

Simple and complex deceptions and ironies

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Abstract

In the classical philosophy of language a distinction is made between direct and indirect speech acts. In the present paper we propose that a new distinction, between simple and complex communicative acts, can include any kind of pragmatic phenomena, including deceit and irony. In particular, we assume that a complex act, with respect to a simple act of the same sort, e.g., irony, requires a complex inferential chain in order to grasp the communicative intention of the speaker. Therefore, we predict that complex acts are more difficult to comprehend than simple acts. Furthermore, we assume that simple acts of different sorts, e.g., deceit and irony, involve mental representations of different degrees of complexity. Therefore, we predict that simple standard acts are easier than simple deceptions, which are in turn easier than simple ironies. Overall our predictions are confirmed by the results of an experiment carried out on 96 children aged 6;6–10 years. Some unexpected results are also interpretable within the proposed framework.

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1. Introduction

In the classical philosophy of language, a distinction is drawn between direct and indirect speech acts. Searle (1975) claims that to comprehend an indirect speech act means to realize that an illocutionary act is (indirectly) being performed via the execution of a different, literal illocutionary act. On the other hand, a direct speech act occurs when a speaker utters a sentence that communicates exactly and literally what she intends to say, as in:

[1] What time is it?

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Through indirect speech acts the speaker communicates to the listener more than what she is actually saying, by relying on their background of mutually shared information and on the listener's general powers of rationality and inference. Examples of indirect speech acts are:

- [2]
- a. Can you please tell me what time it is?
 - b. Would you mind telling me what time it is?
 - c. I wonder if you'd be so kind as to tell me what time it is.
 - d. I don't have my watch.

Searle claims that understanding [1] is straightforward, while understanding [2] relies on some kind of common knowledge. Moreover, the length of the inferential path is not the same for each utterance in [2]. For example, [2d] requires a greater number of inferences than does [2a]. Searle claims that the primary illocutionary force of an indirect speech act is derived from the literal speech act via a series of inferential steps. The listener's inferential process is triggered by the assumption that the speaker is following the Cooperative Principle (Grice, 1978), together with the evidence of an inconsistency between the utterance and the context of pronunciation. The listener first tries to interpret the utterance literally and only after the failure of this attempt, due to the irrelevance of the literal meaning, does he/she look for a different meaning, which conveys the primary illocutionary force. According to the classical theory, an indirect speech act is intrinsically more difficult to comprehend than a direct speech act.

Some authors have criticized this position (see Clark, 1979; Recanati, 1995; Sperber and Wilson, 1986/1995). Indeed, Gibbs (1994) points out that indirect speech acts are not a homogeneous category. In particular, he states that indirect speech acts with conventional meanings are easier to understand than indirect speech acts with non-conventional meanings; the context specifies the need to use a conventional indirect act and thus helps the listener to understand the intended meaning more quickly. Gibbs (1986a) claims that a speaker can use an indirect act when he/she thinks there might be obstacles preventing the formulation of the intended request: for example, when the speaker does not know whether the listener owns a hypothetically desired object, he/she can use a conventional indirect request. Gibbs suggests that the listener infers the meaning of a conventional indirect speech act via a habitual shortcut that facilitates its comprehension.

Developmental pragmatics can be taken into account in order to try to falsify the above-mentioned theories. Indeed, predictions concerning children's erroneous performance can be considered as evidence in favor of one of the competing theories. Within the perspective offered by developmental cognitive science, we can only fully understand how the mind works by taking into consideration not only the adult steady state, but also the development from childhood, through adolescence, to mental maturation (Karmiloff-Smith, 1992; Bara, 1995). Within such a perspective, if Searle is correct, indirect speech acts should always be more difficult to deal with than direct speech acts. If Gibbs is correct, nonconventional indirect speech acts should be more difficult to comprehend than conventional indirect speech acts, which in turn should be equivalent to direct speech acts in this respect. The developmental evidence is in favor of Gibbs' proposal. According to Reeder (1980), children aged 2;6–3 understand that, in an adequate context, utterances like 'I want you to do that' or 'Would you mind doing that?' have the same illocutionary force (see also Bernicot and Legros, 1987). Bara and Bucciarelli (1998) show that 2;6–3-year-olds find direct speech acts, like 'Please close the door', and conventional indirect speech acts, such as 'Would you like to sit down?' easy to understand. By contrast, they have difficulty with non-conventional indirect speech acts, for example in understanding that the

