‘Let’s Talk about Emotions!’: The Effect of Conversational Training on Preschoolers’ Emotion Comprehension and Prosocial Orientation

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Abstract

We investigated whether conversational intervention focused on emotions could promote the development of emotion comprehension (EC), theory of mind (ToM), and prosocial orientation in preschoolers. Seventy-five 4- to 5-year-old children (M\text{age at pre-test: 5 years and 1 month; standard deviation } = 6.83 \text{ months}), assigned to experimental and control conditions, were pre- and post-tested for verbal ability, EC, false-belief understanding, and prosocial orientation. Over a 6-week intervention, all children were presented with brief illustrated scenarios based on emotional scripts. The training group was then involved in conversations about the nature, causes, and regulation of emotion whereas the control group engaged in free play, where conversation was minimized. The training group outperformed the control group in EC and prosocial orientation, even after controlling for gains in verbal ability whereas no differences were found for children’s false-belief understanding. The positive effect remained stable over time. Practical implications of the findings are discussed.

Keywords: emotion comprehension; social cognition; prosocial behaviour; preschool

Introduction

This study is situated within the vibrant area of research that focuses on how children develop social understanding: a construct encompassing a range of cognitive abilities such as the comprehension of desires, thoughts, beliefs, and emotions, as well as socio-emotional skills including, for instance, perspective taking, empathy, and positive social orientation (Carpendale & Lewis, 2006).

Emotion comprehension (EC) and theory of mind (ToM), the two main constructs of social cognition, are highly correlated and considered indicators and predictors of a variety of cognitive and socio-emotional abilities (Hughes, 2011) as well as of prosocial action (Ensor, Spencer, & Hughes, 2011). In the present study, we set out to test the efficacy of an intervention based on the conversational approach (Siegal, 1999).
and specifically designed to enhance children’s EC, while exploring whether it also led to gains in their ToM abilities and prosocial orientation.

EC, ToM, and Prosocial Orientation

Within the research domain of social cognition, a consolidated line of inquiry has examined the development of EC, a set of abilities enabling the child to understand the nature and causes of emotions and the fact that emotions may be regulated through specific behavioral and cognitive strategies (Pons, Harris, & de Rosnay, 2004). Despite the fact that children display a certain amount of individual variation in this regard, a substantial corpus of data have allowed the main steps in the development of EC to be identified (Harris, 2008; Pons & Harris, 2005). Specifically, children with a typical developmental profile progress through three main levels of EC, comprising nine different components.

According to the theoretical model based on the standardized Italian data (Albanese & Molina, 2008), at a first level (conventionally referred to as external), children from around 3–4 years of age demonstrate mastery of three easier components: recognition of facial expressions, understanding the impact of situational causes on emotions, and the role of desires in emotions. At a second level (termed mental), children from around 5/6 years of age display correct understanding of three further components: the role of beliefs in emotions, the impact of memory on emotions, and the distinction between outwardly expressed and privately felt emotions. Finally, at a third level (labeled reflective), children from about 8/9 years of age are found to have acquired three more complex components of EC: the effect of morality on emotions, awareness that emotions may be regulated using cognitive control strategies, and an appreciation of concurrent mixed feelings. Each transition from one level to another represents an increase in the child’s ability to understand the effect of internal states on emotional experience.

The second theoretical construct investigated in the current study is ToM, that is to say, the ability to understand the internal states (e.g., intentions, desires, and beliefs of self and others) and to explain manifest behavior in light of such internal experiences. This ability develops gradually throughout childhood, progressing from comprehension of the role of desire in behavior to include understanding of the role of beliefs and false beliefs (Wellman, 1990). Indeed, the ability to solve false-belief tasks has become a key parameter for determining whether children are aware that other people may have perspectives that differ from their own. It is assumed that children have a ToM if they recognize that another person can hold a belief that is different from theirs and to the real state of affairs and that the person will behave in a certain way on the basis of that belief.

Research on the association between EC and ToM in preschoolers has yielded partly conflicting results. In some cases the two constructs are not correlated (Dunn, 1995), whereas in others they are positively correlated (Harwood & Farrar, 2006). In still other cases, although positively correlated, they nonetheless represent two distinct domains, given that variance in ToM has been found not to contribute independently of other variables (e.g., age) to explaining variance in EC, or vice versa (Cutting & Dunn, 1999).

Numerous studies have found that children with more advanced EC and ToM show higher school readiness and academic success (Bierman et al., 2008; Izard et al., 2001; Trentacosta & Izard, 2007) and interact more effectively with peers and teachers (Denham, 2006) than children with lower levels of emotion understanding.
Finally, prosocial orientation may be defined as an individual’s tendency to feel empathy for others and to behave prosocially. Empathy is the basic human ability to respond affectively to emotion in others and a prerequisite for many prosocial behaviors; it is a broad class of actions intentionally undertaken to benefit others. Positive social behavior has been found to increase concurrently with EC and ToM throughout the preschool years and is considered an index of a personal orientation toward acting in a socially positive way (Eisenberg, Fabes, & Spinrad, 2007).

