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Learning others' point of view: perspective taking and prosocial behaviour in preschoolers Ada Cigala, Arianna Mori* and Francesca Fangareggi

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Early Child Development and Care

Abstract

Perspective taking, defined as the ability to assume another's perspective, can be considered a multidimensional construct which is composed of three different components: cognitive, visual and affective. This study wanted to verify the possibility of promoting perspective taking in preschoolers using ecological training. The maintenance of children's acquired abilities after six months was also assessed. Subsequently, analyses were conducted to examine if a possible increase in these competences could positively influence prosocial disposition and determine a decrease of aggressiveness. The design was a pre-test/post-test quasi-experimental procedure with independent samples: an experimental and a control group, each one with 30 children aged 3–5. Results showed a significant improvement in most of the investigated areas after the training, confirming the possibility of promoting perspective taking abilities. Moreover, children with greater perspective taking skills were also more inclined to behave in a prosocial way during peer interactions. Furthermore, these changes were persistent at the follow-up session six months later. Keywords: perspective taking; prosocial behaviour; training; emotional competence; preschoolers

Introduction

Perspective taking comprises the ability to assume another's perspective, which allows one to infer the thoughts, emotionsand perceptions of others that drive their behaviours in order to get a sense of the surrounding world (Carpendale & Lewis, 2006; Moll & Meltzoff, 2011; Sullivan, Bennett, Carpenter, & Lewis, 2008). Starting from some authors' suggestions (Abrahams 1979; Bonino, Lo Coco, & Tani, 1998; Fireman & Kose, 2010) and from the diverse and varied literature that has attempted to define this construct, it is possible to consider perspective taking as a multi-componential construct characterised by three components: cognitive, visual and affective. Cognitive perspective taking is the ability to infer other people's thoughts, motivations and intentions (Baron-Cohen, 2001; Eisenberg, Zhou, & Koller, 2001). Visual perspective taking refers to the ability to infer how an object is seen from a different position in a space (Moll & Meltzoff, 2011; Moll & Tomasello, 2006; Vogeley & Fink, 2003) and affective perspective taking consists of the ability to understand the emotional states of another person, which provides the foundation for empathy (Bonino et al., 1998; Fireman & Kose, 2010; Harwood & Farrar, 2006; Hinnant & O'Brien, 2007). A review of the literature shows a clear lack of agreement in the use of the term that labels and defines this construct and to the special attention given to one component at theexpenseoftheothers.However,itispossibletoobservehowthisconstructhasbeen investigated in a cognitive approach, in which it overlaps with the concept of Theory of Mind; focusing the attention exclusively on the cognitive aspects. For this reason, the aforementioned constructs use the same

measuring instruments consisting generally of false belief tasks (Baron-Cohen, Leslie, & Frith, 1985; Gopnik & Astlington, 1988; Wimmer & Perner, 1983). In the last 20 years, the interest in developmental psychology has progressively oriented towards considering the relationships between this socio-cognitive skill and other competences of the individual, including emotional and social ones (Carlo, Knight, McGinley, Goodvin, & Roesch, 2010; Downs & Smith, 2004; Hinnant & O'Brien, 2007; Klin, Schultz, & Cohen, 2000; Liverta Sempio & Marchetti, 2001). Perspective taking is very important in social interactions because it facilitates the anticipation of other people's thoughts (Dixon & Moore, 1990). Recent research has demonstrated the existence of a relationship between perspective taking and some aspectsofsocialbehaviour.Forexample,somestudiesinthescholasticcontextemphasised that 'good perspective-takers' also possess more developed social competences. In particular, these children seem very capable with respect to the main social indicators (Downs & Smith, 2004); during symbolic play with peers, they are competent with respect to the pursuit of common purposes, in the assignment of roles to themselves and to others, in the maintenance of the topic and in mutual facilitation (Astington & Jenkins, 1995; Tan-Niam, Wood, & O'Malley, 1998). These same children are considered more socially competent by their teachers (Lalonde & Chandler, 1995) and are more accepted by friends (Fitzgerald & White, 2003; Klin et al., 2000). In addition, other research (Endres & Michelle, 2003) has examined the relationship between cognitive perspective taking and social behaviour in preschoolers. The results showed that the development of general perspective taking is significantly related to social competences. Bolnick (2009) analysed the contribution of early comprehension of thoughts and emotions in children's adaptation to kindergarten. The researcher demonstrated the existence of an indirect relationship between the early ability of cognitive perspective taking and school adaptation (more positive sentiments about school, increasing classroom participation), through the mediation of social competence. The ability to assume the point of view of other people seems to be also highly connected to a specific area of social competence: prosocial behaviour. Roche Olivar (2002) de fined this as behaviour which favours other people or groups or social objectives, without any prospect of an external reward, and increases the probability of generating positive interpersonal relationships based on positive reciprocity and solidarity, safeguarding the identity, the creativity and the initiative of the individuals or groups involved. The author studies prosocial behaviours in school contexts during peers' daily interactions and categorises the behaviours as helping, sharing, consoling and encouraging (Roche Olivar, 2002). A number of studies have revealed that people who possess the ability to move themselves from an egocentric position to seeing things from another's perspective, are more disposed to understand others' emotions and to carryout prosocial behaviours in order to satisfy the needs of others or to modify others' negative emotions (BaronCohen, 2001; Bonino et al., 1998; Jenkins & Astington, 2000; Oswald, 2010; Roberts & Strayer, 1996; Weil, Hayes, & Capurro, 2011). In particular, the studies by Stewart and Marvin (1984) regarding the behaviour of sibling care giving revealed that children who possess a higher perspective taking ability, measured through the false belief task, showed a greater number of care giving and comforting actions towards siblings in the mother's absence. The evidence is that 'good perspective-takers' are also 'good caregivers' supporting the hypothesis of a strong link between perspective taking and altruistic disposition. In relation to