answer ‘It’s raining’ to the proposal ‘Let’s go out and play’ corresponds to a refusal. Finally, Bucciarelli et al. (2003) point out that children aged 2;6–7 years find direct speech acts (e.g., ‘Please take a seat’) and conventional indirect speech acts (e.g., ‘Could you open the door?’) easier to understand than non-conventional indirect speech acts (e.g., ‘Excuse me, I’m studying’ meaning ‘Please, do not make any noise’). In conclusion, the experimental evidence is against Searle’s distinction between direct and indirect speech acts and in favor of the shift of perspective we propose.

The experimental evidence concerning direct, conventional indirect and nonconventional indirect speech acts can be explained within the theoretical framework advanced by Cognitive Pragmatics theory (Airenti et al., 1993a, 1993b), which is more encompassing than the theoretical explanation advanced by Gibbs. Within the Cognitive Pragmatics framework, Bara et al. (1999a) argue that the distinction between direct and indirect speech acts can be abandoned in favor of the distinction between simple and complex communication acts; direct and conventional indirect speech acts are simple acts, whereas non-conventional indirect speech acts are complex acts. Further, they extend the distinction to deceptions and ironies. More generally, from these assumptions (detailed in section 2, below) the authors derive the prediction that simple acts are easier to comprehend than complex acts, both when considering standard acts, or non-standard acts such as deceptions and ironies. As far as standard acts are concerned, the prediction is experimentally validated by Bucciarelli et al. (2003) and De Marco et al. (2007) in their study on children dealing with communication acts using either linguistic or extralinguistic means; even 2;6-year-olds comprehend conventional indirect speech acts as well as direct speech acts, whereas they find it more difficult to comprehend complex standard acts than simple standard acts. The prediction that simple acts are also easier to comprehend than complex acts within non-standard communication is confirmed by Bosco et al. (2004) in a study on children aged 5;6–8;6 years dealing with communication acts using extralinguistic means. In particular, Bosco and colleagues find that simple deceptions are easier than complex deceptions, and simple ironies are easier than complex ironies.

The aim of this study is two-fold. First, we validate the prediction of Cognitive Pragmatics theory that simple linguistic communication acts are easier to comprehend than complex linguistic communication acts of the non-standard sort: namely deception and irony. In addition, we expect to find that simple standard acts are easier to comprehend than simple deceptions, which in turn are easier to comprehend than simple ironies.

In order to falsify our hypotheses we adopt a cognitive developmental perspective. The developmental domain is particularly relevant to this aim because it is possible to observe errors in the comprehension of different kinds of pragmatic tasks, which allows us to falsify our hypotheses on the complexity of the mental processes involved in specific phenomena. Adult subjects possess a fully developed cognitive system and communicative competence, and thus do not make any interesting errors in comprehending or producing different kinds of communication acts: the only thing a researcher can do in the case of adult subjects is to interpret their response time in solving pragmatic tasks (Bosco, 2006).

In the next section we introduce the theory of Cognitive Pragmatics and the assumptions from which we derive our predictions, and we justify the reasons for abandoning the traditional distinction between direct and indirect speech acts in order to adopt the proposed distinction.

2. Cognitive Pragmatics

Cognitive Pragmatics (Airenti et al., 1993a, 1993b) is a computational theory of the cognitive processes underlying human communication. This theory distinguishes among different kinds of

communication acts, and explains and predicts the degree of difficulty involved in their comprehension in both normal development (Bucciarelli et al., 2003; Bosco et al., 2006), abnormal development (Bara et al., 1999b; Bara et al., 2001a), and development under atypical conditions, such as deafness (De Marco et al., 2007). Moreover, the theory offers a plausible account of the decay of pragmatic competence in brain-damaged patients (Bara et al., 1997; Bara et al., 2001c; Cutica et al., 2003; Cutica et al., 2006).