In the next section, we review the principal findings about how EC and ToM relate to prosocial orientation during the preschool years.

Evidence Regarding How EC and ToM Are Related to Prosocial Orientation

A number of studies have reported positive relationships between both EC and ToM and specific aspects of prosocial orientation in preschoolers, such as a strong tendency to engage in cooperative play with peers and to carry out prosocial acts (Cassidy, Werner, Rourke, Zubernis, & Balaraman, 2003).

With regard to EC, which was the central focus of our training intervention, numerous studies have shown it to be related to positive social behaviors: for example, the tendency to engage in actions that benefit others, such as sharing, helping, or comforting (Denham et al., 2003; Eisenberg et al., 2007). From very early childhood, EC has been found to correlate positively with maternal ratings of prosocial behavior (Ensor & Hughes, 2005). Garner, Dunsmore, and Southam-Gerrow (2008) investigated associations between mother–child conversation about emotions and preschoolers’ social competence, finding that both mothers’ and children’s emotion explanations predicted prosocial behavior, but were negatively associated with aggressive actions. Similarly, Ensor et al. (2011) found strong associations between emotion understanding at 3 years and prosocial behavior at 4 years, even after controlling for the effect of verbal ability, which is known to be associated with both. In a longitudinal study with 3- to 5-year-olds, Eggum et al. (2011) found that emotion understanding, more so than ToM, was a predictor of children’s sympathy and prosocial orientation over time, which implies that fostering EC may positively contribute to preschoolers’ prosocial orientation.

Enhancing Children’s Emotional and Social Competence

A growing number of training studies have investigated how to promote gains in socio-emotional competence via school intervention programs. One line of intervention has tested programs designed to enhance socio-emotional abilities, which are conducted by appropriately trained teachers/educators and target children from disadvantaged backgrounds or with emergent mental health problems (Denham & Burton, 1996). For example, Izard, Trentacosta, King, and Mostow (2004) developed the Emotions Course, aimed at improving the emotion knowledge of preschoolers from low-income families (Izard et al., 2004). In a pilot implementation of the course, children showed larger increases in emotion knowledge and less growth in negative emotion expression than their peers in control classrooms. Similarly, Domitrovich, Cortes, and Greenberg (2007) found positive effects of a 9-month teacher-implemented intervention (the ‘Promoting Alternative Thinking Strategies’ curriculum) on preschoolers’ emotion knowledge and social competence. Finally, Wyman et al. (2010) reported positive outcomes on emotional self-regulation in children with behavioral and social classroom issues.
In parallel with this line of inquiry into the prevention of emotional, cognitive, and social problems, there is another research area aimed at identifying mechanisms, such as conversation, for fostering the development of cognitive and socio-emotional skills in typically developing children. In recent years, alongside numerous studies documenting how training can enhance children’s ToM (Lohmann & Tomasello, 2003; Ornaghi, Brockmeier, & Grazzani Gavazzi, 2011), a growing corpus of data has demonstrated the effects of training interventions on children’s EC during both the preschool and primary school years (Bierman et al., 2008; Cefai & Cavioni, 2014; Grazzani & Ornaghi, 2011; Pons, Harris, & Doudin, 2002).

Interestingly, Tenenbaum, Alfieri, Brooks, and Dunne (2008) assigned children between 5 and 8 years to a self-explanation condition and an experimenter-explanation condition. Compared with a control group who only listened to the story scenarios and answered questions unrelated to emotions, children in both experimental conditions displayed gains in EC. The authors argued that an important factor contributing to the improvement in children’s EC was their participation in conversation during the training. Similarly, in a very recent study of our own, we investigated how training primary school children in EC via a conversational approach might affect their later social cognition (Ornaghi, Brockmeier, & Grazzani, 2014). The experimental group showed significant gains in EC, ToM, and the cognitive dimension of empathy; furthermore, the positive effect on EC remained stable 6 months later. On the basis of these encouraging results obtained with 7- to 8-year-old children, we carried out the present study with the aim of testing the same conversational approach with preschoolers. Specifically, we set out to investigate the effect of our training procedure on the cognitive and socio-emotional skills of 4- to 5-year-old children, while also examining the implications for their prosociality given that gains in EC and ToM may lead children to be more prosocially oriented (Eggum et al., 2011).

The Present Study

In the current training study, we adopted the *conversational approach* (Siegal, 1999) used in some of the works reviewed above, because it reflects the social constructionist perspective underpinning our research program on the development of children’s social understanding. This perspective essentially assumes that from their earliest interpersonal experiences, children are involved in conversational interactions that draw them into social life and increase their awareness that people often hold different perspectives on the same situation. In the course of early childhood and beyond, conversational activities such as explaining mental states and discussing them with other people, contribute to children’s developing understanding of the mind (de Rosnay & Hughes, 2006; Ornaghi et al., 2011), helping them to transform their implicit knowledge of it into explicit awareness. Children, in fact, learn to construct and reconstruct their understanding of the meaning of words and expressions by drawing on the way these terms are used in conversation and other everyday pragmatic activities (Tenenbaum et al., 2008; Turnbull, Carpendale, & Racine, 2009).

