

Comprehension of communicative intentions: The case of figurative language

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This study is concerned with children's comprehension of the communicative meaning of conventional figurative communication acts. We assume that comprehending the communicative meaning of both figurative and non-figurative communication acts involves the same cognitive processes. We hypothesize that the complexity of the mental representations involved accounts for the increasing difficulty in comprehending the very same conventional figurative expression, uttered with a sincere, deceitful or ironic intent. A pre-test on 20 children (7 to 7; 6 year-olds) ascertained the conventionality of the 6 figurative expressions used as the experimental material, e.g. *To be as mute as a fish*. For each figurative expression we created three different communicative contexts, within which that expression acquired either a sincere, deceitful or ironic communicative meaning. In the experiment, we presented 108 children aged 7 to 10; 6 years with brief audio-recorded stories, each involving a figurative expression in a specific communicative context. The children's performance reflects the predicted trend in difficulty for comprehending the use of the very same figurative expression, from the easiest to the most difficult: sincere, deceitful, ironic. Our results are in favor of a unifying framework for explaining the comprehension of figurative and non-figurative communication acts.

Keywords: cognitive pragmatics, speaker's meaning, development, communication and inferences

1. Introduction

The aim of the present investigation is to analyze the cognitive processes underlying the comprehension of the communicative intention of a very same conventional figurative act proffered in different communicative contexts, i.e. sincere, deceitful and ironic. In a figurative communication act the speaker's intended meaning differs from the literal meaning. Examples of the figurative expressions investigated here are: hyperboles, where the speaker exaggerates the reality of some situation (e.g., *John is a genius*, to mean he is very intelligent), similes, where concepts from different knowledge domains are explicitly compared (e.g., *Mary is as mute as a fish*, to indicate she is able to keep a secret), metaphors, where concepts from different knowledge domains are implicitly compared (e.g., *Bob is a fox*, meaning he is smart), and idioms, intended as "dead" or "frozen" metaphors in which the speaker's meaning cannot be derived (e.g., *Mark's cold-blooded*, to indicate that he is a ruthless boy).

We shall use the term figurative expressions to refer to figurative communication acts, and we hypothesize that the different complexity of the mental representations involved accounts for the increasing difficulty in comprehending the very same conventional figurative expression uttered with a sincere, deceitful or ironic intent. To the best of our knowledge, none of the theories in the literature empirically investigate at the same time different communicative meanings of the same figurative expression. We adopt a cognitive developmental perspective to test the predictions deriving from our assumptions. Thus, we concentrate on how a given function develops from the infant to the child and the adult (Bara, 1995; Bosco, 2006; Karmiloff-Smith, 1992). The relevance of our theoretical account relies in the possibility to predict the *emergence* of *several* pragmatic phenomena; thus, it is more powerful than any account which can explain only the adult's functioning, or the emergence of a single pragmatic phenomenon, or comprehension of several pragmatic phenomena but only in the adult system. For this reason, and also because failures in re-constructing communicative meanings are more likely to occur in children than in adults, the participants in our experiments are children aged from 7 to 10;6 years.

Failures are suitable to shed light on the complexity of the attribution of the communicative intention process (Bosco, Bucciarelli & Bara, 2006).

Grice (1969; 1989), Lewis (1975; 1979), and other philosophers of language, argue that comprehending figurative expressions involves different mental processes from those used to comprehend non-figurative expressions. More in general, the standard pragmatic model assumes the priority of literal meaning in comprehending the speaker's communicative intention (Searle, 1979; Grice, 1989): understanding a figurative expression involves the recognition of the defectiveness of a sentence meaning in the context of enunciation, and then the reconstruction of the figurative meaning. Thus, comprehending a figurative expression is always more difficult than comprehending the corresponding literal meaning.

By contrast, even if from different theoretical perspectives, other authors adopt a continuity view of the mental processes underlying the comprehension of figurative and non-figurative communication acts; the literal meaning has no priority in comprehending the speaker's communicative meaning. For example, Ortony, Schallert, Reynolds and Antos (1978) argue that comprehending the figurative meaning of speech acts is not more difficult than comprehending comparable literal communication acts: people can understand novel metaphors, i.e. metaphors they are not familiar with, as quickly as the comparable literal communication acts (Blasco & Coninne, 1993; Albritton, McKoon & Gerrig, 1995). Further, listeners can automatically access an utterance's non-literal meaning without first accessing its literal meaning (Gibbs, 1993; Glucksberger & Keysar, 1993). Gibbs (1994; 2001) argues that the literal meaning is not easier to comprehend than the metaphorical meaning given that both rely on the interlocutors sharing a common ground that enables them to understand what a given communication act means. Following the tenets of Relevance theory (Sperber & Wilson, 1986/1995), Wilson and Carston (2006) argue against the standard pragmatic model of figurative language comprehension and in favor of the continuity view: there is no clear cut-off point between "literal" utterance, hyperboles, metaphors and similes, and that they are all interpreted in the same way. The wide and diverse set of accounts under the term continuity view differ along several aspects. However, they share the continuity assumption on the mental processes involved in non-figurative language

and figurative language comprehension. The experimental data in the developmental literature are in line with the continuity view. For example, Levorato and Cacciari (1995) find that children, in order to deal with figurative language, do not use any special strategies with respect to those they use in dealing with literal language.

In line with the continuity view, we assume that comprehending the communicative meaning of figurative expressions (i.e., metaphors, idioms, hyperboles and similes) involves the same cognitive processes as comprehending the communicative meaning of literal communication acts. Although we do not intend to enter the dispute between the standard view and the continuity view, our assumptions are in line with the latter one. In particular, we focus on the attribution of the communicative intentions process, and we assume that the complexity of the mental representations involved, is a factor which determines the difficulty of comprehension of the communicative meaning of both 'literal' and conventional figurative expressions. None of the studies in the pragmatics literature address this crucial aspect of communication, maybe because there have been few attempts to provide a unified account of human pragmatic competence.