A major assumption of the theory is that intentional communication requires behavioral cooperation between two people; this means that when two people communicate, they are acting on the basis of a plan that is at least partially shared. Airenti et al. (1984) call this plan a behavior game. A behavior game is a stereotyped pattern of interaction between the participants in the dialogue. Consider, for example, the communicative exchange:

- [3] Ann: 'Could you please lend me Eco's latest book?'
Ben: 'Sorry, I haven't finished reading it yet.'

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:

- [4] [LEND-OBJECT]:

- x gives the object to y;
- y returns the object to x.

Behavior games have a fundamental role in communication: the meaning of any communication act can only be fully understood when the game the move belongs to has been clearly identified. Thus, the expressive meaning of an utterance is necessary, but not sufficient to reconstruct the meaning conveyed by the actor (see also Gibbs, 1994; Recanati, 1995).

A behavior game can only be played when two people share knowledge of it. In particular, communication requires a specific mental state called shared belief. A shared belief refers to what an individual believes is shared with another, but which is not necessarily shared by the other. This is the main difference with respect to common belief, i.e., the space of belief that individuals really do have in common. 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 (1992) 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 the social, cultural and private affinities shared by two or more persons (Clark, 1992).

However, having common beliefs is not a sufficient condition for enabling communication to take place. Indeed, in order to communicate an agent must also believe that all of the other participants possess those very same common beliefs (Bara, 2007). The concept of shared belief, as expressed by Airenti et al. (1993a), denotes a belief that each participant believes to be shared by all the other participants. Thus, the shared belief has a crucial feature: it is subjective, and not objective (in contrast, for example, to the concept of common knowledge, as introduced by Lewis, 1969, or the concept of mutual knowledge introduced by Schiffer, 1972). Shared belief

always expresses the standpoint of one of the interlocutors: no agent can ever be sure that all the other participants share the same beliefs. In our model, all the inferences involved in comprehending a communication act are drawn in the space of the actor's shared belief. Thus, Cognitive Pragmatics utilizes a subjective, singlesided view of common belief assuming that each person has shared belief spaces containing all the beliefs the actor believes to be shared with one or more specific partners, with a group of people, or with all human beings. The beliefs that the partner thinks he/she shares with the actor have to do with the behavior game in play as well as with contextual information, such as the status of the participants in the dialogue, the spatial location of an object mentioned by the actor, and so on (see Bosco et al., 2003, 2004). This information guides the partner in reconstructing the actor's communicative intention.

Our crucial assumption is that comprehending the communicative meaning of any kind of utterance depends on the comprehension of the behavioral game bid by the actor; each participant in a dialogue interprets the communication acts of the interlocutors on the ground he/she assumes to be shared between them. In a developmental perspective, until the knowledge of a certain behavioral game is acquired (or is sufficiently strengthened), the communicative meaning of the utterance that makes reference to it cannot be understood (Airenti, 1998).

Within the theoretical framework offered by the theory of Cognitive Pragmatics, Bara et al. (1999a) propose to abandon the distinction between direct and indirect speech acts and adopt the distinction between simple and complex communication acts. Direct and conventional indirect speech acts are called simple communication acts; they immediately make reference to a behavioral game (and are therefore easy to comprehend). Nonconventional indirect speech acts are called complex communication acts; they do not make direct reference to a behavioral game and require a more complex inferential process (and are therefore more difficult to comprehend). For example, let us consider the example in [1]. The partner is immediately able to identify the game [GIVE-INFORMATION] in that the communication act consists of a move of that game. By contrast, in order to understand [2d], the partner has to go through a complex inferential chain and consider, for instance, that if the actor has not got a watch, she cannot know what time it is, and that a way of finding out the time is to ask somebody who has a watch. Only then can the partner attribute the value of a move of the game [GIVE-INFORMATION] to the utterance. Thus, if the problem is the identification of the game bid by the actor, the distinction between direct and indirect speech acts is non-existent. It is the complexity of the inferential steps necessary in order to refer the utterance to the game bid by the actor that accounts for the difficulty in comprehending the communication act. Consider the following examples from our experiment:

