and fear. They also introduce emotions of interest (ones that drive learning and exploration), contempt (in terms of leaving someone out), and shame (the feeling of being left out or being the victim of mean teasing). The EC consists of 20 lessons divided into two to five sections carried out two or three times per week so that the whole educational path is completed in 20 weeks. All the lessons are necessary for the full achievement of the final goal of promoting social-emotional competence and prevent maladjustment. However, the educational path may be divided into two parts, so that the first 10 lessons, in which the emotions of joy, sadness, anger, and fear are introduced, constitute a basic level of learning. This is essential and preparatory to a second, more advanced level, in which children are encouraged to compare and distinguish the different emotion expressions, and the emotions of interest, contempt, and shame are also introduced. Moreover, the program is structured so that for every emotion, the aspects related to the emotion knowledge are taught first, followed by those relating to the ability to regulate one's emotions and use them constructively. So, learning emotion knowledge during the EC may be considered a prerequisite for the development of children's ability to regulate emotions; in turn, both emotion knowledge and emotion regulation – which are crucial aspects of emotional competence – may be considered prerequisites for the development of children's social competence and adjustment.

With regard to the methodology, the activities are carried out by classroom teachers allowing children to learn by doing: children have the opportunity to take part in different kinds of games and playful activities, and thus experience each emotion directly or vicariously in the safe and supportive environment of their classroom. Each lesson begins with the presentation of two puppets that talk to each other and interact with the class; the puppet show illustrates the theme of the lesson and facilitates the acquisition of social-emotional skills. The rest of the lesson includes individual or group games and activities relating to different aspects of knowledge, regulation, and utilization of emotions. Each lesson ends with the interactive reading of an emotion storybook that, like the puppet show, offers children the opportunity to experience emotions vicariously.

So far, in the United States, the EC has been tested for effectiveness in Head Start centers, which offer assistance and provide support services to children and families who are socio-economically disadvantaged. Izard et al. (2008a) conducted two separate

studies in the Head Start centers of the Mid-Atlantic United States. In the first study, the centers were located in small towns or in surrounding rural communities, whereas in the second study, the centers were located in inner-city areas. In both studies, a quasi-experimental design was adopted, randomly assigning each Head Start center to an experimental group or a control group. In the experimental group's classes, teachers carried out the EC as part of the overall curriculum usually followed. For the control group's classes, the teachers in the first study administered their usual curriculum exclusively, while in the second study, teachers adopted a socio-emotional intervention program called I Can Problem Solve (ICPS; Shure 1993). In study 1 (small-town and rural settings), results showed that, compared to the control condition (the usual educational program of the Head Start centers), EC produced a greater increase in emotion knowledge (especially for children aged 4 years and older) and some aspects of emotional regulation (namely, a reduction of mood lability and difficulties in managing negative emotions). EC also produced greater decreases in children's negative emotion expressions, aggression, anxious/depressed behavior, and negative peer and adult interactions. In light of the results obtained in the first study, the EC was partially modified in order to make the activities more suitable and engaging for children of 3 years; in this later version, the EC was evaluated in the second study. The results showed that in study 2 (the inner-city area), the EC led to greater increases in emotion knowledge (for children of all ages), emotion regulation, positive emotion expression, and social competence compared to the established prevention program, ICPS. In addition, this study tested for mediating effects potentially involved in the mechanisms of social-emotional development. The results showed that emotion knowledge mediated the effects of EC on emotion regulation, while emotion competence (an aggregate of emotion knowledge and emotion regulation) mediated the effects of EC on social competence.

3 The Present Study

While the effectiveness of EC in the Head Start centers is documented as described above, until now replication studies have not been done either across settings (such as private child care or public school) nor with target populations outside of the United States; moreover, there are not replications across investigators (i.e., studies in which the adopters of the EC were not previously engaged in the intervention delivery). For these reasons, therefore, replication studies are useful both in US and in other contexts. In particular, after the first author's stay at the Human Emotions Lab of the University of Delaware, where the EC was elaborated and tested for the first time, the decision was made to implement the EC in the Italian school context. So, in agreement with the original developer of the EC, the curriculum was translated into Italian and implemented, a pilot study was conducted to preliminarily test its effectiveness and to decide how to continue with the replication study and identify the next steps. With this aim, we decided to first adopt EC with fidelity to the original educational path and to reserve the possibility to make changes in the program at a more advanced phase, to better adapt it to cultural and setting differences.

