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MAKING INFERENCES AND INDIVIDUAL DIFFERENCES IN EMOTION UNDERSTANDING

During the last decade several studies focused on the role of language in mental state comprehension. These works proved that different linguistic skills – in particular lexicon, syntax and semantics – are closely related to emotion understanding (Harris & de Rosnay, 2002; Pons et al., 2003). At present, we know little about the influence of pragmatic abilities on children's emotion understanding. We hypothesize that pragmatic skills, particularly the ability of making inferences, can be considered as good indicators of children's emotion understanding. 80 Italian children between the ages of 4 and 7 years, attending their nursery or primary school, participate in the study. We used different tests to assess children's lexical and syntactic knowledge, their pragmatic competences and their emotion understanding. Results showed that – at a global level – syntactic and lexical abilities are the best predictors of emotion understanding, but making inferences is the only significant predictor of the most complex components (reflective dimension) of emotion comprehension.
Key words: emotion understanding, individual differences, pragmatics

Introduction

Pragmatics is a wide concept dealing with the cognitive, social and cultural study of language use in its context (Levinson, 1983). Therefore it can be placed at a crossroads of many different research areas: linguistics, semiotics, philosophy of language, anthropology, psychology and sociology. In literature, the birth of pragmatics is usually traced back to Charles Morris's work on the Theory of Signs. He defines pragmatics as the study of the relationships between signs and interpreters in contrast with the study of the formal relationships existing between

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signs (grammar) and the study of the relationships between signs and their referring objects (semantics). Beyond this "official birth", the origins of pragmatics comprehend a huge number of contributions, for example, from Linguistic Structuralism, which took into consideration the systemic relationships within the structures of a language, and the Linguistic Functionalism, which tried to link linguistic structures to their functions in specific contexts. Another field that has a say in the birth of pragmatics is Psychology: Bruner (1973) thought that the understanding of language means knowing how to use it, and studied early language acquisition by emphasizing the communicative function of early utterances. The School of Palo Alto held a therapeutic approach to communication emphasizing the role of metacommunication. A more recent psychological approach to the study of pragmatics is that proposed by Bara (1999) dealing with mental processes underlying clinical communication (cognitive pragmatics). Last, but not least, there is the contribution of contemporary Philosophy of Language, above all the so-called Philosophy of Ordinary Language. This was not a real theory, but a series of proposals showing a positive attitude toward natural language, stressing its discursive uses in everyday contexts. Philosophers of ordinary language assumed that the meaning of a sentence derives from a situational background that determines its truth conditions. In other words, the sense of an utterance depends on its specific use, namely, from its pragmatic dimension.

Going beyond the various attempts to define what pragmatics really is, from our point of view it is more interesting to move the focus to the aims of pragmatics. A pragmatic theory takes its research path in two different directions: one from the context to the language, and the other from the language to the context.

The first line of research looks into the effects of the context on the meaning of a word or sentence. We cannot understand the exact meaning of an utterance drawing only on syntactic or semantic roles because, at a certain point, we need to use contextual information in different ways. Most of the research following this direction of influence focuses on *deixis* and figurative language. The word deixis derives from Greek and means "pointing to" something. In verbal communication, deixis in its narrow sense refers to the contextual meaning of pronouns, and in its broad sense, what the speaker means by a particular utterance in a given speech context. Studies on this topic focus on the role of context in detecting ambiguity related to personal, spatial and temporal expressions (i.e., the exact meaning of "he", or "here", or "then" in a determined situation). Another means of investigating the influence of context on the meaning of a sentence is to examine the interpretation of opaque meanings or idiomatic language. The assessment of this kind of non-literal comprehension has often focused on the interpretation of classic idioms such as "It's raining cats and dogs" (Vance & Wells, 1994). The aim of these studies is to gauge whether the listener can interpret the meaning of the idioms and attend to the context which gives a clue to the non-literalness of the meaning.