- [5] Manuela is in the classroom and is drawing with her classmates. Manuela says to the teacher. 'Miss, I've made a mistake in my drawing'. The teacher replies:
- (a) Simple: 'Rub it out then'
 - (b) Complex: 'Have you got an eraser?'

The act in (a) makes direct reference to the game [ASK-FOR-SUGGESTION] and can therefore immediately be interpreted as a suggestion, whereas in order to comprehend that the act in (b) is a suggestion to rub the mistake out, Manuela has to infer that erasers have this function. Thus, a longer inferential chain must be built to discriminate between complex and simple communication acts.

Bara et al. (1999a) also extend the distinction between simple and complex communication acts to deceit and irony. The inferential process that characterizes complex communication acts with respect to simple communication acts, whether standard, ironic or deceptive, is triggered by

the violation of expectations by the partner (Bucciarelli et al., 2003). A communication act by an actor that is inconsistent with the current set of shared beliefs apparently violates the Cooperative Principle and, therefore, the partner must assume that the actor means something else. Bucciarelli and associates claim that complex acts, whether standard or ironic, are a form of non-literal language. In dealing with non-literality, the cues utilized by the listener in deriving the meaning intended by the actor are the expectations being violated, in apparent contradiction to the Cooperative Principle. As regards complex deceitful acts, the listener has to make a series of inferences in order to reconcile the actor's expressed meaning with the private beliefs attributed to the actor.

In principle, it should be possible to accommodate Grice's famous definition of conversational implicature within the framework of Cognitive Pragmatics. A complex communication act may be considered an act that involves a conversational implicature, whereas a simple communication act does not. However, a fundamental difference between the two frameworks is that Grice's proposal is narrower than ours: as we will see in detail in the following sections, the theory of Cognitive Pragmatics both explains and predicts the difference in difficulty of comprehending various kind of communication acts, including those that are not implicatures.

2.1. *Simple and complex deceptions*

A deceit is a speaker's intentional attempt to manipulate the listener's mental state in order to induce him to believe something untrue about the reality (Perner, 1991). Peskin (1996) claims that in order to comprehend a deceit, it is necessary that the speaker take as shared with the listener something the speaker does not really believe. Peskin also claims that it is necessary to understand that the listener thus comes to hold a false belief. Peskin observes that only at 4 years of age and older do children fully comprehend the deceptive intention of the speaker.

Data in the literature reveal that children of different ages differ in their ability to deal with deceptions. In particular, as a first step, children start to use simple forms of deceptions, namely lies. Lies are commonly defined as false utterances made with the intention to deceive (Bok, 1978; Sodian, 1991). An example of a typical situation in which lies are investigated is that in which children are asked to tell a puppet A, who does not want another puppet B to find a hidden piece of candy, which of two locations to suggest for puppet B. Bussey (1989) and Lewis et al. (1989) find that children start to use lies as a means of escaping a disagreeable consequence from the age of three years. Leekman (1992) states that the liar aims to achieve some goal by saying something that he/she knows or believes is untrue. In the liar's view, there are progressive steps in the structure of a lie/deception.

Sullivan et al. (1994), as well as Russell et al. (1995), also find that children may encounter various levels of difficulty in understanding different deceptions. They claim that the reason for the difficulty in understanding deceptions does not seem to be due to the fact that young children are unable to conceive the possibility of implanting false beliefs into another person's mind, but rather to the cognitive load that comprehension of complex deceptions requires.