prosocialbehaviour,somestudiesshowedthatperspectivetakingfavourstheabilityofsocial problem-solving, that is the ability to negotiate the solution of a hypothetical conflict in a collaborativeway (Marsh,Serafica,&Barenboim,1980), and increases helping behaviours towards people in need (Carlo et al., 2010; Endres & Michelle, 2003; Hinnant & O'Brien, 2007). Furthermore, the relationship between different components of perspective taking and prosocial behaviours has emerged in a recent study (Carlo et al., 2010). Additionally, research on empathy has produced some interesting data supporting the role of affective perspective taking when stimulating prosocial behaviours (Bonino et al., 1998; Findlay, Girardi, & Coplan, 2006; Oswald, 2010; Roberts & Strayer, 1996) and decreasing aggressiveness among peers (Bonino et al., 1998; Findlay et al., 2006). Starting with this evidence, some researchers have recently analysed the possibility of teaching perspective taking in preschoolers in specific training studies. In the design of this research, it is possible to establish a direct relationship between a particular experience of training, which involves only a selection of participants(experimentalgroup),andthesubsequentperformancesofchildrenduringcertain tasks. The results were discordant; some authors found perspective taking could not be learned by specific training (Flavell, Everett, Croft, & Flavell, 1981; Flavell, Green, & Flavell, 1986; Peskin & Astington, 2004; Taylor & Hort, 1990) while others argued for the efficacy of training on perspective taking abilities but recorded problems with generalisation and maintenance of changes over time (Guajardo & Watson, 2002; Knoll & Charman, 2000). A possible reason for the limited effectiveness of the training and for problems in generalisation and maintenance could be the excessive artificiality of the setting; in fact the majority of these studies adopted exclusively experimental techniques and laboratory structured situations, which enabled a high control of variables and a high level of rigor in experimental design at the expense of their ecological validity. Moreover, another reason could be the focus on cognitive perspective taking, thus ignoring the affective and visual aspects. In spite of these results, other studies have demonstrated the efficacy of specific training in promoting the ability of perspective taking (Appleton & Reddy, 1996; Charman & Baron-Cohen 1992; Pillow, Mash, Aloian, & Hill, 2002). Starting from these positive results, other studies have investigated the possibility of teaching perspective taking through different methods in preschoolers and generally obtained the same positive conclusions (Kloo & Perner, 2008; Miller, 2006). Some of this research, based on the relational frame theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001), which considers perspective taking a behaviour and therefore 'something that can be taught', involved children in specific conversation (Barnes-Holmes, McHugh, & Barnes-Holmes, 2004) and developing training studies which employed this kind of procedure to improve perspective taking abilities in children (Davlin, Rehfeldt & Lovett, 2011; Weil et al., 2011).