In this paper we analyze the cognitive factors that, according to our theoretical perspective, affect the difficulty of comprehension of the communicative intention of non-figurative communication acts (Section 2). Then, we extend our account to the comprehension of the communicative intention of conventional figurative expressions, and we present an experimental validation of such an account (Section 3). Finally, we discuss the results of our former studies in relation with the results of the present investigation and in the light of a unified theoretical account of the emergence of pragmatic competence (Section 4).

2. Mental representations in comprehending communicative intentions

Cognitive Pragmatics is a theory of the mental processes involved in intentional communication (Airenti, Bara & Colombetti, 1993a; 1993b, see Bara, 2009 for an overview). According to the theory the beliefs shared by the agents in a communicative exchange allow the partner to understand

the actor's communicative intention. Clark and Wilkes-Gibbs (1986) affirm that two agents, in order to communicate, have to maintain communication within the space of their shared knowledge. Clark (1996) defines such a space as the common ground, that is, the sum of the knowledge, beliefs, and presuppositions that a person shares with another human being, a group of persons, or with all human beings. The range of the common ground changes and increases in accordance with social, cultural and private affinities shared by two or more persons (Clark, 1996). However, in order to communicate, an agent must also believe that all of the other participants in the communicative interaction share those very same common beliefs. Airenti et al. (1993a) define a shared belief as one that each participant assumes to be held by all of the other participants; a crucial feature of shared belief is its subjectivity. Thus, the notion of shared belief differs from objective concepts like *common knowledge* (Lewis, 1969), or *mutual knowledge* (Schiffer, 1972). A shared belief always expresses the standpoint of one of the interlocutors: no agent can ever be sure that all the other participants hold beliefs that are the same as his or her own. In our model, all the inferences involved in comprehending a communicative act are drawn in the space of the actor's shared beliefs.

Most relevant in communication are shared beliefs concerning stereotyped patterns of interaction; these are referred to as *behavior games*. The concept of script (Shank & Abelson 1977) can be considered an ancestor of the concept of behavior game formulated by Airenti, Bara and Colombetti (1984; 1993a). A behavior game is a plan at least partially shared by the participants in a dialogue. One of the most important difference between the notions of script and behavior game is that the latter allows us to make predictions on the complexity of the mental representations underlying the comprehension and production of a pragmatic phenomenon (see Airenti et al., 1984; 1993a, for a detailed description of behavior game).

A main assumption of Cognitive Pragmatic theory is that intentional communication requires behavioral cooperation between two agents; this means that when two agents communicate they act on the basis of a behavior game. Consider, for example, the communicative exchange:

[1] Ann: 'Could you please bring children to school this morning? I'm

free in the afternoon!'

Ben: 'Sorry, I'm too late.'

In order to fully understand Ann's communicative intention Ben has to recognize the behavior game she bids through the communication act. Thus, conversational cooperation requires that Ann and Ben share the knowledge of the behavior game in play. That is in our example:

[2] [FAMILY-MANAGEMENT]:

- Mother or Father bring children to school
- Who brings children to school in the morning does not pick them up in the afternoon

Behavior games have a fundamental role in communication: the meaning of any communication act can only be fully understood when the game the move is part of has been clearly identified. Thus, the Cognitive Pragmatics theory assumes that the literal meaning of an utterance is necessary, but not sufficient to reconstruct the meaning conveyed by the speaker (see also Gibbs, 1994; Recanati, 1995). A behavior game can only be played when two agents share its knowledge. The beliefs that the partner thinks he/she shares with the speaker are concerned with the behavior game at play as well as with contextual information, such as the status of the participants in the dialogue, the spatial location of an object referred to by the speaker, and so on (see, Bosco, Bucciarelli & Bara, 2003; 2004). This information guides the partner in the reconstruction of the speaker's communicative intention.

Following the tenets of the Cognitive Pragmatics theory, Bucciarelli, Colle and Bara (2003) consider the sort of mental representations that must be constructed in order to comprehend the beliefs and intentions of the participants in the dialogue. In particular, they deal with non-figurative language and argue that reasoning on these representations can involve the detection of conflicts among them. The conflicting mental representations involve a difference between what is communicated and what is privately entertained by the speaker. In the case of no conflict, we are dealing with standard communication, that is the speaker proffers the utterance with a sincere communicative intention. Directs, conventional indirects, and non-

conventional indirects are all examples of *standard* communication, namely involving a speaker whose beliefs and communicative purposes are in line with what he or she means. In terms of mental representations, the partner has merely to refer the move to the speaker's behavior game. Thus, comprehending standard acts involves the use of default rules of inference, i.e. rules which are always valid unless their consequent is explicitly denied (cf. Reiter, 1980). The default rules of inference can only be applied when there is no conflict between the mental states overtly expressed by the agents, and the mental states that the partners assume they are privately entertaining. If there is no trace of conflicting representations, the default assumptions of sincerity, well-informedness, capacity, etc., lead to the standard path of communication.

In contrast, in case of *non-standard* communication acts, the cognitive processes involved are more subtle in that the participants in the interaction hold conflicting mental representations. In case of comprehension of non-standard acts, once the conflicts have been detected, the default inferences are blocked, and classic inferential processes are followed. Examples are deceit (private non-standard) and irony (shared as non-standard by the agents). In addition, among non-standard phenomena, representations involving a belief expressed by a speaker which is in conflict with a belief shared with the partner are more difficult to handle than representations that do not involve such a conflict. In the case of comprehension of deceit, the observer recognizes the difference between the mental states that are expressed, and those that are privately entertained by the speaker. Consider for instance the following example: Mark and Ann share the opinion that the conference they have just attended was an absolute bore. Mark is annoyed with John because he did not come to the conference and he does not want to admit to himself that the whole morning has been a waste of time. After the conference Mark and Ann meet John who asks them:

[3] John: 'How was the conference?'

Mark: 'It was really interesting!'