In Cognitive Pragmatics terms, a deception is a premeditated rupture of the rules governing sincerity in the behavior game at play. Deceiving requires the actor to break such rules and to construct a suitable strategy to successfully modify the partner's knowledge. For example, the actor, while privately believing that p is untrue, tries to convince the partner that p is true. If this attempt succeeds, the partner will believe p to be shared with the actor. Thus, all forms of deception, including lies, are attempts to modify the partner's mental state (but cf. Perner, 1991). Consistent with proposals made by Sullivan et al. (1994) and Russell et al. (1995), the relative difficulty of

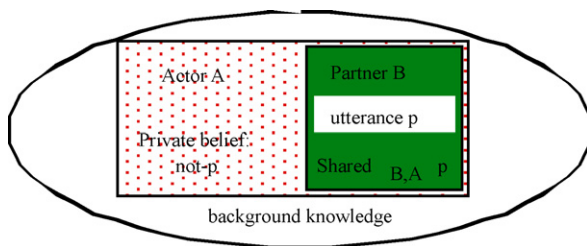


Fig. 1. Actor A plans to deceive partner B. While believing *not-p*, A tries to induce B to consider *p* as shared with her.

comprehension can vary according to the complexity of the actor’s mental state at the time of presentation of the deceit. Bara et al. (1999a) claim that some deceitful communication acts are simple because they consist of an utterance (*p*) that denies something (*not-p*) that would allow the partner to immediately refer to the game the actor wishes to conceal (Fig. 1).

On the other hand, a complex deceitful communication act consists of a communication act (*q*) that implies a belief (*p*) which leads the partner to a different game from the game that would be reached if the partner had access to the actor’s private belief (*not-p*) (Fig. 2). Thus, the difficulty in comprehending a deceit depends on the complexity of the inferential chain needed to refer the utterance to the game bid by the actor.

Examples of a simple and complex deceit from our experiment are:

- [6] Pietro and Lucia are playing in the courtyard. Mario comes along; he is not a very nice boy, but he always wants to play with them. Mario says: ‘Are you playing?’
Pietro replies:
Simple: ‘We’re not doing anything.’
Complex: ‘We’re going home.’

The utterance ‘We’re not doing anything’ is an example of simple deceit because it consists of the negation of something (we are playing) that would allow the partner to immediately refer to the game [PLAY-TOGETHER] the actor wishes to conceal. By contrast, the utterance ‘We’re going home’ is an example of complex deceit because it consists of an utterance that implies a belief (going home means not playing), that leads the partner to a different game [SAY-BYE] from the game that would be reached if the partner had access to the actor’s private belief [PLAY-TOGETHER]. Thus, we consider simple deceits instances of lies; they are intentional messages aimed at deceiving.

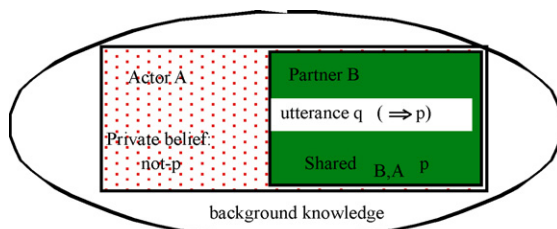


Fig. 2. Actor A plans to deceive partner B. While believing *not-p*, A tries to induce B to believe *q*, which implies *p*. The goal is to induce the partner to consider *p* as shared with A.

2.2. Simple and complex ironies

Some ironies are very easy to comprehend. In particular, there are those that can be interpreted by assigning them a meaning that is opposite to that literally expressed by the speaker (see Grice, 1978, 1989; Searle, 1979). In a Gricean-inspired account of irony comprehension, an ironic utterance expresses the opposite of what is meant by the speaker. We interpret some studies on very young children as consistent with such a claim. For instance, Reddy (1991) mentions some categories of things and situations that children find funny, for example: the non-serious use of affect signals, i.e., pretending to cry; creating a false expectation and disrupting it; opposing another's actions/intentions or directives/expectation with amusement, etc. We suggest that underlying such kinds of interactions is the violation of the expectation (*not-p*) that the canonical outcome (*p*) of an interactive event will occur. The author cites the following example: in a supermarket, when Stephanie's mother hears Stephanie (7 months old) scream, she turns around quickly and somewhat alarmed, only to see Stephanie sitting in her carriage grinning at her. Dunn (1991) has analyzed children's jokes, finding that 2- and 3-year-olds have a remarkable and differentiated understanding of what their family members will find funny. As Dunn points out, sharing a joke implies, at some level, an expectation that another person will also find this distortion of the expected event absurd or comic.