Other researchers have analysed which teaching method could be more useful and effective to promote perspective taking. The investigated methods included: positive and negative feedback, explanations, discussions and specific strategies of communication (Clements, Rustin, & McCallum, 2000; Melot & Angeard, 2003; Slaughter & Gopnik, 1996; Stanton-Chapman, & Snell, 2011), explanatory conversations (Pillow etal.,2002;Tenenbaum,Alfieri,Brooks,&Dunne,2008)and at last the role of linguistic abilities (Hale & Tager-Flusberg, 2003; Lohmann & Tomasello, 2003). Finally, some training studies, which address the problem of the excessive artificiality of the setting, were carried out in the ecological setting of a kindergarten

(Cigala& Fangareggi, 2011; Esteban, Sidera, Serrano, Amadò, & Rostan, 2010; Grazzani Gavazzi & Ornaghi, 2011; Ornaghi, Brockmeier, & Grazzani, 2011; Ornaghi & Grazzani Gavazzi, 2009). This brief review of training studies takes into consideration only research concerned with typically developing children; however, it is still very important to emphasise the presence of a number of studies that examine the possibility of teaching perspective taking abilities to children with a typical development, inparticular with autistic spectrum disorders (Fisher & Happé, 2005; Gould, Tarbox, O'Hora, Noone, & Bergstrom, 2011; Heagle & Rehfeldt, 2006; McGregor, Withen, & Blackburn 1998; Paynter & Peterson, 2013; Rehfeldt, Dillen, Ziomek, & Kowalchuk, 2007).

Methods

Goals and hypotheses

The main goal of the research was to verify the possibility of promoting perspective taking competences in preschool children using a specific training procedure. In particular, we considered three different components of perspective taking: cognitive, visual and affective. We expected a significant increase in the scores obtained by the experimental group, exposed to the training, at the post-test evaluation for all the variables assessed (Appleton & Reddy, 1996; Charman & Baron-Cohen, 1992; Esteban et al., 2010; Heagle & Rehfeldt, 2006; Kloo & Perner, 2008; Knoll & Charman, 2000; Ornaghi & Grazzani Gavazzi, 2009; Pillow et al., 2002; Rehfeldt et al., 2007). Moreover, we hypothesised that this increase would be significantly higher with regard to the control group, which was not exposed to the training (Hypothesis 1). Subsequently, on the basis of other studies, we wanted to verify if the ability of visual, cognitiveandaffectiveperspectivetakingcouldpositivelyinfluenceaprosocialdisposition (Bonino et al., 1998; Carlo, Knight, Eisenberg, & Rotenberg, 1991; Carlo et al., 2010; Findlay et al., 2006; Marsh et al., 1980; Oswald, 2010; Roberts & Strayer, 1996; Stewart & Marvin, 1984) (Hypothesis 2). Finally, a critical aspect considered was the maintenance of the changes obtained after the training in the experimental group. Much of the past research, in fact, has underlined the achievement of positive results, but they were temporary and not long lasting (Knoll & Charman, 2000; Pillow et al., 2002). Therefore, we followed up with the experimental group six months after the start of training to analyse the maintenance of change in perspective taking ability over time (Hypothesis 3).

Participants

Participants in this study were 60 preschoolers (25 males and 35 females) with typical development. All children were Caucasians of Italian nationality and were 4–5 years old (from 46 to 68 months; m=56.5 months); this is a crucial period for the development of the ability to attribute mental states and to assume another's point of view (Spence, 2003; Wellman, 2002; Wellman, Cross, & Watson, 2001). All the children attended the same kindergarten in a northern Italian town and came from families belonging to a middle-high social-economic level. The classrooms were defined as 'mixed', meaning children were of different ages (3, 4 and 5 years old). The sample was randomly subdivided into two subgroups balanced for age and gender: an

experimental group and a control group, each consisting of 30 children. In particular, experimental group was composed of 12 males(from 46 to 68months; m=56.0 months) and 18 females (from 47 to 68 months; m=55.9 months) and control group was composed of 13 males (from 48 to 68 months; m=55.5 months) and 17 females (from 49 to 68 months; m=57.5 months). Prior to data collection, parents' informed written consent was acquired, following the ethical guidelines defined by the American Psychological Association.