Ann can understand that Mark is deceiving John because she recognizes the difference between the mental states he is expressing and those he truly

and privately entertains. In addition, a statement becomes ironic when, along with this difference, the partner also recognizes the contrast between the expressed mental states and the scenario provided by the knowledge the speaker shares with the partner. In our example Ann might also interpret [3] as an ironic remark addressed to her, because she shares with Mark the knowledge that the conference was not interesting at all. For an observer the simultaneous activation of the representation of the speaker's utterance (*It was really interesting*) and of the contrasting shared belief (*It was boring*) makes an ironic communication act more difficult to comprehend than a deceitful communication act. Consistent with the claims by Sullivan, Winner and Hopfield (1995), irony differs from deceit because the speaker takes as being shared with the partner a belief that contrasts with the ironic utterance, whereas in deceit, the speaker does not share her contrasting private belief. Thus, the same utterance can be considered at the same time an irony or a deceit: it depends on what the speaker shares with the partner. To sum up, non-standard communication is characterized by the need to detect conflicting representations: to comprehend deceit the individual must detect one conflict, and to comprehend irony he must detect two conflicts. As a consequence, the Cognitive Pragmatics theory predicts that i) standard phenomena are easier to deal with than non-standard phenomena and ii) deceits should be easier to deal with than ironies. Moreover, the literature on the development of human cognition reveals that the ability to detect conflicting representations is not fully developed in children, rather, it increases with age and correlates with the ability to reason (Bara, Bucciarelli & Johnson-Laird, 1995; Bara, Bucciarelli & Lombardo, 2001). The assumption of the Cognitive Pragmatics theory, along with the data in the developmental literature, leads to the prediction that, iii) the ability to comprehend communication acts involving conflicting mental representations increases with age. Bucciarelli et al. (2003) conducted an experiment on children aged 2;6 to 7 years which confirmed these three predictions. Also Bosco and Bucciarelli (2008) conducted an experiment on children aged 6;6 to 10 years that confirms the three predictions. An example of standard communication act used by Bosco and Bucciarelli is:

[4] *This evening Giorgio and his father are watching TV.*

Giorgio says: 'Daddy, can I watch a cartoon?'
His father replies: 'No, you have to go to bed'.

An example of deceit is:

[5] *Pietro and Lucia are playing in the playground. Mario comes along, he isn't a nice boy and he wants to play with them.*
Mario says: 'Are you playing?'
Pietro replays: 'We're not doing anything'.

An example of irony is:

[6] *Chiara has an end of school exam and is nervous. She meets Luca.*
Luca says: 'It's a really difficult exam'.
Chiara replies: 'That's very encouraging!'.

Bosco and Bucciarelli (2008) find the following trend of difficulty in comprehension of communicative meaning, from the easiest to the most difficult to comprehend: standard use, deceitful use, ironic use. The authors find the following trend of difficulty in children's comprehension of standard, deceitful and ironic communication acts they explain on the basis of the increasing complexity of the mental representations involved.

We follow the tenets of Cognitive Pragmatics and extend the theory to account for the case of intentional communication through figurative expressions whose communicative meaning is sincere, deceitful or ironic.

3. Comprehending the communicative intention of figurative expressions: A Cognitive Pragmatics perspective

The reconstruction of the literal meaning of a communication act through a parsing process is a factor that affects the cognitive effort experienced by the listener in comprehending a communication act (Dick, Wulfeck, Krupa-Kwiatkowski & Bates, 2004; Nippold, Hesketh, Duthie & Mansfield, 2005). However, given a certain non-figurative communication act (with a given syntactic complexity), what is predictive of the difficulty of comprehend-

ing that act, when proffered with different communicative intentions, is the complexity of the mental representations involved in the different communicative contexts. Since we confirmed the expected trend of difficulty in two former experiments (Bucciarelli et al., 2003; Bosco & Bucciarelli, 2008), in the present investigation we focus on figurative expressions. Following the same line of argumentation we assume that, like in literal language, also in figurative language the complexity of the mental representations involved is predictive of the difference in difficulty of comprehending an expression proffered with different communicative intentions. We keep the linguistic form of each figurative expression studied constant, and we make the expression occur in contexts where it acquires either a sincere, deceitful or ironic communicative meaning. Thus, our analysis transcends issues such as the complexity of the parsing process or the complexity of the process to reconstruct the figurative meaning.

Consider, for example, the figurative expression used in our experimental protocol *To be a genius* meaning to be excellent: depending on the speaker's private mental states and the knowledge he shares with the partner, it can acquire a sincere, deceitful or ironic communicative meaning. The following is an example of the figurative expression uttered with the intention of being sincere.

- [7a- Sincere] *Anna and Lucia are going to a concert. The pianist is famous because he is very good and plays well.*
Anna: 'Shall we enjoy it?'
Lucia: 'What do you think?'
Anna: 'The pianist is a genius.'

This is a case of standard communication: what the speaker means is in line with his/her private beliefs. Thus, the listener immediately refers the move to the behavior game [EXCHANGE-OF-OPINION] she shares with the partner. In terms of mental representations, the speaker's private beliefs and the beliefs expressed through the expression, are not in conflict (see Figure 1).

In contrast, in non-standard communication (i.e., deceit and irony), what the speaker means is in conflict with his/her private beliefs (see Figure 1).

	Does the speaker's communicative intention, expressed through the figurative expression...		
Communicative uses of a figurative expression	conflict with his private mental states?	contrast with the knowledge given as shared with the partner?	Number of conflicts
Sincere	No	No	0
Deceitful	Yes	No	1
Ironic	Yes	Yes	2

Figure 1. Conflicts involved in comprehending sincere, deceitful and ironic figurative expressions.

Consider the following example, where the figurative expression is now uttered with the intention of deceiving.

[7b- Deceitful] *Anna and Lucia are going to a concert. Anna knows the pianist plays very poorly but wants to go to the concert to see a boy she fancies.*

Anna: 'Shall we enjoy it?'

Lucia: 'What do you think?'