Other ironies are more difficult to comprehend, as they consist in more than merely the expression of a meaning that is the opposite of the intended meaning (Sperber and Wilson, 1981, 1995; Gibbs and O'Brien, 1991). Thus, Sperber and Wilson (1981, 1986/1995) advanced the Echoic Mention theory, which helps explain how some utterances are ironic without implicating the contrary of what is said. Let us consider, for example, the following example that Sperber and Wilson take from Voltaire's *Candide*:

[7] 'When all was over and the rival kings were celebrating their victory with
Te Deums in their respective camps...'

Voltaire echoes the two kings' identical claims, showing that they are contradictory: it is clear that at least one king's claim is false. The ironic utterance is an echoic mention in which the ironist expresses his/her attitude toward the proposition that he/she is echoing (see also Jorgensen et al., 1984).

Giora et al. (2007) propose that irony computes the gap between what the speaker says and what he means, and that the size of such a gap generates different degrees of 'ironiness': a wide gap results in a high degree of ironiness. The authors point out that, in line with both Giora (1995, 1997) and the Echoic Mention theory (Sperber and Wilson, 1986/1995), ironies echoing implicit or low-accessibility information contribute to the sophistication of the utterance and thus to its aptness. Unfortunately, the proposal by Giora and her associates is not directly comparable with our proposal, as they analyze adults' judgments as regards the level of sophistication of ironic statements, but not differences in difficulty of comprehension between more or less sophisticated ironic utterances.

Clark and Gerrig (1984) propose an alternative explanation: the Pretense Theory of Irony. According to this proposal, the listener's comprehension of an ironic utterance crucially depends on the common ground he/she takes as shared with the speaker, their mutual beliefs, mutual knowledge and mutual presuppositions. When there is no such common ground, the authors show that the listener has no way of recognizing the pretense (see also Clark, 1996; Gerrig and Goldvarg, 2000). Consistently, Kumon-Nakamura et al. (1995) claim that ironic remarks are

effective by alluding to a failed expectation. According to their Allusional Pretense Theory of Irony, ironic utterances have two main features: the speaker expresses a certain attitude and is patently insincere. Irony is used to direct the listener's attention toward a discrepancy between what is and what should have been.

According to the latter theories, irony involves both metarepresentational and sophisticated inferential abilities. These assumptions are supported by experiments with children older than those studied by Reddy (1991). A study on the ability of 6- and 8-year-olds to provide ironic endings to unfinished stories was carried out by Lucariello and Mindolovich (1995). The authors claim that the recognition and construction of ironic events involve the metarepresentational skill of manipulating event representations. These representations must be transcended, critically viewed and disassembled in order to create new and different (and ironic) event structures. On their model, it is possible to make a distinction between simple and complex forms of ironies; their results show that older children construct more complex ironic derivations from the representational base than younger children do. Since their study focuses on situational irony, the simple and complex forms of irony studied by the authors are not equivalent to the simple and complex forms of irony we investigate. However, we find it relevant for our study that other authors suggest a distinction between simple and complex forms of (situational) irony.

Cognitive Pragmatics claims that irony can be understood when compared with the scenario provided by the knowledge the actor shares with the partner. The partner has to infer a non-literal meaning which contrasts with the background against which the ironic utterance stands out. The background of knowledge that the partner shares with the actor allows the partner to comprehend the ironic meaning of the utterance. For example, Ann and Ben have attended a very tedious conference, after which Ann says:

[8] 'What an interesting conference we've been to!'