The EC was described in an Italian manual that provides all the theoretical and practical guidance to implement the educational intervention in kindergarten (Di

Maggio et al. 2014), while the first adoption of EC in the Italian school context was carried out together with the design and execution of the present study.

In particular, the goal of the study was to determine whether the implementation of the EC would promote the development of social-emotional competence and prevent the maladaptive behaviors in Italian kindergarten children.

On the basis of the original studies on EC (Izard et al. 2004), the application of EC in the Italian context was guided by three hypotheses.

First, we hypothesized that the EC would increase emotion knowledge, that is, the ability to recognize and label the expressions of basic emotions (joy, sadness, anger, and fear) and to understand their external causes.

Second, we expected that the EC would increase emotion regulation and emotion utilization, that is, the ability to control emotional excitement (arousal), to effectively use the motivational component of emotions, and to implement adapted cognitive and behavioral responses to the environment's opportunities and challenges.

Third, we assumed that the EC would increase social competence and decrease the manifestation of externalized and internalized behaviors such as aggression, anxiety, or depression.

4 Method

4.1 Participants and Procedure

The study presented here is part of a larger study involving several schools that is taking place in a large city in southern Italy. We chose to do a preliminary analysis on only a portion of the population involved, so we can consider this a pilot study that could suggest how to proceed with the rest of the population. For this paper, we have selected the schools for which we had the first complete. Participants were 143 children (73 males and 70 females) aged 3–5 years ($M = 4.4$ years, $SD = .74$), attending seven kindergarten classes of two schools located in a middle-class area of the city. Most of the participants were Caucasian (97 %). Almost 90 % of the participants' parents had completed high school (51 %) or had a college degree (35 %). Most of the participants (89 %) came from intact two-parent families, in which both biological parents are present in the home. Children were divided into two groups: 1) an experimental group ($N = 69$; 34 males and 35 females), that in the present study consisted of four classes in which teachers realized the EC, integrating it in their usual educational plan; 2) a control group ($N = 74$; 39 males and 35 females), consisting of three classes in which teachers exclusively followed their usual educational plan that did not include the EC.

The EC trial was conducted during the 2013–2014 school year. At the beginning of the school year, in both schools, we organized a meeting with the headmaster, the teachers, and the parents of the children in all the classes involved in the study. During the meeting, parents were informed about the nature of the emotion-based educational program and the design of the research. We also employed a "passive" consent procedure (known as opt-out) and sent an informational letter to the parents who did not attend the meeting, and thus provided an opportunity for all parents to call our research office if they did not want their child to participate in the study. No parents objected to their child's involvement in the study.

The study consisted of three phases. The first phase, at the beginning of the school year, was dedicated to the initial teacher training on EC and to the pre-intervention assessment. With regard to the training on EC, in the month of September we conducted 4 two-hour meetings with the teachers of the experimental classes. With regard to the assessment of social-emotional competence, in the month of October we collected measures of emotion knowledge, emotional regulation, social competence, and maladaptive behaviors for each child (both in the experimental group and in the control group). We also measured receptive vocabulary to control for verbal ability. The measures were obtained through tests individually administered to children (receptive vocabulary and emotion knowledge), through questionnaires completed by teachers (emotional regulation, social competence and maladaptive behaviors) and through classroom observations conducted by independent observers (social competence). The second phase, lasting 20 weeks (from November to April), was dedicated to the implementation of the EC in the experimental classes, at a rate of two to three lessons per week. During these months, we held periodic meetings with teachers to plan the activities and monitor the fidelity with which the educational intervention was carried out. This monitoring regarded teachers' compliance with the techniques and lesson contents of the EC manual (Di Maggio et al. 2014) and their conceptual framework. The third phase (months of May–June) was devoted to the postintervention assessment in order to measure emotion knowledge, emotional regulation, social competence, and maladaptive behaviors at the end of the school year for all children (both in the experimental group and in the control group), using the same procedure and measures as the first phase (except the test assessing receptive vocabulary, which was only administered before the intervention). Moreover, in the third phase of the study, we carried out preliminary analyses of the data and held meetings with headmasters, teachers, and parents to communicate the results. This research respected the ethical norms of research and was approved by the Italian Psychology Association.