Procedure

The design of this research was a pre-test/post-test, quasi-experimental procedure with independent groups. The experimental procedure consisted of four phases: pre-test (T1), training (T2), post-test (T3) and follow-up (T4). In the pre-test phase (T1), which lasted 18 days, perspective taking ability, prosocial behaviour and aggressiveness in the experimental and control group were assessed. The first variable, measured by tests and tasks, was assessed individually for each child in two steps, each one lasting 15 minutes in a suitable and familiar room in the school. Prosocial behaviours and aggressiveness were analysed through ecological observations. Training (T2) lasted 15 days and immediately followed the pre-test. During this phase, which involved only the experimental group, several activities were completed including drawing, narration and role-play to promote perspective taking ability. Post-test (T3) began after training and lasted 18 days. In this phase perspective taking skills, prosocial behaviours and aggressiveness in the experimental and control groups, using the same procedures of pre-test, were assessed. Subsequently for the post-test (T4), six months after the start of the research, a follow-up phase lasting nine days measured perspective taking ability, prosocial behaviours and aggressiveness in the experimental group following the same procedures and measures of the post-test.

Material

Perspective taking

During the study, several instruments were adopted to measure the dependent variables; in particular the affective perspective taking was assessed by means of the Test of Emotion Comprehension (TEC) (Pons & Harris, 2000), using the Italian version validated by Albanese and Molina (2008), which aimed to investigate the children's understanding of emotions. The test lasted approximately 15 minutes and was administered during an individual interview with each child. The experimenter asked the participants to answer some questions after having carefully listened to a few short stories in which different situations cause emotional responses in the protagonist. The child was invited to answer by pointing to one of four alternative facial emotional expressions.

TEC is composed of 23 cartoon scenarios and contains 28 items, subsequently grouped into nine hierarchically organised variables (I–IX), according to the specific stages of child development. Specifically these variables are: I – recognition of facial expression of emotions; II – comprehension of external causes; III – understanding desire-based emotions; IV – understanding belief based emotions; V – understanding the influence of reminders; VI – comprehension of the regulation of an experienced emotion; VII – understanding the

possibility of hiding an emotion; VIII – understanding mixed emotions; IX – understanding moral emotions (Appendix 1). According to the authors' recommendations (Pons & Harris, 2000, 2005; Pons, Harris, & Doudin, 2002) the nine components may be grouped into three levels as a function of their stage of difficulty. Each of these subdimensions includes three components. In particular the first level (I, II, V), labelled as external, is the easiest. It focuses on external aspects of emotions. The second group (III, IV, VII), which may be labelled as mental, is intermediate in difficulty. It focuses on various mental aspects of emotions. The third group (VI, VIII,IX), which may be labelled as reflective, is the most difficult. It focuses on children's understanding of the way in which an individual can think about a particular emotionally charged event from more than one perspective. For each item, 1 point was given for the correct answer and 0 for the wrong one. Not all items contribute to the final scoring, some are simply control items. Through a process of encoding (Appendix 1), the score of each of the 9 components ranges from 0 to 1. For each level, score can range from 0 to 3. Finally, by summing the score of each component, it is possible to obtain the overall level of emotion understanding, labelled total. The child can obtain in this level a score ranging from 0 to 9. Several studies (Aznar&Tenenbaum,2013; Pons&Harris,2005; Ponsetal.,2002) demonstrated that the different components of the TEC are scalable (index of consistency I=0.676), that the scale is valid (coefficient of reproducibility R=0.904) and that TEC has a high test–retest correlation (r=0.83) within a three-month period and a 13month period (r=0.68). In order to measure cognitive perspective taking, a false belief task was used: the classic story of 'Sally and Anne' on unexpected transfer (Wimmer & Perner, 1983) in the pre-test phase and an equivalent task in the post-test ('The story of two mice, Stefano and Alberto', Liverta Sempio, Marchetti, & Lecciso, 2005). To assess their ability to assume the visual perspective of another person (visual perspective taking), two tasks were employed. The first was 'The turtle sleeping on the pillow', a re-adapted test invented by Flavell et al. (1981) using two different versions in the pre-test and post-test (a turtle and a grub). The second task was the 'Policeman task' by Hughes and Donaldson (1979) with two different versions for pre-test and post-test (policeman/thief and cat/mouse). In this test, the experimenter asked the children to put one of the characters in a safe place to hide from the other character, using a 3D scene built with Lego. The scene was situated so that the child's point of view never coincided with the character's point of view. Every child was asked to put the character in nine different hiding places. In every test, for both cognitive and visual components, 1 point was given for the correct answer and 0 for the wrong one. Itis important to emphasise, however, that for the 'Policeman task' it was necessary to do a dual encoding.