The current research offers a number of original features vis-à-vis existing training studies. First of all, we examined the effect of our training intervention procedure in a sample of preschoolers, in order to verify whether the positive outcomes obtained with older children could be replicated with younger participants. Secondly, given that the literature emphasizes the link between emotional competence and prosociality, we explored the impact of training not only on children’s EC and ToM, but also on their...
prosocial orientation. Thirdly, we conducted follow-up tests, one of the strong points of the current work given that few of the training studies conducted to date have evaluated whether the benefits of intervention lasted over time.

Thus, the aim of the current study was to examine whether using a conversational procedure to train preschool children in the comprehension of the nature, causes, and regulation of emotions would improve their EC and ToM (after controlling for verbal ability) and have positive effects on their prosocial orientation, in comparison with a control group. We further wished to verify the stability of any training effects identified. As a result of our intervention, we expected that the experimental group would display higher gains in EC, ToM, and prosocial orientation than the control group; in addition, we expected that this effect would last over time.

Method

We conducted a training study comprising four phases: pre-test, training, post-test, and follow-up. The training lasted 6 weeks and approximately 4 months elapsed from pre-to post-test whereas the follow-up took place about 4 months after the end of the post-test phase.

Participants

Seventy-five preschool children (34 girls) displaying typical linguistic and cognitive development took part in the study. They were 4- to 5-year-old pupils \([M_{\text{age}} \text{ at pre-test: } 5 \text{ years and 1 month; standard deviation (SD) } = 6.83 \text{ months}]\) recruited at four kindergartens in a predominantly middle-class rural area of Northern Italy. Participants were quasi-randomly assigned to the two research conditions: training condition \((N = 38)\) and control condition \((N = 37)\). Two groups (from two of the schools) formed the experimental group and two others (from the remaining two schools) the control group. We opted not to assign children from the same preschool to different conditions in order to avoid cross-contamination of the data during the intervention phase. The four schools involved were all under the same management structure with centralized decision-making and academic programming. Participants were recruited at these schools on the basis of the interest and authorization of the school head.

At the pre-test stage, no significant differences emerged between experimental and control groups on any of the measures described in the Instruments section below. Furthermore, preliminary analyses of pre-test scores on all measures as a function of gender showed no significant differences between boys and girls.

Instruments and Coding

Participants completed four measures evaluating verbal ability, false-belief understanding, EC, and prosocial orientation. All the tests were administered individually in counterbalanced order. During the follow-up phase, they were re-tested on EC and prosocial orientation. Participants were tested by three different researchers, all experts in the administration of the selected measures and with similar testing styles in terms of reading expression, tone of voice, and inflection. In order to control for examiner effects, each child was tested by a different researcher at each of the three research phases.

Peabody Picture Vocabulary Test (PPVT). The Italian standardized version of the test (Stella, Pizzoli, & Tressoldi, 2000) was administered to control for verbal ability, given
that language skills are known to be associated with both EC and ToM. This test evaluates the receptive vocabulary of children between 3 and 12 years (Dunn & Dunn, 1981). It consists of 180 cards, each containing four numbered illustrations. The child is required to demonstrate recognition of the word called out by the examiner by pointing to the corresponding illustration or saying its number. Scoring was carried out following the standard procedure, with 1 point assigned for each correct answer and 0 for each wrong answer. The reliability coefficients were $\alpha = .72$ at pre-test, $\alpha = .74$ at post-test, and $\alpha = .74$ at follow-up.

**False-belief Understanding.** To test participants’ false-belief understanding, we used a battery including the false-belief location change task (Baron-Cohen, Leslie, & Frith, 1985) and an Italian adaptation (Grazzani Gavazzi, Ornaghi, & Piralli, 2011) of the false-belief explanation task developed by Peskin and Astington (2004). The latter consists of four illustrated scenarios presented in counterbalanced order to assess participants’ conceptual understanding that a story character may be ignorant of a situation that the participant knows to be true. On the false-belief prediction task, the children were given scores of 1 for the correct answer and 0 for a wrong answer. The scoring procedure for the explanation task was as follows. There were four false-belief explanations required, one for each of the four stories. For each story, children’s explanations were scored as 1, .5, or 0, yielding a maximum score of 4. A score of 1 was awarded for a spontaneous, appropriate explanation using a metacognitive term (e.g., know, think, wonder) or a term implying a mental state (e.g., see, tell, check). If a prompt was required for an appropriate explanation, a score of .5 was awarded. Any other response, or non-response, elicited a 0. The reliability coefficients for the explanation task were $\alpha = .66$ at pre-test, $\alpha = .72$ at post-test, and $\alpha = .70$ at follow-up. Scores for the battery were then summed, yielding a possible maximum total score of 5 (1 for the location change task and 4 for the explanation task).

**The Prosocial Orientation Story-completion Task.** This task was developed for the current study. It consists of four illustrated scenarios (see Appendix), presented in counterbalanced order, describing familiar situations encountered by a child (a boy or a girl, in line with the gender of the individual participant), followed by a question assessing the respondent’s prosocial orientation. The four items focus on specific prosocial behaviors: comforting, peace making, sharing, and helping. The researcher reads the story and after a control question testing of the child’s comprehension of the story (‘What happened here?’), she is asked to say how it ends. Participants’ responses were audiotaped and transcribed. During a pilot phase, the task was administered to some preschool children in order to test their comprehension of the stories and the various types of responses.