4.2 Measures

Receptive Vocabulary The Italian version (Stella et al. 2000) of the Peabody Picture Vocabulary Test, third edition (PPVT-III; Dunn and Dunn 1997) was administered to control for verbal ability, given that language skills are known to be associated with emotion knowledge. This test evaluates the receptive vocabulary of children between 3 and 12 years. It consists of 150 cards, each containing 4 figures stimulus, and requires the child to indicate the figure corresponding to the word spoken by the examiner. The items relate to words that concern objects of common use and concepts. The words are presented orally and are sorted in ascending order of difficulty. On the basis of correct answers we get a raw score that, through conversion tables organized by chronological age, is transformed into a standard score equivalent for age, which can range from a minimum of 65 to a maximum of 130 (for our data, $\alpha = 94$).

Emotion Knowledge The Italian version (Di Maggio et al. 2013) of the Emotion Matching Task (EMT; Izard et al. 2003) was individually administered to children to assess their emotion knowledge. The EMT is presented as photo album, consisting of four parts (matching expressions, expression-situation matching, expression labeling, and expression-label matching), each of which assesses knowledge of the emotions of

joy, sadness, anger, and fear. Each of the four parts consists of 12 items. In part 1 (matching expressions), children match different expressions in the same emotion category. Children are first presented with a picture of a child who expresses a basic emotion (target expression), and are then shown a set of 4 photographs of children displaying different emotional expressions. They are then asked to indicate which one of the children in the set of four photographs feels the same way as the target one. In part 2 (expression-situation matching), children match expressions with situations or external causes. Children are shown a set of 4 photographs of children displaying different emotional expressions and are described a situation that elicits one of the basic emotions considered. Children are asked to indicate the one that corresponds to the emotion aroused by the description (for example, the one who got a pretty puppy for a birthday present). In part 3 (expression labeling), children have to produce a verbal label for the emotional expression displayed in a single picture. Children are shown the photo of a child who expresses one of the basic emotions considered and are asked to say how the child in the picture feels. Finally, in part 4 (expression-label matching), children match emotional expressions and emotional labels. Children are shown a series of four photographs of children displaying various emotional expressions and asked to indicate which of the four matches a given emotional label (for example, the one who feels happy). For each part, the score can range from 0 to 12, with higher scores indicating a greater ability in the four components of emotion knowledge. For our data, we got a total score of emotional knowledge ($\alpha = .87$) adding the scores of the single parts.

Emotion Regulation The Italian version (Molina et al. 2014) of the Emotion Regulation Checklist (ERC; Shields and Cicchetti 1997) was administered to teachers. The ERC consists of 24 items that allow us to obtain information on two factors: lability/negativity (for our data: $\alpha = .86$; e.g. of items, "It is easy frustrated ") and emotion regulation (for our data: $\alpha = .80$; e.g. of items," It's a cheerful child"). Teachers are asked to rate each child according to a 4-point Likert scale ranging from 1 (*almost never*) to 4 (*almost always*). For the present study, we used only the score of emotion regulation.

Social and Behavioral Competence The Italian version (Ongari et al. 2007) of the shortened version of the Social Competence and Behavior Evaluation (SCBE-30; LaFreniere and Dumas 1996; LaFreniere et al. 2002) was administered to teachers. The SCBE-30 consists of 30 items that evaluate social competence (for our data, $\alpha = .90$; e.g. of items, "Comforts others", "Cooperates"), anxiety-withdrawal (for our data, $\alpha = .88$; e.g. of items, "Rather solitary", "Does not talk during group activities") and anger-aggression (for our data, $\alpha = .84$; e.g. of items, "Irritable", "Easily angry"). Teachers are asked to rate each child according to a 6-point Likert scale ranging from 1 (*never*) to 6 (*always*).