The experimental procedure was based on the request to the child of nine different resolutions of the game of hide and seek (identification of nine different caches), characterised by a total score ranging from 0 to 9. This score was re-coded into a binary score (1–0): value 1 for scores higher or equal to 8 and 0 for those lower than 8. Theencodingofthescoresprovidedtheidentificationofanindexofvisualandcognitive perspective taking (visual-cognitive P.T.), obtained by the sum of the scores achieved in the tests related to these components. Having proposed three tasks, the index of visual-cognitive perspective taking could take values in a range between 0 and 3 points.

Prosocial behaviour

In order to assess prosocial behaviours and aggressiveness during daily interaction between peers, non-participant ecological observations during two moments of free play (before and after lunch) and during lunch in the naturalistic context (in the outdoor or indoor spaces of the school for free play and in the classroom for lunch) were conducted. Each child was observed three times (free play before lunch, lunch, free play after lunch) on three different days. Every single observation lasted 45 minutes. The behaviours were operationalised based on four behavioural categories: helping, consoling/encouraging, sharing, aggressiveness. These categories were derived from Roche Olivar's code system of assessment of prosocial behaviours in the school context (2002). These behaviours comprised a series of typical actions performed by children in kindergarten: helping (such as helping a younger classmate, tidying up the classroom,helping a classmate end a task, taking a classmateto the bathroom, setting the table); consoling (such as getting near a crying classmate, listening to the reasons for his/her sadness, offering toys to a sad classmate, hugging him/her, mediating conflicts, encouraging a scared classmate); sharing (such as working or playing together, sharing objects, food or toys, asking for help or a favour); aggressiveness (such as beating, scratching, pushing someone, answering in an aggressive way, laughing at someone). With regard to aggressive behaviours, it is opportune to underline that in preschool age, aggressiveness is often experienced as play or exploration of the environment. Therefore, we chose to consider only physical or oral actions intentionally directed to hurt peers or teachers. The frequencies of behaviours in each category (helping, consoling/encouraging, sharing, aggressiveness) were computed. It is important to underline that the observers were naive, that is not aware of the intervention condition and study hypotheses.

Training

Training was aimed to promote perspective taking in children in the experimental group. In particular, in order to propose ecological activities consistent with the didactic methodologies adopted daily by the teachers, we selected three methodologies directly borrowed from the kindergarten context: drawing, narration and dramatisation. The contents of the activities were consistent with the subjects proposed by the teachers. Training, which lasted 15 days, was subdivided into nine different lessons, each lasting 45 minutes, carried out in a suitable room. Since the group was too large, we decided to create smaller subgroups comprising seven children. All the activities were conducted by the experimenter without any involvement from the teachers. Perspective taking is defined as a multidimensional ability to assume the visual, cognitive and affective perspectives of other people: therefore drawing tasks aimed to promote visual perspective taking, and the activities of narration and dramatisation were focused on understanding others' thoughts and emotions (cognitive and affective perspective taking). Some of these chosen activities have already been employed by other researchers in order to assess or to promote social and emotional competences (Cigala & Fangareggi, 2011; Corsano & Cigala, 2004; Di Pietro, 1999; Selman, 1976). Training activities in the experimental group followed this guideline:

Lesson 1

Introduction to perspective taking

The experimenter administered some empirical tests to the experimental group in order to highlight that the same thing changes if it is seen from different perspectives. The children were directly involved: they had to observe and describe how they saw an object assuming different points of view (for example watching an object from various positions in the classroom; describing a classmate standing in front of or behind them; looking at a classmate from different heights, putting themselves on their knees or on a chair; imaging how things appear from an airplane).

Drawing an object seen from different points of view. The experimenter asked the children to draw a basket of fruit in the centre of the table from the point of view of the classmate sitting in front of them. The children were invited to move to assume their classmate's perspective.

Lesson 2

Narration and dramatisation of Selman's social-moral dilemma (Selman, 1976)

The children had to create an end to the 'story of Holly' (Selman,1976). On the basis of the similarity of answers, children were divided into two groups. Each group had to play the story with the chosen ending and, in a second scenario, with the other ending so as to assume the perspectives of all the characters of the story and to simulate their emotional states.

Lesson 3 Narration and dramatisation of 'La storia di Teo' [Story of Teo] (adapted from Corsano & Cigala, 2004)

The experimenter told the children the story of Teo whospent a day in the park with his mother and experienced a series of situations and meetings, which caused various emotional states: happiness, sadness, fear, anger. The children had to imagine the various emotions experienced by the characters and simulate their facial expressions. Then the children were divided into small groups and role played the story, assuming different characters' roles.