Following the coding procedure presented in the Appendix, a score of 0, .5 or 1 was awarded for each item, yielding a maximum possible score of 4. Two judges independently coded participants’ responses, attaining a satisfactory level of inter-rater reliability at all three time points (Krippendorff’s $\alpha = .82$, .84, and .82, respectively). Furthermore, the instrument displayed convergent validity with both the ToM ($r = .45; p < .0001$) and the EC ($r = .39; p = .001$) measures.

**Test of Emotion Comprehension (TEC).** This cognitive test was devised by Pons and Harris (2000) and the current study used the standardized Italian version (Albanese & Molina, 2008). The TEC evaluates children’s developing understanding of the nature,
causes, and regulation of emotion between the ages of 3 and 11 years. It was designed based on the theoretical model proposed by Pons et al. (2004), that we outlined in the Introduction section, which envisages nine components of EC distributed across external, mental, and reflective levels of development.

To administer the TEC, the researcher reads very short illustrated stories to the child and, as provided for by the standard administration protocol, asks control questions in relation to the more complex scenarios to ensure that the child has understood them. After each story, the examiner displays, in systematically rotated order, four illustrations of faces representing different emotional states. The child is asked to choose the face that represents how the protagonist feels by pointing to it or naming it. For instance, in the item testing children’s comprehension of the distinction between outwardly expressed and privately felt emotions, the scenario is presented as follows: ‘This is Mark and this is John. John is teasing Mark because he has lots of marbles while Mark has none at all. Mark is smiling because he does not want to let John see how he really feels inside’. Finally, the examiner asks the child to indicate how the protagonist really feels in this situation by choosing one of the four faces presented.

For each of the nine components, children obtained a score of 0 for a wrong answer and a score of 1 for choice of the correct option. Summing the correct answers, a total score ranging from 0 to 9 was obtained. In addition, we calculated partial scores for the three developmental levels of EC, each ranging from 0 to 3. Data displayed satisfactory reliability at all time points (pre-test: $\alpha = .71$; post-test: $\alpha = .73$; follow-up = .71).

The Intervention Program

Two weeks after the conclusion of the pre-test phase, a 6-week intervention took place. The children participating in the study attended 12 sessions conducted twice weekly with small groups (five/six children per group). The training was held in a different room from their regular classroom, laid out so as to encourage conversation among them and minimize visual and acoustic disturbance. The children were seated in a circle on soft mats. Each session lasted about 1 hr and always began with the reading of a short illustrated scenario or emotional script presenting a prototypical everyday situation with emotional connotations (for example, receiving a desired gift, watching a film, having an argument with someone). Following this, the children in the experimental condition took part in conversation activities guided by a researcher. They were prompted to contribute to these structured conversations by recounting and sharing their own experiences and thoughts in relation to the target emotion. In contrast, after listening to the same story script, the children in the control group played freely, without being engaged in any conversational exchange. Each session was videotaped and the recording viewed afterwards by the research team in order to ensure that the intervention was proceeding as planned. The training activities were conducted by a member of our research team. She was different from the researchers who administered the tests and expert in this type of intervention procedure, which had already been tested in earlier studies (Ornaghi et al., 2014).

The training activities were designed following the theoretical model of EC outlined in the Introduction and focused on four basic emotions: happiness, anger, fear, and sadness. These emotions were chosen because children’s understanding of them is assessed by the TEC and because they are the emotions most commonly experienced in everyday life. Three training sessions were devoted to each of the four target emotions: at a first session, children were trained in understanding the nature of the
target emotion, at a second encounter in understanding its causes, and at a third session in understanding that it is possible to regulate this emotion.

In the experimental condition, children were encouraged to converse with their peers about the nature, causes, and regulation of emotions, drawing on their own personal experience of each specific emotion. The training sessions aimed at developing understanding of the nature of emotions consisted of presentation of the brief scenario followed by stimulus questions on two main aspects: recognition of the target emotions when expressed by self and others and awareness of the possibility that individuals may experience mixed emotions. The training sessions focused on the causes of emotions comprised presentation of the emotional scenario followed by guided discussion of the different kinds of causes (external and internal) giving rise to the target emotions. Finally, training sessions aimed at raising awareness of the regulation of emotions, again began with the presentation of an emotional script, after which children were prompted to reflect on and converse about emotion regulation strategies.

Results

Before proceeding to test the research hypotheses, attrition analyses were conducted given that from an initial sample of 75 children, only 58 (30 in the experimental condition and 28 in the control group) took part in all phases of the study (pre-test, post-test, and follow-up), yielding a 22% attrition rate. Analyses as a function of gender and age were carried out to compare the children who dropped out of the study with those who remained. Furthermore, t-test analyses of the pre-test scores on the administered measures were performed. No differences were found between attrited and not-attrited participants regarding gender ($\chi^2 = .89; p = .34$), age ($t = .56; p = .57$) or pre-test scores on the TEC ($t = .78; p = .44$), false-belief battery ($t = -.20; p = .85$), prosocial orientation task ($t = .51; p = .61$), and PPVT ($t = 1.28, p = .21$).