Anna: 'The pianist is a genius.'

In case of comprehension of deceit the listener recognizes that the mental states that are expressed and those the speaker privately entertains are conflicting. In our example the speaker proffers the figurative expression with a deceitful intent: in this case the speaker expresses a belief to the partner (the pianist is excellent), while she does not privately entertain such a belief.

An utterance becomes ironic when, along with this conflict, the partner also recognizes the conflict between the expressed mental states and the scenario provided by the knowledge the speaker shares with the listener. Consider the following example, where the figurative expression is now uttered with an ironic intent.

[7c- Ironic] *Anna and Lucia are going to a concert. The pianist is famous*

for his poor piano playing.

Anna: 'Shall we enjoy it?'

Lucia: 'What do you think?'

Anna: 'The pianist is a genius.'

By proffering the figurative expression the speaker intends to share her private belief (the pianist plays the piano poorly) with the listener. The simultaneous activation of the representation of the speaker's communicative meaning and of the conflicting shared belief makes an ironic figurative expression more difficult to comprehend than a deceitful one. To sum up, within our framework conventional figurative expressions uttered with the intention of being sincere can be considered standard communication acts, whereas conventional figurative expressions uttered with the intention of being either deceitful or ironic can be considered examples of non-standard communication acts. Thus we predict that:

1. There is a trend in difficulty of comprehension, from the simplest to the most difficult to comprehend: sincere use of the figurative expression, deceitful use of the figurative expression, ironic use of the figurative expression.

Further, the developmental literature reveals that the ability to comprehend the sincere use of figurative language (Levorato & Cacciari, 1989; Johnson, 1991) and the ability to detect conflicting representations increase with age and correlate with the ability to reason (Bara et al., 1995; Bara et al., 2001). Our assumptions, along with the data in the literature, lead us to predict that:

2. The ability to comprehend sincere, deceitful and ironic use of figurative expressions increases with age.

3.1. Experiment

Method

Material and procedure

The material consists of one hyperbole (*To be a genius*), one simile (*To*

be as mute as a fish), two (*opaque*) idioms (*To fall from the clouds*; *To be cold-blooded*) and two metaphors (*To be a fox*; *To have a broken heart*). We conducted a pre-test to ascertain that the 6 figurative expressions were conventional in the children's community. The participants in the pre-test were twenty children whose age ranged from 7 to 7; 6 years (mean age: 7; 4) attending two schools in Piedmont, Italy. We presented them with all the 6 figurative expressions one at a time and in random order. The experimenter read each figurative expression out loud and presented the relative written sheet to the child. If children said or demonstrated to have not understood or paid attention to the experimenter, the experimenter read the expression again. After each figurative expression, the experimenter asked the following questions:

- a) 'Have you ever heard [FIGURATIVE EXPRESSION]?'
- b) 'In what occasion have you heard [FIGURATIVE EXPRESSION]?'

If the response was not clear or if the children did not explain the meaning of the figurative expression, the experimenter asked:

- c) 'What's the meaning of [FIGURATIVE EXPRESSION]?'

If the response was still not clear, the experimenter asked:

- d) 'What could the person have said instead of [FIGURATIVE EXPRESSION]?'

The figurative expression was coded as familiar for the child if the child heard it before, provided that the child mentioned a plausible pragmatic context in which he/she heard the expression itself. In particular, for question a), if participants thought they had heard the figurative expression before their response scored "1", if they thought they had never heard the figurative expression before their response scored "0". Question b) aimed at measuring the accuracy in the interpretation of the figurative expressions: if participants understood the meaning of the expression (independently of the communicative use they assigned to the expression), their response

scored “1”, otherwise it scored “0”. Questions c) and d) were devised to make clearer possible obscure answers to question b). Each figurative expression received a mean score for familiarity of 0.56 (SD=0.2). As for accuracy, each figurative expression received a mean score for correct interpretations of 0.68 (SD=0.2). A correlation analysis revealed that children’s performance with the figurative expressions correlated with their estimation of familiarity of the figurative expression (Pearson’s correlation: $r=.714$ $p<.001$). Since the results of our pre-test revealed that the figurative expressions were familiar to children, we used them for the main test.

In the experiment the material consisted of brief audio-recorded stories that were presented one at a time, along with the written version, in order to minimize the role of working memory. Each story involved a figurative expression, and for each one we created three different communicative contexts, within which the figurative expression acquired either a sincere, deceitful or ironic communicative meaning. The 6 figurative expressions combined with the three contexts gave rise to 18 trials. We devised three different experimental protocols where each figurative expression appeared only once, with one of the three communicative meanings. In each protocol there were 2 standard figurative expressions, 2 deceitful figurative expressions, and 2 ironic figurative expressions. The experimental material is in the Appendix. Further, as the literature points out that the speaker’s intonation of an utterance might facilitate the comprehension of his or her communicative intention (Andrews, et al. 1986; Capelli, Nakagara & Madden, 1990; Grice, 1975; Laval & Bert-Erboul, 2005), we kept this variable under control by audio-recording the stories as they were read by a person unknown by the child, without emphasis (for example due to varying intonation). For the experiment, the two experimenters frequented the schools in order to familiarize with the children. The children were tested individually in a quiet room of the school. They were allowed to listen to and read the stories as many times as they wished. For each figurative expression the children were asked three questions:

- a) ‘Why does the speaker say to the partner: [FIGURATIVE EXPRESSION]?’

If the child merely repeated the figurative expression or the response was

not clear, the experimenter asked a second question:

b) 'How else could he/she have said it?'

If the response was still not clear, the experimenter asked a third question:

c) 'What else could he/she say instead of: [FIGURATIVE EXPRESSION]?'