Lesson 4 Drawing of a tree from different perspectives ('L'albero vanitoso' [The vain tree], Costa, 2004)

A story narrated in class by the teacher about the seasons and the protagonists of a tree and some animals (Costa, 2004) was used. The children had to choose an animal in the story (for example an ant or a crow) and to image how it saw the tree: they had to imagine being an ant at the feet of the tree or a crow flying in the sky. Finally, they had to draw the tree from the selected perspective.

Lesson 5 Narration an ddramatisation of 'La storia di Michela' [Story of Michela] (adapted from Corsano & Cigala, 2004)

According to the same protocol of Lesson 3, the experimenter narrated the story of Michela: a girl who spent a day in the swimming pool with her father and had a series of meetings and situations that were characterised by various emotional states (happiness, sadness, fear, anger). After reflecting on the various emotions experienced by the characters, the children interpreted the different roles of the story.

Lesson 6 Narration and dramatization of 'Che rabbia!' [Whatatantrum] (D'Allancé, 2000)

The subject of this tale was the emotion of anger. It was about Roberto; when he got angry, a huge red beast came out. But when the anger took shape, he understood how it could be harmful. The story was followed by reflection about the different emotions experienced by the characters, the causes of these emotions and the possible ways to control negative ones.

Lesson 7 Narration and dramatisation of 'La storia di Osvaldo il bassotto' [The story of the dachsund Osvaldo] (Di Pietro, 1999)

The experimenter narrated to the children a brief and simplified version of the original story. The subject of the tale was the emotion of shyness, as a cause of social isolation. Also in this case, the children were urged to reflect about the characters' positive and negative emotions and the previous situations causing these emotional states.

Lesson 8 Narration and drawing of the African tale 'Il Gigante Lulù' [The giant Lulù] (Ziliotto & Guarnieri, 2003)

This tale was part of the didactic programme about multiculturalism. The story was about a giant and the birth of pygmies. The children had to imagine the proportions of the body of the giant and of the pygmies. Then the experimenter asked the children to imagine themselves as a giant and a pygmy and to describe how things were seen from the two different points of view (the palms, the huts of the village, etc.). The children then drew the objects seen from the perspective of the giant and the perspective of the pygmy.

Lesson 9 Narration of 'Un bellissimo compleanno' [A wonderful birthday]

The protagonist of the story is Alberto, who experienced different emotions(happiness, anger, sadness, disappointment, fear), caused by some previous events. The narration

Implies an example of regulation of emotional expression in relation to displaying rules, an example of change in negative emotion, an example of prosocial behaviour towards a friend and, lastly, an episode of false belief. The narration implied the participation of the children, who interacted with the experimenter in concluding the story, interpreting Alberto's emotions and thoughts. Later, the story was narrated from the point of view of Alberto's mother.

Results

We calculated Cronbach's alpha coefficient (α) for internal consistency of each variable, obtaining acceptable values (α>0.6). We considered the index of visual and cognitive perspective taking (visual-cognitive P.T.) for visual and cognitive components of perspective taking (α=0.721) and the scores of the different levels of the TEC (external, mental, reflective, total) for the affectiveone (affective P.T.). Moreover, wecalculatedthefrequencyofprosocialbehavioursandaggressivenessgroupedinfour behaviouralcategories[helping (α=0.684),consoling(α=0.692),sharing(α=0.704), aggressiveness (α=0.715)],

as well as a total index by adding all positive behaviours (helping, consoling/encouraging, sharing) called total prosocial behaviour (α=0.695). Tables1 and 2 summarise the data for all the variables in each of the three phases for both groups. In order to underline the efficacy of training, a within-subjects comparison using the Wilcoxon's test was conducted to verify the presence of significant differences between pre-test and post-test scores within the subjects of the same sample (see Table 1). With regards to the experimental group, there was a large significant difference between pre-test and post-test in visual-cognitive perspective taking (Z= −4.26; p=.001). Significant differences were also found in the TEC, in particular for mental level (Z=−2.67; p=.008), external level (Z=−2.12; p=.034) and total level (Z=−3.19; p=.001). Lastly, significant differences were found for the prosocial behaviours of helping (Z=−4.12; p=.001) and sharing (Z=−3.16; p=.002), for the score of total prosocial behaviour (Z=−4.66; p=.001), and for aggressive behaviours (Z=−2.50; p=.012). For consoling, differences tended towards significance (Z=−1.78; p=.075). It is important to underline that all the mentioned variables

Table 1. Perspective taking by experimental and control group in pre-test and post-test (means and standard deviations).