Observation of Social Competence The Italian version (Coppola and Camodeca 2010) of the California Child Q-Set (CCQ; Block and Block 1980; Waters et al. 1985) was used to assess social competence. The instrument has a strong theoretical basis and has been successfully implemented to assess social competence in preschool age (Camodeca et al. 2015; Santos et al. 2013; Vaughn et al. 2014; Vaughn et al. 2009).

The CCQ consists of 100 cards originally describing children behavioral and personality characteristics (e.g. of items, "Is helpful and cooperative", "Is resourceful in initiating activities"). Two observers, who were kept blind to treatment condition, spent a minimum of 20 h during 1 week in each classroom, taking detailed notes of behaviors relevant to the Q-set items. They then described each child sorting the cards according to the degree of similarity between the item and the observed behavior. The sorting procedure of the CCQ is forced, because the categories that describe the degree of similarity are predetermined (nine categories, from 1 = *very different from the observed behavior* to 9 = *very similar to the observed behavior*) and the number of items that can be inserted in each category is defined a priori (according to a "rectangular" distribution which includes 11 items in each category, except in the category 5 -the middle one- which will contain 12 items). To get the score of social competence for each child, we compared the distribution of scores which described the child with a profile criterion. The profile criterion is the average of the sorting made by experts on the social competence and describes the prototype of the social competent Italian preschool child. According to the procedure suggested (Coppola and Camodeca 2010), the comparison of the distribution of each subject (that is, the score received in each item) with that of the criterion (that is, the averages of each item) is carried out by calculating the correlation coefficient r of Pearson. The coefficient, ranging between −1 and +1, expresses the degree of similarity between the distributions, that is, the degree to which each child resembles the prototype of the social competent Italian preschool child. The higher is the coefficient, the more the child is socially competent. Although this criterion is highly similar to the US one reported by Waters et al. (1985), that is $r = .89$, it also is sensitive to cultural specificities and has been shown to be valid and reliable in the assessment of social competence at preschool age (Coppola and Camodeca 2010). Reliability across coders was good, remaining at or above 88 %.

4.3 Data Analysis

We conducted analyses of variance (ANOVA) between treatment and control groups for all the variables at preintervention, in order to know which variables we had to exclude from the subsequent analyses. We also conducted intercorrelations between all the variables at preintervention, to explore the relationships between the variables in the first phase of the study. To assess the treatment effectiveness, we used the Hierarchical Linear Modeling (HLM; Raudenbush and Bryk 2002; Woltman et al. 2012). Specifically, we choose to perform this statistical technique because it can be applied to study with nested data.

> The use of the multilevel linear model seems adequate for the analysis of the data collected in research in the education field, when the aim is to detect the existence of differences between classes (second level units), each of which includes a number of students (first level units), on the basis of the individual measure of a variable Y, detected on each student, taking into account that the characteristics of the students x and those of the classes z may be relevant in determining the observed value of the variable Y. (Ghilardi and Orsini 2002, p. 699)

In other words, individual-level measures from the same upper level group are not independent, but rather are similar due to factors related to group membership, such as the shared history of the class-group. With this typology of data, there are therefore methodological reasons to use HLM instead of regression or other General Linear Model (GLM) (Garson 2013): These latter procedures assume independence of data and, instead, when data are nested, GLM methods may lead to misestimate standards errors, inflating type I errors (false positive); differently, HLM provides correct standard errors for tests of inference that take into account interdependence in the data because of clustering.

Accordingly to these considerations, we choose to perform HLM, after verifying that the variability in the outcome variables, by the level 2 group, was significantly different than zero and that the Intra-Class correlation (ICC) was not so low to not justify statistically these analyses (Woltman et al. 2012). Despite the strengths in the choice of using HLM, we are conscious however that the small sample size of the second level units in our study may affect its statistical power, inflating type II errors (false negative). This implies difficulties in the interpretation of negative results because we would not be able to know whether they are attributable to the ineffectiveness of the educational program or, instead, to the low statistical power of the study (Mathieu et al. 2012). Anyway, in the light of the strengths and limitations, the HLM analysis in our pilot study allow us to verify the presence of positive effects, providing an initial guidance on the effectiveness of the course that must be confirmed, however, through the continuation of the study with a larger sample of classes.