The results are outlined in three sections: namely, descriptive statistics for all study measures, the effects of the intervention, and the stability of the training effects over time.

Descriptive Statistics

Table 1 shows the means and the SDs for all variables as a function of Group Condition at both pre- and post-test.

At follow-up, the children in the experimental group obtained a mean overall TEC score of 6.82 ($SD = 1.08$) and a mean prosocial orientation score of 3.17 ($SD = .85$). The control group participants obtained a mean overall TEC score of 5.96 ($SD = 1.37$) and a mean prosocial orientation score of 2.36 ($SD = 1.10$).

The Effect of the Intervention on Children’s EC, ToM, and Prosocial Orientation

In line with most of the literature on the development of social cognition, we did not expect gender to have any effect on the intervention outcomes. Nonetheless, given that some studies have reported females to display more prosocial behavior than males (Eisenberg et al., 2007), we included gender in our preliminary statistical analysis.

A repeated measures multivariate analysis of variance was run, with the factors Time (pre vs. post), Group Condition (training vs. control) and Gender (boys vs. girls) as the independent variables. Specifically, Time was a within-subject variable whereas Group...
Condition and Gender were between-subject variables. Scores for verbal ability, false-belief understanding, EC, and prosocial orientation were the dependent variables. Effect sizes were assessed by calculating partial eta-squared ($\eta^2_p$) values.

A significant effect of Time, Wilks’ $\lambda = .22$, $F(4, 56) = 44.94$, $p < .0001$, $\eta^2_p = .78$, and a significant Time $\times$ Group Condition interaction, Wilks’ $\lambda = .71$, $F(4, 56) = 5.02$, $p = .002$, $\eta^2_p = .28$, emerged from this preliminary analysis. Given that gender was not found to have any significant interactive effect at this stage, it was omitted from all subsequent analyses. The univariate tests revealed that the Time $\times$ Group Condition interaction was significant for overall TEC performance, $F(1, 57) = 7.49$, $p = .008$, $\eta^2_p = .12$, the verbal ability measure, $F(1, 57) = 5.17$, $p = .03$, $\eta^2_p = .09$, and the prosocial orientation task, $F(1, 57) = 6.97$, $p = .01$, $\eta^2_p = .11$. No significant effect was found for participants’ false-belief understanding.

The interaction between Group Condition and Time factors was broken down into the simple main effects. For the Group Condition factor, the differences between training and control groups were analyzed at both pre-test and post-test phases; calculation of the main effect did not yield any significant differences between the two groups at the time of the pre-test. As shown in Table 1, at post-test, there were statistically significant differences between the two groups, given that the children in

### Table 1. Pre- and Post-test Means and Standard Deviations for All Variables by Group Condition

<table>
<thead>
<tr>
<th></th>
<th>Pre-test</th>
<th>Post-test</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
<td>Control</td>
</tr>
<tr>
<td>Age in months</td>
<td>62.76 (6.44)</td>
<td>60.64 (7.15)</td>
</tr>
<tr>
<td>Verbal ability</td>
<td>63.76 (22.50) c</td>
<td>65.11 (19.57) d</td>
</tr>
<tr>
<td>EC Total</td>
<td>4.37 (1.34) c</td>
<td>4.58 (1.22) c</td>
</tr>
<tr>
<td>EC external level</td>
<td>2.55 (.76)</td>
<td>2.55 (.65)</td>
</tr>
<tr>
<td>EC mental level</td>
<td>1.24 (.85) c</td>
<td>1.33 (.83) c</td>
</tr>
<tr>
<td>EC reflective level</td>
<td>.59 (.55)</td>
<td>.72 (.61)</td>
</tr>
<tr>
<td>False-belief understanding</td>
<td>2.05 (1.43) c</td>
<td>1.77 (1.29) c</td>
</tr>
<tr>
<td>Prosocial orientation</td>
<td>1.56 (.99) c</td>
<td>1.11 (1.08) c</td>
</tr>
</tbody>
</table>

Note: Standard deviations appear in parentheses below the means. The average values marked with the superscripts a through d were found to be statistically significant on application of a post hoc Bonferroni correction for all measures. EC = emotion comprehension. af Denote the comparisons between experimental and control groups for each of the pre-test and post-test measures. c,d Indicate comparisons between pre-test and post-test scores for the training and the control group, respectively.
the training group outperformed the control group on the TEC, $F(1, 57) = 7.46; p = .008; \eta^2_p = .11$, and the prosocial orientation task, $F(1, 57) = 16.48; p < .001; \eta^2_p = .23$. With regard to the simple main effects for the Time factor, the differences between pre- and post-test scores were analyzed for each of the two groups. Significant differences between pre- and post-test scores were found for the training group on all measures, Wilks’ $\lambda = .15; F(4, 29) = 38.53; p < .001; \eta^2_p = .97$, and for the control group, Wilks’ $\lambda = .39; F(4, 27) = 11.70; p < .001; \eta^2_p = .67$, on the TEC, false-belief battery, and prosocial orientation task (see Table 1).