The second direction of pragmatic research starts from the utterances and tries to study the effects they produce on the context, which in this case also includes the cognitive world of the interlocutors. Pragmatics is investigated here mainly by underlining its social and psychological dimensions, in particular, the great variety of linguistic uses aimed at modifying the environment, comprising other people's beliefs, desires and knowledge. Following this approach, we can say, borrowing John Austin's words, that talking means acting. Austin and Searle saw speech as a means to perform social acts. These acts consist of the intentional and overt communication of some content to another person and they are also called speech acts. The Speech Acts theory describes communication as subjects' interaction and defines the speech act as the minimal unit of conversational grammar. A speech event embodies three acts: a locutionary act (what is said), an illocutionary act (the effective action of the speech) and a perlocutionary act (the psychological and behavioral consequences of the speech) (Austin, 1962; Searle, 1969). More recently, Ninio and Wheeler (1984) defined the speech act as if it had two components: illocutionary force (that is the speaker's communicative intention) and interchange type (that is, a social act which is meaningful as a move in the currently operative social situation). This model tries to give a more dynamic perspective to speech acts, placing them in a conversational context. In a way, we could say that Ninio and Wheeler have also been influenced by Paul Grice's point of view, which considered the linguistic act as an expression of intention that results to be successful only if correctly intended by the listener. Communication is effective when the speakers respect the Cooperative Principle, which assumes that interactants cooperate in the conversation by contributing to the ongoing speech event, and a set of more specific conversational maxims (quantity, quality, manner and relation) (Grice, 1989). In Grice's theory, what is really important for a successful communication is the recognition of the speaker's intention. Often what is communicated or implied is very different from what is literally said, and pragmatics should aim at explaining how people can bridge the gap between sentence meaning and speaker's meaning.

Recent development of research in the field of pragmatics

Grice's theory is one of the most followed in recent developments in the pragmatics research field. His vision of language use had in fact a great power to change the perspective of communication, contrasting the traditional Code Model of Communication, with the Inferential Model of Communication. The Code Model sees communication as a sort of process of duplication of the speaker's thought by the listener, presupposing a perfect symmetry between the transmission and the reception of the message. This would involve a complete sharing of the context by the interlocutors and no metapsychological abilities. Following Grice's perspective, this is not possible in human verbal communication, which instead in-

volves a mixture of coding and inference (Sperber & Wilson, 2002). In Logic, inference is a deductive process that, from a certain number of premises, allows us to derive logical conclusions. In Psychology, inference is an important mental process, involving the creation and the successive evaluation of a hypothesis about the speaker's intended meaning on the basis of different cues he/she has provided. In a verbal interaction, the decoded linguistic meaning is only a starting point to a deeper inferential process. This is also the premise of Sperber and Wilson's Theory of Relevance (1986). This theory tried to provide a cognitive explanation to social interactive speech events: in verbal communication people try to be relevant to what they intend to say and to whom an utterance is intended. The Theory of Relevance offers a good way of integration between linguistic pragmatics and cognitive sciences because relevance is a basic property that allows the listener to select from the cognitive environment the most plausible hypothesis to understand the meaning of an utterance. Being relevant means to provide true, clear and sufficient information to interpret the meaning of an utterance.

Inference and mind-reading

In one of their recent works, Sperber and Wilson (2002) went deeper into the process of making inferences about the speaker's intentions. From their point of view, pragmatics should ultimately explain how listeners can fill the gap between the sentence meaning and the speaker's intended one. This is essentially a process of attribution of mental states to other people, namely, a mind-reading activity. Sperber and Wilson also go deeper into verbal comprehension, defending a view of pragmatic competences as a metapsychological process involving a special *metacommunicative module*, evolved as a human adaptation and specialization of a general mind-reading module. This last general model could not be applied as it is to the interpretation of intentions based on verbal cues because inferring a speaker's meaning from utterances involves a greater amount of information than, for example, inferring intentions from actions. Comprehension, following this approach, involves a sub-module of mind-reading, as an automatic application of a relevance based procedure to interpret linguistic utterances.

This kind of approach to pragmatics leads to some considerations about the link between pragmatic competences and general comprehension of mental states. Several studies in different fields have shown the existence of a close link between mind-reading abilities and communicative abilities. For example, studies by Bloom (2000) and Happé and Loth (2002) have shown that normal word learning engages the ability to track speakers' intentions and correlates to mind reading abilities assessed via false-belief tests. The ability to pass false beliefs tasks is also positively correlated with reference resolution (Mitchell, Robinson and Thompson, 1999) and with the interpretation of irony (Happé, 2003). Other studies in this area dealt with autistic children, who are generally poor in theory of mind abilities, assessing their

linguistic competences: in autistic children, both general mind reading and communication skills are impaired (Baron-Cohen, 1995; Sigman and Kasari, 1995). In particular, pragmatic abilities came out as closely related to autistic children's performances on theory of mind tasks. Eisenmajer and Prior (1991) used a test on pragmatic ability, while Frith, Happé and Siddon (1994) adopted a test of real-life social adaptation including items requiring pragmatic skills, Charman and Shmueli-Goetz (1998) evaluated narrative production (particularly the use of referential devices). In all of these studies, pragmatic abilities, however measured, emerged as closely correlated with mental state understanding.