5 Results

5.1 Preliminary Analyses: Descriptive Statistics and Intercorrelations

Table 1 presents means and standard deviations of all variables in the study. The ANOVA examining differences between treatment and control groups at preintervention showed significant differences only for the variable anxious/withdrawn behavior. Because of these pretest differences, subsequent analyses for withdrawn behavior were rendered invalid (Cohen and Cohen 1983). Moreover, the descriptive statistics showed that in the experimental group the mean after the EC was not lower than the mean before the EC and, for this reason, the treatment effectiveness for aggressive behavior was not assessable.

The intercorrelations among all the variables at preintervention (Table 2) showed significant correlations between age and both emotion knowledge and emotion regulation. Emotion knowledge, emotion regulation and social competence were positively intercorrelated to each other. Aggressive behavior was negatively correlated only with social competence; withdrawn behavior was negatively correlated with social competence and emotion regulation.

5.2 Primary Analyses of Treatment Effectiveness

Running the HLM analyses, we first estimated four unconstrained (null) models, one focused on each of the outcome variables except for the two that were excluded

Table 1 Means (and standard deviations) on variables at preintervention and postintervention

	Pre		Post		Possible range	Observed range
	EC (N = 69)	Control (N = 74)	EC (N = 69)	Control (N = 74)		
Variables	M (SD)	M (SD)	M (SD)	M (SD)		
Receptive vocabulary	88.09 (11.69)	90.67 (7.87)	/	/	65–130	76–123
Emotion knowledge	28.42 (10.29)	30.23 (6.57)	37.31 (5.41)	35.32 (8.53)	0–44	0.43
Emotion regulation	3.05 (.53)	3.10 (.40)	3.24 (.54)	3.07 (.31)	1–4	1–4
Social competence	3.92 (.83)	3.87 (.99)	4.11 (.90)	3.70 (1.05)	1–6	1–6
Observed social competence	.69 (.09)	.68 (.09)	.72 (.11)	.64 (.10)	−1.0-1.0	.44–.85
Withdrawn behavior[a]	2.08 (.80)	1.43 (.45)	2.09 (.76)	1.66 (.44)	1–6	1–4
Aggressive behavior	1.59 (.54)	1.45 (.44)	1.78 (.69)	1.84 (.59)	1–6	1–4

EC Emotion Course; Receptive vocabulary: Peabody Picture Vocabulary Test-III score; Emotion knowledge: Emotion Matching Task (EMT) score; Emotion regulation: Emotion Regulation Checklist (ERC) Emotion Regulation Scale score; Social competence: Social Competence and Behavior Evaluation (SCBE) Social Competence Scale score; Observed social competence: California Child Q-Set (CCQ) score; Withdrawn behavior: Social Competence and Behavior Evaluation (SCBE) Anxiety-Withdrawal Scale score; Aggressive behavior: Social Competence and Behavior Evaluation (SCBE) Anger-Aggression Scale score

[a] Significant difference between groups in pretest means

(withdrawn and aggressive behaviors). The outcome variables were: emotion knowledge, emotion regulation, social competence and observed social competence. For each HLM model, we performed two-level analyses with children represented at Level 1 and classrooms at Level 2. Level 1 represented individual differences (within-class variance) and Level 2 represented classrooms differences (between-class variance). We entered treatment at Level 2 as dummy-coded variable (1 = *treatment*; 0 = *control*). As an initial step of the null models, a series of one-way analysis of variance was