The experiment lasted 30 minutes. Each experimental session was audio-recorded and, subsequently, two independent judges evaluated the children's responses: a score of 1 was awarded for plausible interpretations and a score of 0 for not plausible interpretations. The two judges had a priori criteria to discriminate between plausible and not plausible interpretations: for example, in the case of sincere figurative expressions (e.g., consider [7a] *The pianist is a genius*), interpretations revealing that the child had correctly understood that the communicative intention expressed by the speaker was in line with both his private mental states and the knowledge given as shared with the partner, were coded as plausible (e.g., *The pianist plays the piano well; The pianist plays so well that we can say he is a genius*). Other interpretations (e.g., *The pianist can't play at the concert; The pianist plays very poorly*) were considered as not plausible. In the case of deceitful figurative expressions (e.g., consider [7b] *The pianist is a genius*) interpretations revealing that the child had correctly understood that the communicative intention expressed by the speaker was not in line with his private mental states, but was in line with the knowledge given as shared with the partner, were coded as plausible (e.g., *Anna says that the pianist plays the piano well because she is afraid her friend won't come to the concert; Ann invented a reason for going to the concert*). Other interpretations (e.g., *The pianist plays well; That pianist is the best*) were considered as not plausible. In the case of ironic figurative expressions (e.g., consider [7c] *The pianist is a genius*), interpretations revealing that the child had correctly understood that the communicative intention expressed by the speaker was not in line with his private mental states and contrasted with the knowledge the speaker shared with the listener, were coded as plausible (e.g., *Anna is joking, they know the pianist plays poorly; Anna means that the pianist is*

not a genius, rather, he plays badly); other interpretations (e.g., *The pianist is nervous about the concert*; *The pianist is good*) were coded as not plausible. The two judges coded the participants' responses individually; the judges reached a significant level of agreement on their first judgments for the overall group of participants and overall responses (Cohen's $K = 0.814$, $p < .0001$). For the final score the judges discussed each item on which they disagreed, until reaching a full agreement.

Participants

The participants in the experiment were 108 children, with 36 children balanced by gender in each of the following age groups: 7-7;6 (mean age: 7;3), 8;6-9 (mean age: 8;7), and 10-10;6 (mean age: 10;2). The participants were randomly selected from among middle-class pupils attending four different junior schools in Piedmont, Italy. All of the children were Italian native speakers and none of them were bi-lingual or had declared behavioral or learning problems. The age of the youngest group of children was selected on the basis of their supposed established reading ability (they all attended the second year of school). The age of the oldest group of children was established on the basis of the fact that the ability to deal with ironic communication acts is not yet at ceiling effect at 10 years of age (Lucariello & Mindolovich, 1995; Dews, Winner, Kaplan, Rosenblatt, Hunt, Lim, McGovern, Qualter & Smarsh, 1996).

Results

Considering the overall group of children, standard use of figurative expressions is easier to comprehend than deceitful use, which is in turn easier to comprehend than ironic use (Page's L test: $L = 493$ $p < .005$). Table 1 illustrates the mean percentages of plausible interpretations for the three different uses of figurative expressions. The same result holds if we consider the single age groups separately (Page-s L test: L value ranging from 163 to 166 p value always $< .001$). A detailed analysis reveals that standard use of figurative expressions is easier to comprehend than deceitful use, overall and in the single age groups (Wilcoxon test: tied z value ranging from 2.96 to 5.15, tied p value ranging from $< .001$ to $< .003$). Moreover, standard use of figurative expressions is easier to comprehend than ironic use, overall and in the single age groups (Wilcoxon test: tied z value ranging from 3.11 to 5.29, tied p value ranging from $< .001$ to $< .002$). As regards

Table 1. Means and standard deviations for plausible interpretations of standard, deceitful and ironic use of figurative expressions.

	Standard (n=2)		Deceitful (n=2)		Ironic (n=2)		Global (n=6)	
	M	SD	M	SD	M	SD	M	SD
7-7;6 (N=36)	.52	.18	.04	0.08	.01	.05	.21	.08
8;6-9 (N=36)	.69	.19	.15	0.13	.08	.11	.31	.11
10-10;6 (N=36)	.82	.15	.35	0.22	.13	.13	.43	.12
Global (N=108)	.70	.19	.18	0.21	.07	.02	.32	.14

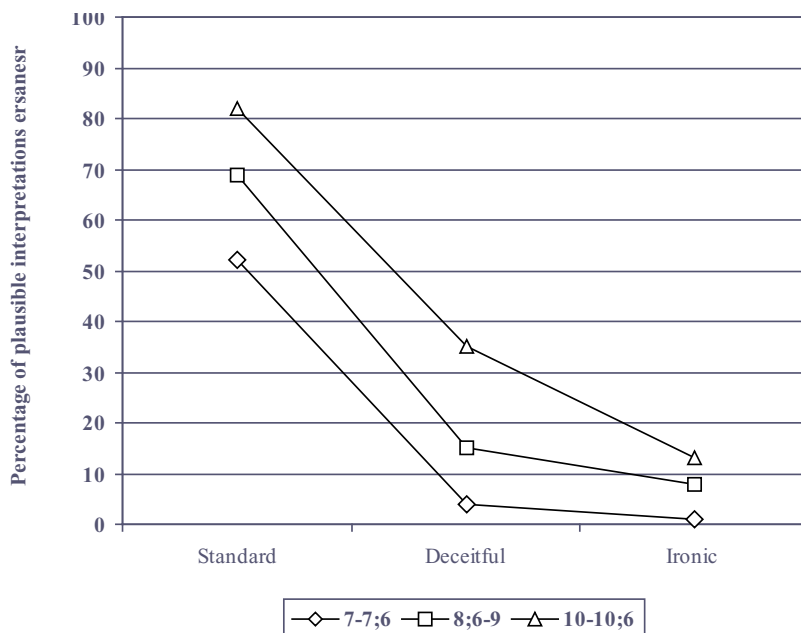


Figure 2. Histogram of the percentages of plausible interpretations of standard, deceitful and ironic figurative expressions.

Table 2. Means and standard deviations for plausible interpretations of standard, deceitful and ironic use of the four sorts of figurative expressions and over all the 108 children.