To go over the main points: following Sperber and Wilson's approach, we assume that the main goal of pragmatics is to clarify the comprehension process of the speaker's intended meaning. This is substantially an exercise of mind-reading, involving an inferential attribution of intentions. Thus, we can assume that pragmatics and theory of mind are related by definition, and indeed this relationship is supported by several empirical results. Moreover, some interesting studies (i.e. Astington & Jenkins, 1999; Call & Tomasello, 1999; Peterson & Seagal, 1995), tried to explain the direction of this relation: most of them agree with the hypothesis that linguistic ability is required for successful performance on theory of mind tasks. Therefore it could be possible to predict children's ability to comprehend other people's beliefs, desires and intentions, assessing their linguistic pragmatic skills, in particular, their ability in making inferences. Following this path, it could be very interesting to explore the relation between children's ability to generate inferences and their level of mental state comprehension. The aim of our research goes in this direction, particularly focusing on children's understanding of emotions.

Pragmatics and emotion understanding

Emotion understanding is one of the most important constituents of social understanding. It deals with comprehension of the nature, causes, consequences and possibilities of control and regulation of emotions. These various aspects of emotion understanding develop with age and may be grouped on three hierarchically organized levels. The understanding of different *external* features of emotion (facial expressions, situational causes, reminders) emerges at around 4-5 years; the understanding of various *mental* aspects of emotion (impact of desires and beliefs, distinction between real and apparent emotions) appears at around 6-7 years. Finally, the understanding of cognitive *reflection* (mixed and moral emotions, mental control of emotion) emerges at around 8-9 years. Several studies have confirmed the validity of this developmental model in different countries (Harris, 2000; Tenenbaum et al., 2004), but from other recent works different patterns have seemed to emerge. For example, an extensive study on emotion understanding on a large sample of Italian children, using the same methodological procedure of Pons, Harris et al.

(2004), showed a different developmental model, more similar to the expected one, according to the literature (Albanese et al., 2006). Thus, recent studies have begun to address the question of individual differences (for a review, see Harris, 2000). Such differences can be considered as expressions of stable psychological and social characteristics of children. Several studies have demonstrated that individual variations appear quite early, remain quite marked even in late childhood, and seem to be the expression of a relatively general psychological characteristic (Pons et al., 2003). During the past decade, an increasing number of studies have tried to find the possible causes of such individual differences in this development. Several cognitive, affective and social factors play different roles in children's emotion understanding. Among the cognitive factors, language seemed to take on a central position, but it is not clear which aspect of language is the most helpful in children's emotion comprehension. Various directions of research provide support for a crucial role of language and conversation in predicting emotion understanding. First of all, children's language ability is a good predictor of their emotion understanding. In this area, many researches have focused on lexical, syntactic and semantic aspects linked to emotion understanding (Harris et al., 2005; Astington & Jenkins, 1999; Pons, Lawson, Harris & de Rosnay, 2003). Secondly, deaf children, born into non-signing families show a delay in their understanding of mental states. By contrast, deaf children who learn to sign in a home with other signers perform like normal children in theory-of-mind tasks (Peterson & Siegal, 2000). This means that language has a powerful influence on theory of mind, independently of the kind of linguistic input. Other studies focused on the exposure to early conversation as critical contexts in which children construct an understanding of intentions and beliefs. These investigations usually start from a Vygotskian perspective, considering language as a tool for constructing a social context and organizing thoughts. Conversation with adults is a way of "co-construction" of meaning which children internalize and develop in several contexts. Research in this field support the idea that both the content and the style of mother-child discourse have an influence on individual differences in emotional understanding. Maternal discourse about emotional states is closely related to children's development of emotion understanding (Denham & Auerbach, 1995; Laible, 2004). Regarding the style of the discourse, Laible (2004) and Laible & Thompson (2000) found that mothers who used a more elaborate style (rich in details and emotional and mental state terms), promote a better emotion understanding in their children. In subsequent research, Laible (2004) demonstrated that maternal elaboration is a better predictor of children's emotion understanding, compared to the content of their discourse. These findings are in line with the ones by Harris (2005), who underlined the role of conversation to which children are exposed in their comprehension of mental states. Mother's pragmatic intent, especially her efforts to introduce varying points of view into a given conversation, seems to be the underlying and effective source of variation in children's comprehension of mental states and emotions.