Table 2 Intercorrelations between variables at preintervention

Variables	1	2	3	4	5	6	7	8	9	10
1. Gender	/	−.14	.02	.03	−.14	−.11	−.13	−.10	.08	.07
2. Age		/	−.03	−.13	.53**	.26**	.16	.14	−.12	.02
3. Receptive vocabulary			/	−.13	.18	.15	.11	−.07	−.20	−.04
4. EC treatment				/	−.11	−.05	.03	.02	.45**	.14
5. Emotion knowledge					/	.32**	.29**	.22**	−.04	.03
6. Emotion regulation						/	.58**	.36**	−.54**	−.16
7. Social competence							/	.35**	−.28**	−.34**
8. Observed social competence								/	−.05	−.16
9. Withdrawn behavior									/	.20*
10. Aggressive behavior										/

*$p < .05$, **$p < .001$

performed to confirm that the variability in the outcome variables, by Level 2 group, was significantly different than zero. The results of the null models showed that the chi-square tests were statistically significant, supporting therefore the use of HLM. As an additional step, the Intra-Class Correlations (ICC) were calculated to determine which percentage of the variance in the outcome variables was attributable to class membership. The ICCs of each outcome variable were medium-high: ρ (emotion knowledge) = 0,90; ρ (emotion regulation) = 0,35; ρ (social competence) = 0,22; ρ (observed social competence) = 0,31. The next step in running HLM analyses was to test the significance and the direction of the relationship between the predictor variable at Level 2 and the four outcome variables. Before estimating each of the four HLM models, we correlated each outcome variable with its preintervention score and with the potential covariates (age, gender, receptive vocabulary) and treatment (Table 3); potential covariates that had significant correlations ($p > .05$) were included in each model. Specifically, Age was included in the HLM focused on emotion knowledge, emotion regulation and social competence as assessed by teachers; Gender was included in the HLM focused on emotion knowledge.

All predictor variables except treatment and gender of child were grand-mean centered. Table 4 presents estimates for the final HLM models across the four outcome variables. The HLM analyses examining whether EC affected emotion knowledge was significant, t (5) = 4.52, $p < .01$.

The analyses also showed an effect of EC on increase in emotion regulation, t (5) = 3.22, $p < .05$, and social competence, noticed both by teachers, t (5) = 3.02, $p < .05$, and observers, t (4) = 2.64, $p < .05$.

6 Discussion

The purpose of this pilot study was to examine the effectiveness of the EC in accelerating social-emotional competence and reducing maladaptive behaviors in

Table 3 Intercorrelations among outcome measures at preintervention and postintervention, gender, age, receptive vocabulary, and EC treatment

	Variables at postintervention			
Variables at preintervention	Emotion knowledge	Emotion regulation	Social competence	Observed social competence
Gender	−.22*	−.06	−.15	−.08
Age	.38**	.12	.30**	.04
Receptive vocabulary	.08	.15	.06	−.01
EC treatment	.19*	.19*	.20*	.38**
Emotion knowledge	.55**	.11	.35**	19*
Emotion regulation	.20*	.59**	.50**	.11
Social competence	.26**	.40**	.71***	.36**
Observed social competence	.19*	.15	.27**	.31**

*$p < .05$, **$p < .001$, ***$p < .000$

Table 4 Primary hierarchiacal linear modeling analyses

Fixed effect	Coefficient	*t*	*df*	Cohen *d*
Emotion knowledge				
Intercept	35.44	39.80***	5	
EC treatment	3.40	4.52**	5	.28
Gender	−0.70	−0.72	6	
Age	0.06	1.28	6	
Time 1 Emotion knowledge	0.30	5.60***	6	
Emotion regulation				
Intercept	2.90	24.12***	5	
EC treatment	0.44	3.22*	5	.39
Age	0.01	1.68	6	
Time 1 Emotion regulation	0.49	4.17**	6	
Social competence				
Intercept	3.72	38.73***	5	
EC treatment	0.41	3.02*	5	.42
Age	0.03	2.37	6	
Time 1 Social competence	0.64	5.60**	6	
Observed social competence				
Intercept	0.64	34.75***	4	
EC treatment	0.06	2.64*	4	.76
Time 1 Observed social competence	0.33	2.35*	5	

Cohen's d (computed as the ratio of the postintervention mean difference to the pooled SD) is reported only for Emotion Course (EC) effects that are significant

*$p < .05$, **$p < .01$, ***$p < .001$

Italian preschool children. We tested three hypotheses. Compared to a control condition, we hypothesized that, in the treatment group, the EC would create greater increases in emotion knowledge (Hypothesis 1), emotion regulation/utilization (Hypothesis 2), and social competence, along with greater decreases in externalized and internalized behaviors (Hypothesis 3). The results substantiated the first two hypotheses and partially supported the third.