Given that the interaction between Time and Group Condition was significant for the language measure, we carried out a further analysis in order to test whether the changes in verbal ability explained the differences between groups in pre- to post-test improvements on the TEC and prosocial orientation task. We conducted a repeated measures analysis of covariance with Group Condition as independent variable, EC, and prosocial orientation as the dependent variables at the two time points, and children’s pre- to post-test gains in the PPVT as covariate. The results showed that changes in verbal ability did not account for the differences observed between the two groups in terms of progress from pre- to post-test, which remained significant, Wilks’ $\lambda = .79, F(2, 56) = 6.81, p = .002, \eta^2_p = .20$. In sum, at post-test, the experimental group displayed greater improvement than the control group in both EC, $F(1, 57) = 8.25, p = .006, \eta^2_p = .13$, and prosocial orientation, $F(1, 57) = 5.36, p = .02, \eta^2_p = .09$, even after controlling for gains in verbal ability.

Given that the intervention had been found to positively impact overall EC, separate analyses were carried out to investigate its effects on each of the three developmental levels individually. With regard to the external level of EC, no significant effect was found for the variable Time, nor did a significant interaction take place between Time and Group Condition. Concerning the mental level of EC, we found a significant effect of Time, Wilks’ $\lambda = .59, F(1, 56) = 40.27, p < .001, \eta^2_p = .41$, and a significant Time × Group Condition interaction, Wilks’ $\lambda = .93, F(1, 56) = 4.20, p < .04, \eta^2_p = .07$. Simple main effects were calculated. For the Group Condition factor, significant differences emerged at post-test only, $F(1, 57) = 6.81, p = .01, \eta^2_p = .10$. The experimental group outperformed the control group after the intervention (see Table 1). For the Time factor, significant differences between pre- and post-test scores were found in both the experimental, $F(1, 30) = 33.26, p < .001, \eta^2_p = .50$, and control groups, $F(1, 28) = 11.04, p = .003, \eta^2_p = .29$. Finally, in relation to the reflective level of EC, we found a significant effect of Time, Wilks’ $\lambda = .58, F(1, 56) = 42.76, p < .001, \eta^2_p = .42$, and a tendency toward statistical significance with regard to Time × Group Condition interaction, Wilks’ $\lambda = .94, F(1, 56) = 3.52, p = .06, \eta^2_p = .05$. Simple main effect analyses showed no differences between the two groups at either pre- or post-test. For the Time factor, significant differences between pre- and post-test scores were found in both the experimental, $F(1, 29) = 29.42, p < .001, \eta^2_p = .47$, and control groups, $F(1, 27) = 17.87, p < .001, \eta^2_p = .40$.

**The Stability of the Training Effect on EC and Prosocial Orientation**

Based on the above findings, all participants were re-tested on the EC and prosocial orientation measures at the follow-up stage, in order to verify the stability of the positive training effect 4 months later.

Table 2 shows the mean gains in EC and prosocial orientation obtained by each of the two groups at post-test and follow-up. Figures 1 and 2 present the groups’
performances on the TEC and prosocial orientation task at all three time points. The t-test analyses showed that the improvement in EC and prosocial orientation from pre- to post-test was significantly higher in the experimental group than the control group (see Table 2). Significant differences between the groups concerning gains from post-test to follow-up did not emerge for either the TEC or the prosocial orientation task.

In order to test the trend in the training effect on EC and prosocial orientation from pre-test through follow-up, we carried out a further repeated measures analysis of variance on the total scores for EC and prosocial orientation, with Time (pre-test, post-test, and follow-up) as the within-subject factor and Group (experimental and control) as the between-subject factor. We found a significant main effect of Time, Wilks’ $\lambda = .37, F(2, 56) = 31.31, p < .0001, \eta^2 = .39$, and a significant Time by Group interaction, Wilks’ $\lambda = .90, F(2, 56) = 2.5, p = .04, \eta^2 = .06$. Univariate tests showed that this interaction was significant for both EC, $F(1, 57) = 3.38, p = .03, \eta^2 = .07$, and prosocial tasks, $F(1,57) = 2.82, p = .05, \eta^2 = .06$. In order to break down this interaction, we calculated pairwise contrasts applying the Bonferroni correction for multiple comparisons. These revealed significant differences between the groups at both post-test and follow-up regarding both EC and prosocial orientation. Specifically,

Table 2. Gains in EC and Prosocial Orientation from Pre-test to Post-test and from Post-test to Follow-up for Both Group Conditions