Accordingly, pragmatics seems to come out as one of the most important factors in children's emotion understanding, but there are few studies on this topic, so its role in determining individual differences is still unclear (Harris, de Rosnay & Pons, 2005). A mature pragmatic functioning reflects comprehension of the speaker's mental state, involving inferences about his/her intentions, desires and emotions. The width and number of facets of the concept of pragmatics make the study of its influence on emotion understanding a real challenge. Assuming Sperber and Wilson's approach to pragmatics, we think it is extremely important to investigate children's ability to make inferences as a significant measure of their pragmatic skillfulness. According to the abovementioned results that have been found in the literature, we argue that this ability should be connected to children's understanding of mental states, and particularly, we focus on emotions.

Unanswered questions and our current study

Could pragmatics help explain individual differences in emotion understanding? If so, is it a better predictor of individual differences than other linguistic or cognitive factors? How could we assess that? Which instruments should be used?

We aim at investigating the role of children's ability to make inferences in their level of emotion understanding. Particularly, we try to compare the power of different linguistic competences in predicting individual differences in emotion comprehension. We hypothesize that pragmatic skills can be better indicators of children's differences in emotion understanding than semantic and syntactic abilities.

Method

Subjects

Eighty Italian children (39 male, 41 female) between the ages of 4 and 7 years, attending nursery or primary school in Monza (Milan), participated in the study. The children were subdivided into four age groups: 4years (M = 4 years and 1 month; sd = 3.5 months), 5 years (M = 5 years and 0 months; sd = 3.9 months), 6 years (M = 5 years and 11 months; sd = 3.2 months), and 7 years (M = 7 years and 1 month; sd = 2.6 months). They were all from middle-class Italian-speaking homes, without any cognitive or behavioral problem.

Instruments

Five tools were used to assess different children's abilities.

Non-verbal cognitive factors were evaluated via Raven's *Coloured Progressive Matrices - CPM* (1969). They are based on spatial abilities and measure the capacity of non-verbal reasoning. Children get one point per each exact answer (min. 0, max. 36). This test was administered in order to discover – and consequently exclude – any subject with problems with non verbal logical thinking. All

the subjects obtained high scores on CPM, compared to those of the Italian normative sample, therefore all the 80 children were included in the study.

Syntactic and semantic knowledge was assessed by Bishop's *Test for Reception of Grammar – TROG* (1982; Italian translation and standardization by G. Sartori et al., 1985). It is composed of 80 figures, divided in 20 blocks (4 figures per block): each block evaluates a specific lexical or syntactic-semantic ability. Children get one point per each succeeding block (all four items of a block correct; min. 0, max. 20).

To evaluate children's pragmatic knowledge two different instruments were used:
– Subtest 2 of *Test of Language Competence*: *Making Inferences - TLC* (Wiig & Secord, 1989; Italian translation for this research, by E.Farina, 2006). This subtest evaluates the ability to make permissible inferences on the basis of existing causal relationships or chains in short paragraphs.. It is composed of 16 items, each one describing an event chain in which one or more causal links are missing. For each item the child is required to make two plausible inferences based on two spoken sentences describing the lead-in and the conclusion of the causal event chain. The child selects the two plausible inferences from four picture choices, designed to elicit a yes or no answer accordingly to the child's judgement of correctness. For no responses or one or two correct responses per item, children get 0 points; 3 correct responses per item correspond to 1 point; 4 correct responses correspond to 3 points (min. 0, max. 48).
– *Children's Communication Checklist - CCC* (Bishop, 1998; Italian translation by E. Mariani, M. Pieretti and G. Valeri, 2000). The checklist was completed by teachers who had known the child for at least 3 months. It is composed of 70 statements describing aspects of children's behavior. For each statement the teacher is asked to judge if the statement "does not apply", "applies somewhat" or "definitely applies". Five subscales assess inappropriate initiation, coherence, stereotyped conversation, use of context and rapport. Score on these subscales provides a pragmatic composite. Score: "does not apply" answers get 0 points; "applies somewhat" answers get 1 point; "definitely applies" answers get 2 points. A + sign has to be assigned to items describing a child's strengths and a – sign to those describing weaknesses.