Regarding the first hypothesis, the data, as expected, showed that the EC promotes the development of the most precocious components of emotion understanding: receptive and expressive knowledge and the ability to match emotion expression with situations (i.e. external causes). These results are similar to those of Izard et al. (2008a). We know we must be very cautious when making comparisons with previous studies due to differences in culture, setting, and population (e.g., US Head Start centers vs. Italian kindergartens) and to the nature of this work as a pilot study, but our experience of implementing the EC and gathering the results encouraged us to support the effectiveness of the training in developing emotion knowledge. Already starting from the development of the first affective education programs, it was assumed that teaching children to understand their own emotions and those of others would increase empathic and prosocial behaviors (Feshbach 1979). Many subsequent programs

incorporated aspects of the philosophy and content of the empathy training and affective education approach, such as the Child Development Project (Solomon et al. 2000) or the Second Step (Committee for Children 2011). According to this framework, the EC also underlines that children need practice to understand emotional expressions and their causes; if they become able to recognize emotions in others, they can empathize or feel the need to lend a helping hand. To this end, many elements of Izard's educational path were specifically designed to increase emotion knowledge. For example, to develop receptive and expressive knowledge, the EC manual has numerous colored illustrations of facial expressions that meet the criteria for prototypic emotion signals (Izard 1995). During the lessons, children were stimulated to analyze expression changes in the upper (brows), middle (eyes/nose/cheeks), and lower (mouth) regions of the face, as well as changes in posture and behavior. Children were also encouraged to identify similarities and differences in each expression of basic emotion and to describe and label them. Moreover, some of the dialogues in the puppet play were created to foster children's ability to associate emotional expressions with their causes (external events or internal cues, such as desires) and consequences (possible overt actions). These activities, along with other games and the interactive reading of emotional stories, allowed children to improve their ability to detect signals related to other people's feelings and intentions by labeling the emotions and talking about their own feelings.

Regarding the second hypothesis, we expected that the EC would increase emotion regulation and utilization. The data supported this hypothesis. As for emotion knowledge, the gain in emotion regulation might be attributed to the contents and methodological aspects of the EC and its theoretical background. One of the basic principles, for instance, is that all emotions have one very important function in common: they are all inherently motivational and promote adaptation (Izard 2009). Emotions are very important in motivating children's thoughts and actions. For this reason, no emotion should be considered altogether positive or negative, and emotion utilization might be considered the key to good functioning. Izard et al. clarify this point with two examples:

> The adaptive functions of anger and sadness are self-assertion and social support seeking, respectively. Given adequate emotion knowledge or understanding of emotion, and a supportive social context, a child can learn to utilize the energy and motivation in anger arousal for positive self-assertion rather than for yelling or hitting. Similarly, an adolescent can learn to utilize the energy and motivation in sadness to reach out for social support from peers or family rather than withdrawing from the situation that is causing the sadness. (Izard et al. 2008b, p. 156)

In light of these considerations, the EC enabled children to apply regulation techniques in order to modulate arousal and act constructively on the inherently adaptive motivation of each of the basic emotions they experience (interest, enjoyment, anger, fear, and sadness).