<table>
<thead>
<tr>
<th></th>
<th>Experimental</th>
<th>Control</th>
<th>t</th>
<th>Cohen’s $d$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta_{\text{post-test–pre-test}}$ (EC)</td>
<td>1.88 (1.55)</td>
<td>1.00 (1.10)</td>
<td>2.56*</td>
<td>.71</td>
</tr>
<tr>
<td>$\Delta_{\text{follow-up–post-test}}$ (EC)</td>
<td>.44 (1.02)</td>
<td>.42 (1.27)</td>
<td>.06</td>
<td>.70</td>
</tr>
<tr>
<td>$\Delta_{\text{post-test–pre-test}}$ (prosocial orientation)</td>
<td>1.61 (1.07)</td>
<td>.66 (1.22)</td>
<td>3.14**</td>
<td>1.06</td>
</tr>
<tr>
<td>$\Delta_{\text{follow-up–post-test}}$ (prosocial orientation)</td>
<td>.27 (1.26)</td>
<td>.56 (1.55)</td>
<td>−.75</td>
<td>.82</td>
</tr>
</tbody>
</table>

*Note: Standard deviations are provided in parentheses. EC = emotion comprehension. * $p < .01$, ** $p < .001$.

Figure 1. Training and Control Groups’ Scores on the Test of Emotion Comprehension at Pre-test, Post-test, and Follow-up.
the children in the experimental group performed significantly better than the control group in EC at post-test, $F(1, 57) = 7.46, p = .008$, and follow-up, $F(1, 57) = 7.39, p = .009$). Similarly, they obtained higher scores for prosocial orientation than children in the control condition at both stages [post-test: $F(1, 57) = 16.48, p < .001$; follow-up: $F(1, 57) = 10.85; p = .002$].

**Discussion**

In line with the purpose and hypotheses of our intervention study, we obtained the following main findings: the conversational program had a positive effect on children’s EC, but not on their false-belief understanding; the intervention improved participants’ prosocial orientation; the positive effect of the intervention on EC and prosocial orientation remained stable over time. We now discuss these findings in turn.

The children who took part in the conversational training activity displayed significantly greater gains in EC than their peers in the control group. This result confirms that the training methodology implemented successfully enhanced the EC abilities of the preschool participants, in line with positive outcomes previously obtained with primary school children (Ornaghi et al., 2014; Tenenbaum et al., 2008). Specifically, the intervention model proposed here, based on the use of conversation as a means of reinforcing and co-constructing knowledge (Siegal, 1999), was found to be effective in developing children’s understanding of the nature of emotions, the different causes that can give rise to them, and the strategies that may be used to regulate them. More specifically, trained children showed significant gains in their mental level of EC, which includes the ability to understand the role of beliefs in emotions, the impact of memory on emotions, and the distinction between outwardly expressed and privately felt emotions (Pons et al., 2004). No improvement was found in the external level of emotion understanding since a ceiling effect was already present at pre-test.

Not surprisingly, given the conversational nature of the training activity, the intervention also had positive effects on participants’ general verbal ability. The role of language in fostering the development of social understanding is well documented (Milligan, Astington, & Dack, 2007). It could therefore be hypothesized that the gains in EC displayed by the experimental group at post-test were partly due to gains in

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**Figure 2.** Training and Control Groups’ Scores on the Prosocial Orientation Story-completion Task at Pre-test, Post-test, and Follow-up.

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overall verbal ability. However, our analyses show that EC abilities were enhanced independently of the improvement in language skills. This ties in with the idea that conversational training primarily fosters the transformation of knowledge from implicit to explicit (Grazzani & Ornaghi, 2012; Ornaghi & Grazzani, 2013), allowing children to engage in processes of metacognitive reflection on their own and others’ internal states. In this sense, our results bear out the findings of a substantial body of research demonstrating the importance of the conversational activity in cognitive development (de Rosnay & Hughes, 2006).

With regard to the effect of the training intervention on ToM as assessed by a false-belief battery, although the experimental group children displayed greater gains at post-test than the control group participants, this difference was not statistically significant. This may be due to the fact that the intervention did not specifically focus on false belief, an issue that was not explicitly addressed during the training sessions. Furthermore, as outlined in the Introduction section, the literature reports conflicting evidence with regard to the link between EC and ToM in preschool years. In general, it seems that they may be two interrelated but independent domains (Cutting & Dunn, 1999) insofar as variance in ToM does not appear to contribute independently of other variables to explaining variance in EC, or vice versa. The current study therefore provides further evidence that it cannot be taken for granted that working to strengthen preschool children’s EC will necessarily lead to gains in their false-belief comprehension.

As for our second research aim, the intervention was found to have a significant effect on children’s prosocial orientation. The conversational activity targeting understanding of the nature, causes, and regulation of emotion appeared to strengthen the experimental group participants’ awareness of the feelings of others, thereby increasing their propensity to engage in prosocial behaviors, such as helping, comforting, peace making, and sharing. This finding confirms the strong association, well documented in the literature, between the development of EC and socio-emotional abilities such as empathy (Ornaghi et al., 2014) and prosocial behavior (Ensor et al., 2011; Garner et al., 2008).