Sorts of figurative expressions	Standard		Deceitful		Ironic		Global	
	M	SD	M	SD	M	SD	M	SD
Simile (n=1)	.72	.45	.31	.47	.03	.17	.35	.24
Metaphor (n=2)	.76	.30	.14	.26	.06	.16	.32	.17
Idiom (n=2)	.47	.36	.04	.14	.06	.16	.19	.16
Hyperbole (n=1)	1.00	.00	.42	.50	.19	.40	.54	.24

a detailed comparison between the deceitful and ironic use of figurative expressions, the results reveal that deceitful use is easier to comprehend than ironic use when considering the overall group of participants (Wilcoxon test: tied $z = 3.5$, tied p value $< .001$). The same result holds for the oldest group of participants, namely for 10-year-olds (Wilcoxon test: tied $z = 2.7$, tied $p < .007$), but not for 7-year-olds (Wilcoxon test: tied $z = 1.13$, tied $p < .26$) and 8-year-olds (Wilcoxon test: tied $z = 1.89$, tied $p < .06$).

Our second prediction was also confirmed: the ability to comprehend standard (Jonckheere's test: $z = 3.22$, $p < .001$), deceitful (Jonckheere's test: $z = 3.75$, $p < .001$) and ironic (Jonckheere's test: $z = 2.57$, $p < .01$) figurative expressions increases with age (see Figure 2).

According to our proposal the complexity of the mental representations is predictive of the difference in difficulty of comprehending a conventional figurative expression proffered with different communicative intentions. Therefore we also expect our predictions to hold within each category of figurative expression considered separately. Table 2 illustrates the mean percentages of plausible interpretations for the different sorts of figurative expressions when used with different communicative intentions. As each participant dealt with only one or two figurative expressions of the same sort, our prediction was tested for the overall group of participants.

As regards the trend in difficulty for comprehending the very same expression when proffered with different communicative intentions, we expected to find that standard use is easier than deceitful use, which is in turn easier than ironic use. A series of Page's L tests reveals that this prediction holds for similes ($L = 466.5$, $p < .005$), for metaphors ($L = 484.5$, $p < .005$), for idioms ($L=493$, $p<.005$), for hyperboles ($L = 474.5$, $p < .005$). Moreover, if we compare standard use with deceitful use in each category of figurative expressions, the results reveal that standard use is easier than deceitful use (Wilcoxon test: tied z value varies from 2.9 to 4.9, tied p value is always $< .001$). The results are less compelling for the comparison between deceitful use and ironic use: the prediction is fully confirmed for similes and hyperboles in that their deceitful use is easier than their ironic use (Wilcoxon test: tied z value is 2.9 and 2.3, p value is $< .004$ and $< .02$, respectively). As regards metaphors, the comparison between deceitful and ironic use only reveals a marginally significant difference in difficulty, in the direction we predicted (Wilcoxon test: tied $z = 1.9$, tied $p < .058$). As regards idioms, deceitful use is as difficult to comprehend as ironic use (Wilcoxon test: tied $z = .6$, tied $p < .56$). Further, our prediction that the ability to comprehend the different sorts of figurative expressions increases with age is also confirmed (Jonckheere test: z value varies from 2.6 to 3.2, p value varies from $< .001$ to $< .009$).

4. Discussion and conclusions

In the present investigation we focused on the cognitive processes that contribute to explain the difference of difficulty in comprehending the same conventional figurative expression uttered with different communicative intentions. Our global results confirm the expected trend in difficulty, both over all children and considering separately each age group: comprehending sincere figurative expressions is easier than comprehending deceitful one, which is in turn easier than comprehending ironic figurative expressions. An unexpected result is that 7- and 8-year-olds found deceitful expressions as difficult to comprehend as ironic expressions. A possible explanation is a "floor" effect: deceitful and ironic figurative expressions are too difficult to comprehend and children start to perform above a chance level only after 8

years of age. Our tentative explanation is consistent with Levorato and Cacciari (1995) who argue that figurative language processing changes dramatically at around 8 years of age.

To the best of our knowledge none of the studies in the literature simultaneously investigate the ability to reconstruct the communicative meaning of the same figurative expression when proffered in different communicative contexts. However a comparison is made in the literature between sincere and ironic figurative expressions. For example Katz and Pexman (1997) study the interpretation of statements like *Children are precious gems*, in which the speaker could proffer the metaphor either with the intention of being sincere or sarcastic-ironic. The authors found that the same statements, which in neutral contexts are interpreted as sincere metaphors, are taken to be ironic when proffered by members of certain occupations that are thought to involve considerable use of irony, i.e. comedian or cab driver. Further, the shared knowledge about the speaker's occupation helps to resolve the speaker's intent for equivalent statements. Our theoretical perspective is in line with such data on adults, since in our view a crucial point in irony comprehension are the beliefs shared by the participants in the communicative interaction.

Our developmental prediction is also confirmed: children's ability to comprehend sincere, deceitful and ironic figurative expressions increases with age. The results also confirm the prediction if we consider each single category of figurative expressions. Our results are in line with Levorato and Cacciari (1989), who find that from 7 years of age onward children are able to perceive idiomatic expressions in an informative context and with Kaplan, Winner and Roseblatt (1993) who point out that starting from the same age children understand sincere metaphors. Our results are also consistent with Johnson (1991), who finds that children's ability to interpret sincere metaphors significantly increases from 7 to 12 years of age. The acquisition of figurative competence is a long-lasting process that starts with 4-5-year-olds interpreting idioms literally. Progressively, in the course of development, the literal interpretation is suppressed and more mature forms of elaboration, namely figurative, become manifest (Ackerman, 1992; Levorato & Cacciari, 1992, 1995; Nippold & Taylor, 1995, 2002; Nippold & Rudzinski, 1993).