Children's emotion understanding was assessed via *Test of Emotion Comprehension - TEC* (Pons & Harris, 2000). The TEC is the result of an extensive survey of the literature on emotion understanding by the authors. By bringing together a substantial body of research, Pons, Harris & de Rosnay (2004) classified at least nine different components of the children's emotion understanding: recognition of facial expression of emotions; comprehension of external causes; understanding of desire-based emotions; understanding of belief-based emotions; understanding of the influence of reminders; comprehension of the regulation of an experienced emotion; understanding the possibility of hiding an emotion; understanding of mixed emotions; understanding of moral emotions. The Test of

Emotion Comprehension enables an assessment of the understanding of these nine components simultaneously. The TEC consists in an A4 book (male and female versions) presenting a series of cartoon scenarios placed on the top of each page; the bottom part of the same page shows four possible emotional outcomes depicted by facial expressions. While showing a cartoon scenario, the experimenter tells the child a story. After hearing the story, the child is asked to attribute an emotion (happy, sad, angry, scared or just alright) to the main character by pointing to one of the four depicted emotional outcomes (non-verbal responses). Children get one point per component succeeded (min. = 0, max. = 9). In Italy, a TEC Standardization Project has been started by a group of researchers of different universities, coordinated by Ottavia Albanese. The Italian version of the test has been translated by the Project group and edited by Francisco Pons, one of the authors, with whom administering procedures as well as inclusion criteria for children in the sample have been discussed.

Procedure

Tests were administered individually to the children during their daily attendance in nursery or primary schools. Administration of all the tests took three sessions, each one lasting approximately 30 minutes, with a distance of five-seven days between sessions. First session: administration of the Colored Progressive Matrices. Second session: administration of the Test for Reception of Grammar. Third session: administration of Test of Language Competence – Subtest2: Making Inferences and Test of Emotion Comprehension. The Children's Communication Checklist, after a short explanation about how to interpret the items and fill in the questionnaire, was distributed to the teachers at the end of the three testing sessions. They filled in one checklist for each child and returned it within two weeks.

We analyzed individual differences in emotion understanding. Afterward, we conducted zero-order correlation analyses between data from TEC, TROG, TLC, CCC, age, gender; partial correlations controlled for age and gender; hierarchical regression analyses of TEC (one for the overall score and three different regression analyses for *external, mental* and *reflective* dimensions) on TROG, TLC and CCC.

Results

Data analysis shows that children display a clear improvement with age in their emotion comprehension. The overall score regularly increases with age: $F(79) = 15.73$; $p < 0.001$ Considering the three sub-dimensions, age has a significant effect: external $F(3, 76) = 13.06$; $p < 0.001$; mental, $F(3, 76) = 6.05$; $p < 0.001$; reflective, $F(3, 76) = 5.58$; $p < 0.002$.

No differences in overall score are recorded in relation to gender: $F(79) = 0.599$; $p = 0.441$, but the presence of siblings has a significant impact on emotion comprehension: $F(79) = 12.13$; $p < 0.001$.

Table 1. Number of children by level of emotion understanding and mean level of emotion understanding by age

Age	N	Level of emotion understanding								M	SD
		1	2	3	4	5	6	7	8		
4 years	20	3	5	7	2	3				2.85	1.27
5 years	20	1	1	4	2	6	4	2		4.55	1.64
6 years	20			4	4	4	5	2	1	5.00	1.49
7 years	20				3	6	4	5	2	5.85	1.27
Total	80	4	6	15	11	19	13	9	3	4.56	1.78