Regarding the third hypothesis, we expected that EC would increase social competence and decrease externalizing and internalizing behaviors. The analyses partially confirmed our hypothesis. The data showed that the EC increased social competence

and that this positive effect was witnessed by both teachers and independent observers. This result is particularly important because the independent observers did not have a stake in the outcome and were not aware of the experimental conditions. The converging evaluations of teachers and observers allow us to confirm that the EC has a positive impact on social competence. On the other hand, the results did not demonstrate that the EC can reduce maladaptive behaviors, for two different reasons. In the case of internalizing problems, significant mean differences at pre-intervention were observed in teachers' ratings across the experimental and the control groups, and therefore we cannot have a valid test of the effect of the EC on this measure. In the case of externalizing problems, contrary to prediction, descriptive statistics showed that the aggressive behaviors were greater at the end of the EC than at the beginning of the educational pathway, despite the fact that several activities, games, and the interactive reading of stories were implemented to decrease such behaviors. For instance, teachers helped children better understand the physiology of intense anger and its possible consequences; they taught children how to respond emphatically to someone who is angry, and, most importantly, they demonstrated techniques that allowed the children to control anger, to use words to express their feelings appropriately, and to utilize anger as a form of motivation (e.g., for appropriate self-assertion). Even when these techniques were taught, the results were contrary to the initial expectations.

7 Limitations and Future Directions

The study represents an important contribution in the field of social-emotional education through evidence-based approaches, the culture of which is still not widespread in Italian schools. Despite this, the study has some limitations, all of which suggest rewarding avenues for further research.

First, in the present study, the size and the location of the sample does not allow a proper interpretation of the data or a generalization of the results to the Italian context. For example, with regard to anxious and withdrawn behaviors, the execution of the replication study and future research with larger samples – especially using more classes – should increase the likelihood of obtaining equivalent measures across experimental and control groups under pre-intervention conditions. This should resolve the difficulty of performing valid analysis of the testing effects of the EC on this measure. Furthermore, involving a greater number of classes would improve the statistical power of the study. However, as mentioned, the research introduced here is intended as a pilot study developed to test the applicability of the EC with Italian children and teachers and to make decisions on how to proceed. In this perspective, the next step will be to adapt, and not simply adopt, the EC to the Italian context, analyzing the cultural sensitivity of the instrument and its ecological validity.

A second limitation concerned the measure of internalizing and externalizing problems that was obtained only from teachers' ratings. It is possible, namely, that teachers' subjectivity influenced their evaluations and that they perceived children at the end of the school year as less well-behaved due to their own fatigue. For this reason, it would have been better – and will be necessary for the next step of the research – to add an independent measure of maladjustment (as we have done for assessing social competence).

A third limitation concerned the assessment of the intervention fidelity. In our study, we evaluated whether the program was delivered as designed through periodic meetings with teachers, during which children's outputs were analyzed and teacher consultations were conducted, ensuring that the activities were carried out as planned, both with respect to the objectives and the contents of the lessons, as well as to the methodology applied. In the next step of the study, however, treatment fidelity will be best assessed with implementation-monitoring tools that allow us to obtain more objective measures of treatment adherence, such as direct observations of the EC lessons carried out by teachers and checklists. In this way, we will have data to understand teachers' fidelity to the EC program as a possible variable moderating treatment effects.

Finally, the study did not involve the parents in the educational path, while Izard's implementation of the EC involved parents in two ways. First, for each of the 20 lessons, a weekly message was sent to all parents in the treatment group. The messages summarized the lessons or highlighted their key features. It was also requested that the parents and their children perform home tasks related to the lessons, which were explained in the message, and that their children have to bring these worksheet back to the Head Start centers. Second, the parents were involved in four meetings throughout the course of the program to discuss the content of the EC and to increase their understanding of what their child was learning about emotions and prosocial behavior. In our initial project, it was not possible to involve parents in the process of social-emotional learning aside from the two information meetings at the beginning and the end of the school year. Future implementations of the EC should not only inform parents about the EC's work, as we have done until now, but should also train parents to become "co-actors" in the development of their children. This will create continuity between school and home education.

Despite these limitations, overall, the study has the advantage of having proposed a socio-emotional training that has a solid theoretical basis and that is part of evidence-based interventions, which are seldom conducted in Italian schools. Our adoption of EC was successful for the development of children's knowledge of emotions, their emotional regulation, and social competence. However, in accordance with the standards of evidence (Flay et al. 2005), other studies are needed before the EC can be applied and considered ready for dissemination in either the United States or Italy.

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