We investigated different kinds of figurative expressions: metaphors, hyperbole, similes and idioms. Our assumption is that the same cognitive factor, namely the complexity of the mental representations involved in comprehending their communicative meaning, accounts for their relative difficulty of comprehension when proffered with either sincere, deceitful or communicative intentions. Apart those studies in the literature that investigate only a particular sort of figurative expression, some studies are grounded on the theoretical distinctions between the cognitive factors involved in comprehending the different kinds of figurative expressions (Johnson, 1996; Chiappe, Kennedy & Smykowski, 2003; Harris, Friel & Mickelson, 2006). We admit the possibility that the different kinds of figurative expressions, when used with the same communicative intentions, vary in difficulty of comprehension. However our assumption is concerned with the case in which we consider the very same figurative expression, independently on the fact that, for example, it is a simile or a metaphor, but proffered with different communicative intentions. Our prediction is confirmed for both similes, metaphors, idioms and hyperboles. These results suggest that, although the different kinds of figurative expressions might vary in terms of levels of abstractness (Keil, 1986), our assumptions on the complexity of the mental representations involved in comprehending their communicative use still hold. The only exception are idioms, whose deceitful use results as difficult to comprehend as their ironic use. A post-hoc explanation is that idioms are especially difficult to comprehend even for 10 year olds: such a difficulty of comprehension increases exponentially in case their communicative use is either deceitful or ironic.

One could propose an alternative theoretical reason, with respect to ours, to explain the difference in difficulty between sincere figurative expressions and ironic figurative expressions, namely that ironic figurative communication acts, but not sincere figurative communication acts, require a second-order inference about the speaker's thought. Indeed, Colston and Gibbs (2002) found that the very same statement., e.g. *This one's really sharp*, proffered in a context having an ironic (but not metaphorical) meaning, takes longer to be understood than in a context in which it has a sincere metaphorical meaning. In line with Sperber (1996) and Winner and Gardner (1993), Colston and Gibbs (2002) explain such a result arguing that irony

specifically requires the listener to draw a second-order inference about the speaker's thought, whereas metaphor comprehension does not need such a complex meta-representational inference. Winner (1988) and Winner and Gardner (1993) argue that interpreting a (sincere) metaphor only requires a meta-linguistic awareness, namely the knowledge of the domain involved is sufficient in order to comprehend the (sincere) metaphor. In contrast the comprehension of irony requires the listener to have beliefs about beliefs, that is a second-order theory of mind. According to the authors, as children's second-order inferential ability develops later than their domain knowledge, they understand irony after (sincere) metaphors. Along the same lines, one could argue that ironic figurative expressions are harder to comprehend than deceitful figurative expressions because they involve a second-order mental representation and not just a first-order mental representation like deceits (for a similar proposal regarding comprehension of irony vs. deceit see Winner & Leekman, 1991). In particular, Sullivan et al. (1995) found that from 7 years of age, children can distinguish lies from jokes, and they attribute this ability to the acquired ability to attribute second-order mental states. In our view, our results cannot be explained merely in terms of the role played by the second-order theory of mind in both irony and deceit comprehension. Indeed, as the literature reveals that children from 8 years of age onward are quite expert in inferring second-order mental states (Perner & Winner, 1985), we can not impute the difference in performance of our 10-year-olds with sincere, deceitful and ironic figurative expressions just to a difficulty in dealing with second-order beliefs. Though not wishing to deny the role played by the theory of mind in comprehending our task, our data do suggest that the capacity to deal with second-order mental representations (ToM) cannot be the only factor accounting for the difference of difficulty in comprehending sincere, deceitful and ironic figurative expressions. Rather, our results are consistent with our assumption according to which comprehending figurative expressions proffered with the intention of being deceitful or ironic involves the detection of conflicting representations, and such detection is cognitively effortful.

Taken globally, our results and those of previous studies (see Bucciarelli et al. 2003; Bosco & Bucciarelli, 2008) support the theoretical framework advanced by Cognitive Pragmatic theory, and suggest the possibility of

conceiving a unifying theoretical framework to explain the emergence of the ability to comprehend both non-figurative communication acts and figurative expressions. Our proposal is compatible with the more advanced assumptions derived from Relevance theory (see, e.g., Sperber & Wilson, 1986/1995). Wilson and Carston (2006), for example, suggest that the interpretation of metaphorical utterances results in the attribution of emergent properties, and they argue that the derivation of such emergent properties involves no specific interpretative mechanisms not required for the interpretation of literal utterances. However, within the theoretical framework of the Relevance theory nobody has proposed or empirically investigated the mental representations and processes that account for the differences in difficulty of comprehending the very same figurative expression when uttered with different communicative intentions, nor the very same non-figurative expression when uttered with different communicative intentions.

Our results suggest that, in line with the theoretical framework we proposed, the same cognitive processes, namely the complexity of the mental representations, can explain the difference of difficulty in comprehending the communicative meaning of a figurative expression, as well as the difference of difficulty in comprehending the communicative meaning of non-figurative expressions such as directs, deceptions and communicative failures, in both normal development (Bosco et al., 2006; Bucciarelli et al., 2003), abnormal development (Bara, Bosco & Bucciarelli, 1999; Bara, Bucciarelli & Colle, 2001) and atypical development (De Marco, Colle & Bucciarelli, 2007). In conclusion, our approach appears to be a good candidate as a unified theoretical perspective for explaining the cognitive process underlying the communicative use of both figurative and non-figurative language.

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Appendix. The familiar metaphors used in the experiment

To be as mute as a fish *TO BE SILENT, AND KEEP SECRETS*

[Essere muti come un pesce]

Sincere

Marta's father tells her a secret. Father goes out. Mother comes in.

Mother: Marta, what did your father say to you?

Marta: I can't tell you.

Marta goes out and her father comes in.

Mother: Marta is as mute as a fish.

Deceitful

Marta's father tells her a secret. Father goes out. Mother comes in.

Mother: Marta, what did your father say to you?

Marta tells her mother everything. Marta goes out and her father comes in.

Mother: Marta is as mute as a fish.

Ironic

Marta's father tells her a secret. Father goes out. Mother comes in.