Figure 1. Total score by age (N = 80)
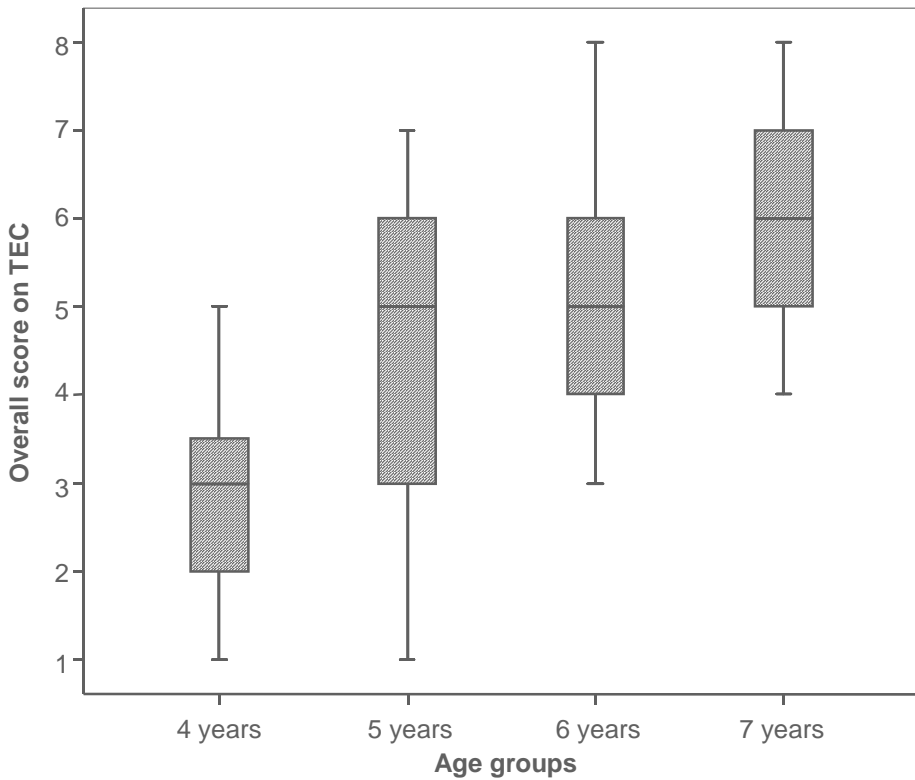
Table 2. Correlations between TEC, TROG, TLC, and CCC

	TROG	TLC	CCC	TEC
TROG	1			
TLC	0.503***	1		
CCC	0.246*	0.392***	1	
TEC	0.535***	0.439***	0.305**	1

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Confirming what has been found in the literature (Pons et al., 2004; Albanese et al., 2006), individual differences are remarkable in each age group (see Table 1 and Figure 1). Such variations therefore appear to be linked neither to gender nor to age, and call for further investigation.

In order to evaluate the relationships between emotion comprehension and the considered communicative aspects (lexicon, syntax and pragmatics), a correlation analysis was conducted controlling for age. All the linguistic variables are significantly and positively correlated with emotion comprehension (see Table 2). In particular the highest correlation is between TEC and TROG (lexical and syntactic competences): $r(78) = 0.54$; $p < 0.001$; there are also positive and significant correlation indexes between TEC and TLC (making inferences): $r(78) = 0.44$; $p < 0.001$, and between TEC and CCC (pragmatic communication): $r(78) = 0.31$; $p < 0.05$.

A first hierarchical regression analysis was conducted to observe the effects of lexicon and syntax (TROG) and pragmatics (TLC and CCC) on the variance of emotion understanding (TEC overall score). We chose to use hierarchical regression considering that the literature revealed a powerful effect of grammar on emotion comprehension: does this effect remain strong even when other linguistic and communicative factors are taken into account? Therefore in the first step, we introduced the TROG: it accounted for 54% of the variance in emotion understanding: $F = 83.21$; $p < 0.001$. In the subsequent step the pragmatic measures were introduced, TLC and CCC: the input of these measures caused a R2 change of 5%: TROG maintains the most significant effect, but TLC is significant too (see Table 3).

Table 3. Hierarchical regression of emotion comprehension (overall score on TEC) on TROG, TLC, and CCC

Model and predictors	β	t	R^2	R^2 change	F
1 TROG	0.735**	9.12	0.540	0.540	83.21**
2 TROG	0.580**	6.00			
TLC	0.213*	2.08	0.540	0.540	83.21**
CCC	0.095	1.11			

**$p < 0.001$; *$p < 0.05$

Table 4. Hierarchical regression of reflective dimension on TROG, TLC, and CCC

Model and predictors	β	t	R^2	R^2 change	F
1 TROG	0.435**	4.07	0.189	0.189	16.60**
2 TROG	0.142	1.08			
TLC	0.446*	3.22	0.309	0.119	10.27**
CCC	0.016	0.144			

**p < 0.001; *p < 0.002

Three hierarchical regressions have been run in order to evaluate the effects of syntax, lexicon (TROG) and pragmatics (TLC and CCC) on the *external, mental* and *reflective* dimensions of emotion comprehension. The most interesting result is about the reflective dimension (which comprises the most complex component of emotion understanding). As shown by Table 4, after having entered the pragmatic measures, the effect of lexicon and syntax (TROG) becomes non significant, while the ability of making inferences (TLC) holds the only significant effect on the reflective dimension. Entering TLC and CCC caused a R^2 increase of 12%. Observing the effects of the distinct variables, the score on TLC, has the only one significant effect on the variance of reflective dimension (β = 0.446; t = 3.22; p < 0.002).