The children who took part in the conversational training gave more prosocially oriented answers at post-test, expressing more explicit attention to the feelings of others and a greater tendency to engage in helping, peace-making and comforting actions. For example, in relation to the stimulus scenario ‘Lucy is in the school yard with her classmates. Lucy sees Martina snatch the ball from Julia. Julia starts to cry. How do you think the story will end?’, although at pre-test, the answers of the children in both groups typically either focused on the object being disputed or predicted with a negative outcome (e.g., ‘Martina will play with the ball’, ‘She won’t give it back for weeks’, ‘Julia will go on crying’, ‘Then they will fight’), at post-test, the children in the experimental group gave answers that reflected greater prosociality (e.g., ‘Lucy will help Julia by telling Martina to give it back to her’, ‘Lucy tells them to make up and take turns’, ‘Lucy feels sorry for Julia and tries to get the ball back for her’).

Concerning the stability of the training effect over time, few of the prior studies in this area have offered follow-up data. The inclusion of a follow-up phase in the research design provides empirical evidence for the lasting effect of the intervention program over time. Specifically, the training effect on EC and prosocial orientation had remained stable after 4 months. It is therefore reasonable to conclude that the changes brought about by the training had been fully assimilated and internalized by the children. Thanks to their increased awareness of emotions and the willingness to
discuss them with their peers, they had presumably transferred these abilities to everyday life situations, thereby consolidating the gain over time.

Limitations, Educational Implications, and Future Research Directions

The study displays at least two limitations. Firstly, some of the participants did not complete the later phases of the research; therefore, the post-test and follow-up samples are smaller than the initial sample. Secondly, children’s prosocial orientation was explored using a single, semi-projective measure. It would be of great interest in the future to supplement this instrument with both an ecological measure of children’s actual prosocial behavior in the school context (for example, through observation), and significant adults’ (parents and teachers) ratings of children’s positive social behavior.

Despite these limitations, we believe that the outcomes of this study have interesting socio-educational implications. Teachers, as well as parents, can improve children’s emotional competence by engaging them in conversation about the nature, causes, and regulation of emotions; in this way, they can foster the development of perspective-taking abilities, mindreading, empathy, and prosociality as well as the production of positive social behaviors (Denham, 2007).

Given that improving children’s EC can act as a protection factor against antisocial behavior (Woods, Wolke, Nowicki, & Hall, 2009), some interesting directions for future research would be to test the training effect with problematic children, to explore whether such a conversation-based program might increase specific positive social behaviors, and whether the intervention model tested to date with preschoolers and school-age children may also be successfully implemented with toddlers. To this regard, from a prevention perspective, it would be of great value for socioeducational contexts (e.g., infant–toddler centers and kindergartens) to actively work on very young children’s emotional development in order to promote positive social behaviors. Preliminary results obtained by our own research group suggest that conversational intervention may be a useful and effective means of enhancing both EC and a broader level of social understanding in 2- to 3-year-old children as well (Agliati, Grazzani, & Ornaghi, 2013).

Finally, the current study was conducted with Italian children and we believe that additional important future line of inquiry might be to conduct similar training with samples from a variety of cultures, with a view to reinforcing cross-cultural comparison in a field that to date has mainly be informed by the English-speaking literature.

Acknowledgments

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References


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Emotion Comprehension and Prosocial Orientation


Appendix: The Prosocial Orientation Story-completion Task (Female Version) and Its Coding Procedure

Hello, I’m going to read you some very short stories. Would you like to help me find an ending for them? The stories are about this little girl whose name is Lucy (the researcher shows the child a picture of Lucy). Lucy is a little girl of about 4/5 years old, like you.

Lucy is going to school with Francie. Francie is crying because she tripped on a stone and fell down and hurt herself. How do you think the story will end?

Lucy is at the playground with Anna and Sophie. There is only one swing and both Anna and Sophie want to go on it. Lucy sees them begin to quarrel. How do you think the story will end?

Lucy is in the schoolyard with her classmates. Lucy sees Martina snatch the ball from Julia. Julia starts to cry. How do you think the story will end?

Lucy sees that Andy does not know how to draw a car. Lucy is very good at drawing because her dad taught her. How do you think the story will end?
### Coding procedure

<table>
<thead>
<tr>
<th>Score</th>
<th>Type of response</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>— the protagonist of the story did not recognize the emotional state of the other character</td>
<td>‘She plays with the ball’.</td>
</tr>
<tr>
<td></td>
<td>— did not display prosocial actions toward him or her</td>
<td>‘He doesn’t want to give it back for a while’.</td>
</tr>
<tr>
<td></td>
<td>— displayed anti-social behavior</td>
<td>‘Luke will start to fight too because he wants to go on (the swing) as well’.</td>
</tr>
<tr>
<td>0.5</td>
<td>— the protagonist of the story recognized and was empathic toward the emotional state of the other character, but did not engage in prosocial behavior</td>
<td>‘Lucy sees that she is crying’.</td>
</tr>
<tr>
<td></td>
<td>— the respondent described the protagonist as taking action, but without explicitly stating that the action was intended to be helpful</td>
<td>‘Luke takes the ball’.</td>
</tr>
<tr>
<td></td>
<td>— action was taken by an adult such as a mother or teacher</td>
<td>‘The teacher will put on a plaster’.</td>
</tr>
<tr>
<td>1</td>
<td>— responses describing prosocial action by the protagonist</td>
<td>‘Lucy goes over and gives her a hug’.</td>
</tr>
</tbody>
</table>