		Experimental group				Control group			
		Pre-test		Post-test		Pre-test		Post-test	
Variables		Mean	SD	Mean	SD	Mean	SD	Mean	SD
Visual-cognitive P.T.		1.60	0.86	2.60	0.62	1.73	0.83	1.97	0.89
Affective P.T.	External	2.07	0.74	2.27	0.74	1.97	0.85	2.03	0.81
	Mental	1.97	1.07	2.50	1.17	2.00	0.98	2.13	1.11
	Reflective	0.87	0.68	1.03	0.85	0.93	0.87	1.03	0.85
	Total	4.90	1.49	5.80	1.69	4.90	1.88	5.20	1.56
Prosocial behaviour	Helping	3.97	2.33	7.07	2.38	3.90	2.95	4.23	2.60
	Consoling	1.90	2.70	2.77	2.67	0.80	1.30	0.73	1.02
	Sharing	13.57	11.68	18.30	16.30	13.48	11.84	12.78	9.87
	Aggress.	1.00	1.44	0.47	0.90	0.47	0.82	0.53	1.22
	Total	19.70	11.72	28.13	15.28	18.33	11.94	17.73	9.42

Table 2. Perspective taking by experimental group in pre-test and follow-up (means and standard deviations).

Variables		Experimental group			
		Post-test		Follow-up	
		Mean	SD	Mean	SD
Visual-cognitive P.T.		2.60	0.62	2.63	0.56
Affective P.T.	External	2.27	0.74	2.40	0.56
	Mental	2.50	1.17	2.40	1.35
	Reflective	1.03	0.85	1.50	0.82
	Total	5.80	1.69	6.30	1.58
Prosocial behaviour	Helping	7.07	2.38	8.83	6.09
	Consoling	2.77	2.67	4.37	3.58
	Sharing	18.30	16.30	17.53	15.39
	Aggressiveness	0.47	0.90	0.60	1.48
	Total	28.13	15.28	30.73	22.85

increased in the post-test, except aggressiveness, which decreased. With regard to the control group, no significant differences for any variable were found. In order to verify the real change obtained after training, we carried out a between subjects comparison of the scores of the experimental group and the control group using the Mann-Whitney test for both pre-test and post-test (see Table 1). Comparing the data obtained in the pre-test for both perspective taking and behaviours (prosocial and aggressiveness), no significant differences emerged between the two independent samples. Comparing the data obtained in the post-test for the same measures, there were significant differences in visual-cognitive perspective taking ($Z=-3.00$; $p=.003$), in the prosocial behaviours of helping ($Z=-4.44$; $p=.001$), consoling ($Z=-3.09$; $p=.002$), and in total prosocial behaviour ($Z=-3.04$; $p=.002$). Specifically, the experimental group obtained higher scores (see Table1). There were no significant differences in affective perspective taking based on TEC. In order to verify the maintenance of the positive results obtained by the experimental group in the post-test, we conducted a non-parametric statistical comparison between post-test scores and follow-up scores using Wilcoxon's test (see Table 2). This analysis did not reveal any significant differences between post-test and followup, except for the reflective level of the TEC ($Z=-2.21$; $p=.027$) which did significantly increase.

Discussion and conclusion

In reference to the possibility of promoting perspective taking ability through a specific training,theresultsrevealedapositivechangeinscoresofcognitiveandvisualperspective taking tasks and improvements in affective perspective taking, in particular in the TEC's mental, external and total levels. With regards to prosocial behaviour, a significant increase in prosocial behaviours (helping and sharing) emerged, together with a decrease in aggressiveness. The evaluation of these variables in the post-test immediately following training allows for the possibility of attributing these improvements to the training. The efficacy of the training is also confirmed by the comparison between the scores obtained by the control group, which did not show any significant differences in the variables between pre-test and post-test. These results demonstrated