Discussion

Individual differences in emotion understanding are noteworthy in each age group. Emotion comprehension increases with age and presence of siblings, whereas no significant differences due to gender have been found. This could be a first indication that, after considering the chronological age, there are other factors implied in the emergence of differences in the ability of understanding emotions. Some of them could be linked to children's family environment: the presence of siblings is considered an important factor for the development of ToM (Denham, 1986); it engages young children in shared activities and conversations which promote a good comprehension of reality and non observable dimensions, like mental states (Nelson, 1996).

Linguistic and communicative factors have been considered in their relationship with individual differences in emotion understanding. The correlation analyses, even after controlling for age, indicate the existence of a significant positive relationship between emotion comprehension and the communicative and linguistic measures taken in consideration. Emotion comprehension resulted as particularly linked with good lexical and syntactic

competences, but also with other communicative aspects, belonging to pragmatics, like the ability of making inferences. Observing the regression analyses, at a global level lexical and syntactic abilities (TROG) are the most important variables to explain the variance of emotion comprehension, compared to the ability of making inferences (TLC), general pragmatic measure (CCC). Nevertheless, looking at the three dimensions of emotion understanding, external, mental and reflective, syntactic ability has no significant effect on the comprehension of the most complex components of emotion understanding anymore: the possibility to control emotions through cognitive strategies, moral emotions and mixed emotions. The only one significant effect is the ability of making inferences. This is a complex cognitive ability that requires managing several elements in order to build a mental representation of a situation from which it is then possible to infer non observable states like emotions and thoughts. The Making Inferences subtest of the TLC assesses what has been referred to as secondary representation or *metarepresentation* that mediates the ability to take into account the mental states of other individuals (Leslie, 1987). Passing the three *reflective* components of emotion understanding is closely related to children's ability of abstract reasoning, managing and structuring different sources of information deriving from the physical, social, linguistic and communicative contexts to build complex representations. Verbal input must be linked to a pre-existent background of knowledge in order to infer the correct meaning of a situation and, in this case, to comprehend people's emotions.

These results confirm the hypothesis that pragmatic aspects play a key-role in promoting emotion comprehension, showing that syntactic and lexical competences alone are not sufficient to explain the importance of communication for emotion comprehension. Pragmatic aspects, in particular the ability of making inferences, proved to play a key-role in promoting emotion understanding, especially the most complex aspects of emotion, regarding mixed and moral emotions and mental regulation of emotions. Making inferences is fundamental for the comprehension of speakers messages. Comprehension of speakers messages requires not only semantic and syntactic knowledge, but also the ability to infer speakers' intentions. Using speakers' indication of referred persons or objects, and presupposed common knowledge, the listener may infer what the intended meaning is (Adams, 2002).

Therefore, children who are good at making plausible inferences and understanding of syntactic rules and structures, are also good at comprehending others' emotions. These first results encourage a deeper investigation of different communicative aspects in their relationship with emotion comprehension. Future research should clarify this relationship studying, for example, the abilities of emotion comprehension also in children with specific language impairments and pragmatic language impairments. Another interesting way to carry on the

research in this area deals with the kind of relationship between emotion comprehension and language: is it possible to find a causal link and direction? Training studies developing single aspects of language and communication in order to observe their effects on understanding of emotions, could help to answer this question.

In conclusion, the results of this study raise several considerations and incentives to deepen the investigation of the potential sources of individual differences in emotion understanding. A better knowledge of these differences, their causes and their development, would also have educational implications. The identification of specific aspects of language as important factors influencing children's understanding of different features of emotions, makes it possible to contemplate programs of intervention. Such programs would give the opportunity to the children to better comprehend their own and other people's emotions and, as a consequence, to develop a good level of social integration.

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