Ben can grasp the ironic meaning of the utterance, because he shares with Ann the knowledge that the conference was tedious.

Bara et al. (1999a) claim that not all ironies are equally difficult to comprehend: e.g., in simple irony, the meaning of the utterance immediately contrasts with a belief shared by the actor and the partner. In other occasions, the detection of such contrast requires a series of inferences. In particular, it is assumed that irony comprehension develops in two stages. In the first, children start mastering simple irony à la Grice: the actor utters p to mean $not-p$ (Fig. 3). Thus, simple ironies immediately contrast with a shared belief.

In the second stage, children learn to perform more subtle inferences, until they reach the levels of complex irony. Comprehension of complex ironies always involves the detection of

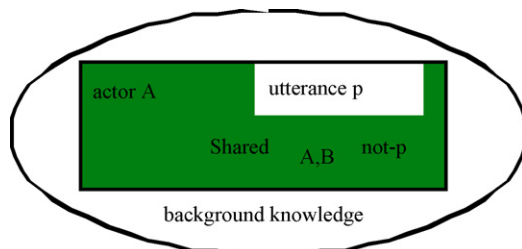


Fig. 3. Actor A expresses an ironic utterance p which overtly contrasts with the belief $not-p$, shared by A and B.

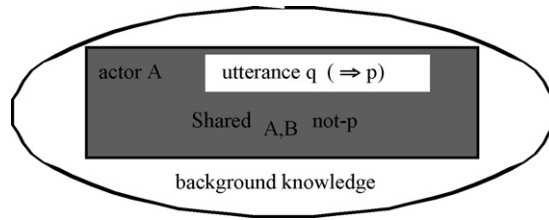


Fig. 4. Actor A expresses the ironic utterance q which implies the belief p , which contrasts with the belief $not-p$, shared by A and B.

their contrast with the shared beliefs, but in this case, the partner has to go through a complex inferential chain to detect such a contrast (Fig. 4).

Thus, the actor expresses the ironic utterance q , which implies the belief p , which contrasts with the belief $not-p$, shared by the actor and partner. Also in this case, as for deceits, the level of complexity of an irony may differ. An example of simple and complex irony from our experimental protocol is the following:

- [9] Anita is with her friend Paolo and is looking for her glasses. She doesn't realize her glasses are right in front of her nose and she asks Paolo: 'Have you seen my glasses?'
- (a) Simple: 'Congratulations on your excellent eyesight!'
- (b) Complex: 'I'd ask you if I had to thread a needle'

Our example [9a] is a case of simple irony because '... your excellent eyesight' immediately contrasts with a belief shared by actor and partner, i.e., 'You can't see what's right in front of your nose'. By contrast, [9b] is a case of complex irony because it implies the belief ('You have good eyesight') contrasting with the belief shared by actor and partner ('You can't even see what's right in front of your nose').

2.3. Simple standard, deceitful and ironic acts

The second purpose of the present paper is to compare the different degrees of difficulty in comprehending different sorts of simple communication acts, in particular simple standard communication acts, simple deceits and simple ironies. Still within the framework of Cognitive Pragmatics, Bucciarelli et al. (2003) provide a more fine-grained analysis of those factors that affect the difference in difficulty of comprehending different pragmatic phenomena (Fig. 5).

In our definition, a complex communication act requires a long inferential process to be referred to the behavior game bid by the speaker. However, we do not have the theoretical ability to predict the length of that process. Consequently, we are not able to make predictions regarding the difference in difficulty between complex acts pertaining to different categories that require, per se, different mental representations. On the contrary, on the basis of the mental representations involved, it is possible to make predictions about the difficulty of different sorts of simple acts, i.e. a simple standard communication act, a simple deceit and a simple irony. In particular, Bucciarelli et al. (2003) claim that two factors may contribute to determine the relative difficulty of comprehension of the different sorts of communication acts: the presence (or not) of conflicting representations, and the presence (or not) of representations exploiting shared beliefs.