that it is possible to exclude that the changes in these competences depended on the repetition of the tests or on the passing of time. Importantly, affective perspective taking was not significantly different between pretest and post-test scores obtained by the control group but, contrary to the hypotheses, no significant differences were found between the experimental group and control group in the post-test. This shows the possibility that there was an improvement in the performance in the TEC during post-test also in the control group, even though this improvement was not significant with regard to the same performance in the pre-test. This fact could be explained by a probable learning effect caused by the repetition of the tasks in a brief period. In fact, although the experimenter never corrected the children's answers during the administration of all the tests, the evaluation of affective perspective taking was administered twice: pre-test and post-test, which differed from other tasks. The second goal of the research was the evaluation of possible interdependence between the studied variables; that is if the ability of perspective taking (visual, cognitive and affective) could positively influence prosocial behaviour in children. The pretest intergroup comparison showed instead a similarity of both groups in all the prosocial behaviour categories. Only the experimental group, which comprised children who displayed an improvement in the ability of perspective taking, showed a significant increase in the behaviours of helping and sharing and in the score of total prosocial behaviour, accompanied by a decrease in aggressiveness. Therefore it is possible to conclude that children with a greater ability of perspective taking are also more inclined to behave in a prosocial way during peer interactions. With regard to the third and last goal, the follow-up session verified the maintenance of the acquired abilities by the experimental group. The scores of the experimental group did not show any significant differences between the results of the post-test and follow-up phase, confirming that the changes in the children's skills recorded after the training remained even after a period of six months. In the literature, similar research conductedin kindergarten underlined that increases in emotional competences were achieved after specific training, even if they were unable to demonstrate the maintenance over time of the acquired abilities due to the absence of a follow-up session (Esteban et al., 2010; Ornaghi & Grazzani Gavazzi, 2009; Ornaghi et al., 2011; Peskin & Astington, 2004). We decided to carry out this research directly inside the kindergarten, selecting ecological methodologies and contents, characteristic of the school context and familiar to the children, seeking to make the children as comfortable as possible during all the activities and to reduce the excessive artificiality of the laboratory setting, in which this kind of research is usually conducted. The general summary of the obtained results can be considered extremely interesting, not only in a theoretical way but also in an applicative outlook. With regard to theoretical implications, our results confirm past research tha tunderlines the fundamental role of the ability to understand other people's point of view a sapre-requisite for the development of prosocial ability (Astington & Jenkins, 1995; Baron-Cohen, 2001; Bonino et al., 1998; Fitzgerald & White, 2003; Jenkins & Astington 2000; Lalonde & Chandler, 1995; Oswald, 2010; Roberts & Strayer, 1996; Weil et al., 2011). The results show a wide possibility of working in kindergarten contexts, operating directly with teachers and children in order to promote the development of the ability to assume another's perceptive, cognitive and emotive point of view. It would be important to institute specific refresher courses for teachers to explain first of all the meaning and the role of perspective taking, and then to support them in structuring activities to promote this ability in

children. In particular, it is possible to trace the outline of some characteristics of this training: the choice of an ecological context to organise specific activities and the use of methodologies and contents characteristic of the kindergarten that are well known by teachers and children (narration, drawing and dramatisation). What does a child think in that situation? What does a mother feel in that context? What does my classmate see from his/her seat? These are the questions that, through different activities, are useful for problem-solving among children. In this way, children learn to understand other people's thoughts and emotions by playing, drawing and listening to stories in different situations. There are some limitations that should be addressed. The first methodological limit includes the small sample size; in future studies it would be opportune to replicate the research involving a bigger sample. Moreover, future studies could use other kinds of tasks for the evaluation of perspective taking, in particular for the affective dimension, in order to limit the learning effect. For this reason, we consider the introduction of an equivalent but not equal version of the test essential for the repeated assessment of emotional competence.

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Appendix 1

TEC scoring and encoding

Cartoon scenario	Item	Component	Item score (max)	Component score (max)	Encoding component score	
1	1	I Recognition	1	5	1	If the component score is greater than or equal to 4
2	2		1			
3	3		1			
4	4		1		0	If the component score is smaller than 4
5	5		1			
6	6	II Cause	1	5	1	If the component score is greater than or equal to 4
7	7		1			
8	8		1			
9	9		1		0	If the component score is smaller than 4
10	10		1			
11	11	III Desire	-	2	1	If the component score is 2
	12		-			
	13		-			
	14		-			
12	15		-			
	16		-			
	17		1		0	If the component score is smaller than 2
	18		1			
13	19	IV Belief	-	1	1	If the component score is 1
	20		1		0	If the component score is 0
14-17	21	V Reminder	-	1	1	If the component score is 1
	22		1		0	If the component score is 0
18	23	VI Regulation	1	1	1	If the component score is 1
					0	If the component score is 0
19	24	VII Hiding	1	1	1	If the component score is 1
					0	If the component score is 0
20	25	VIII Mixed	1	1	1	If the component score is 1
					0	If the component score is 0
21-23	26	IX Morality	-	1	1	If the component score is 1
	27		-		0	If the component score is 0
	28		1			