Mother: Marta, what did your father say to you?

Meanwhile, mother has seen that father is next to the door and that he is listening. Father and mother look at each other while Marta tells her mother everything. Marta goes out and her father comes in.

Mother: Marta is as mute as a fish.

To have a broken heart *TO BE SAD ABOUT LOVE*

[Avere il cuore spezzato]

Sincere

Carla leaves her fiancé Luigi. One day Carla meets one of Luigi's friends.

Friend: How are you?

Carla: Fine thanks. How's Luigi?

Friend: Luigi has a broken heart.

Deceitful

Carla leaves her fiancé Luigi. One day Carla meets one of Luigi's friends.

The friend knows that Luigi is happily engaged to a friend of theirs.

Friend: How are you?

Carla: Fine thanks. How's Luigi?

Friend: Luigi has a broken heart.

Ironic

Carla leaves her fiancé Luigi. One day Carla meets one of Luigi's friends. Carla and the friend know that Luigi is happily engaged to a friend of theirs.

Friend: How are you?

Carla: Fine thanks. How's Luigi?

Friend: Luigi has a broken heart.

To be a fox

TO BE CUNNING

[Essere una volpe]

Sincere

Carlo and Andrea must choose the teams to play cops and robbers. Carlo knows that Mario never lets himself get caught.

Carlo: Andrea, it's your turn to choose, who do you want in your team?

Andrea: I don't know who to choose.

Carlo: Mario is a fox.

Deceitful

Carlo and Andrea must choose the teams to play cops and robbers. Carlo knows that Mario always lets himself get caught.

Carlo: Andrea, it's your turn to choose, who do you want in your team?

Andrea: I don't know who to choose.

Carlo: Mario is a fox.

Ironic

Carlo and Andrea must choose the teams to play cops and robbers. Their friend Mario has always let himself get caught each time they have played the game.

Carlo: Andrea, it's your turn to choose, who do you want in your team?

Andrea: I don't know who to choose.

Carlo: Mario is a fox.

To fall from the clouds

TO BE DUMBFOUNDED

[Cadere dalle nuvole]

Sincere

Gigi is at school and the teacher tells the children their marks for their work. Gigi thinks he has got a very good mark.

Gigi: What did I get Miss?

Teacher: You got a low mark.

Gigi: I've fallen from the clouds.

Deceitful

Gigi is at school and the teacher tells the children their marks for their work. Gigi has spied his mark and seen that he got a low mark.

Gigi: What did I get Miss?

Teacher: You got a low mark.

Gigi: I've fallen from the clouds.

Ironic

Gigi is at school and the teacher tells the children their marks for their work. Gigi always gets low marks.

Gigi: What did I get Miss?

Teacher: You got a low mark.

Gigi: I've fallen from the clouds.

To be cold-blooded

*NOT TO LOSE ONE'S TEMPER, TO BE
DETACHED*

[Avere il sangue freddo]

Sincere

Carlo falls over on the way to a friend's house and cuts his hand. He goes home and his father dresses the wound. Then Carlo goes to his friend's house. His mother phones home from work.

Father: Hi, Carlo fell over on the way to a friend's house and hurt himself.

Mother: How is he now?

Father: Carlo is cold-blooded.

Deceitful

Carlo falls over on the way to a friend's house and cuts his hand. He goes home and his father dresses the wound. Then Carlo goes to his room, gets into bed and starts crying.

His mother, who always fusses too much about Carlo's health, phones home from work.

Father: Hi, Carlo fell over on the way to a friend's house and hurt himself.

Mother: How is he now?

Father: Carlo is cold blooded.

Ironic

Carlo falls over on the way to a friend's house and cuts his hand. He goes home and his father dresses the wound. Then Carlo goes to his room and gets into bed.

His mother, who is always concerned about Carlo's health, phones home from work.

Father: hi, Carlo fell over on the way to a friend's house and hurt himself.

Mother: How is he now?

Father: Carlo is cold blooded.

To be a genius

*TO BE EXTRAORDINARILY INTELLIGENT,
CLEVER*

[Essere un genio]

Sincere

Anna and Lucia are going to a concert. The pianist is famous because he is very good and plays well.

Anna: Will we enjoy it?

Lucia: What do you think?

Anna: The pianist is a genius.

Deceitful

Anna and Lucia are going to a concert. Anna knows the pianist plays very poorly but wants to go to the concert to see a boy she fancies.

Anna: Will we enjoy it?

Lucia: What do you think?

Anna: The pianist is a genius.

Ironic

Anna and Lucia are going to a concert. The pianist is famous for his poor piano playing.

Anna: Will we enjoy it?

Lucia: What do you think?

Anna: The pianist is a genius.

Below is an example of the experimental material in the Italian original.

Essere una volpe

TO BE CUNNING

[To be a fox]

Carlo: Andrea, tocca a te scegliere, chi vuoi nella tua

[Carlo: Andrea, it's your turn to choose, who do you want in your squadra? team?]

Andrea: non so chi scegliere.

[Andrea: I don't know who to choose]

Carlo: Mario è una volpe

[Carlo: Mario is a fox]

Context for sincere

Carlo e Andrea devono formare le squadre per giocare [*Carlo and Andrea must choose the teams to play a guardie e ladri. Carlo sa che Mario non si fa mai prendere cops and robbers. Carlo knows that Mario never lets himself get caught*]

Context for deceitful

Carlo e Andrea devono formare le squadre per giocare [*Carlo and Andrea must choose the teams to play a guardie e ladri. Carlo sa che Mario si fa sempre prendere cops and robbers. Carlo knows that Mario always lets himself get caught*]

Context for ironic

Carlo e Andrea devono formare le squadre per giocare

[*Carlo and Andrea must choose the teams to play a a guardie e ladri. Tutte le volte che hanno giocato l'amico Mario cops and robbers. Their friend Mario si è sempre fatto prendere. has always let himself get caught each time they have played.*]