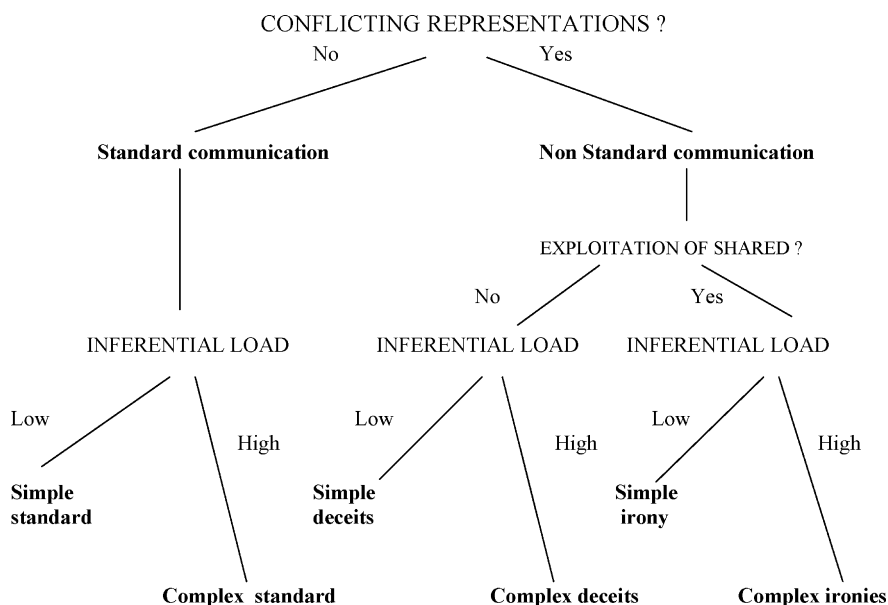


Fig. 5. Factors determining the difficulty of comprehension of pragmatic phenomena according to Bucciarelli et al. (2003). The phenomena investigated in our experiment are those in bold.

2.3.1. *Conflicting representations*

In standard communication, default rules of inference are used to understand each other's mental states. Default rules are always valid unless their consequences are explicitly denied (cf. Reiter, 1980). Indeed, in standard communication, what the actor says is in line with his/her private beliefs. Direct speech acts, conventional indirect speech acts, and nonconventional indirect speech acts are all examples of standard communication. In terms of mental representations, to comprehend a standard communication act, the partner has merely to refer the communication act proffered by the actor to the behavior game the actor bids. Thus, even young children should find it easy to comprehend standard communication acts (both simple and complex).

Non-standard communication, on the contrary, involves comprehension and production of communication acts via the block of default rules and the occurrence of more complex inferential processes, involving conflicts between the beliefs the actor takes as shared with the partner and the actor's private beliefs. Irony and deceit are examples of non-standard communication. Here, representations involve a difference between what the actor communicates and what he/she privately entertains. It follows that standard communication is easier to deal with than non-standard communication.

2.3.2. *Representations where shared beliefs are exploited*

In the case of deceit comprehension, the partner recognizes the difference between the mental states that are expressed and those which the actor 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 actor shares with the partner. The simultaneous activation of the representation of the actor's utterance (p) and of the

contrasting shared belief (*not-p*) makes an ironic statement more difficult to entertain for a child than a deceitful statement.

The literature on the development of human cognition reveals that the ability to detect conflicts between representations is not fully developed in children: it increases with age and correlates with the ability to reason (Bara et al., 1995, 2001b). The assumptions of Cognitive Pragmatics, along with the data from the developmental literature lead us to predict a cline in the difficulty of comprehension, from the easiest to the most difficult acts: simple standard communication acts, simple deceits, and simple ironies. More in general, we expect to find that the ability to comprehend communication acts involving conflicting mental representations increases with age. We devised an experiment to test our predictions.

3. Experiment

3.1. Material

The experiment was carried out in Italy; the experimental material (see Appendix A) consisted of nine stories (in Italian), all of which were both audio-recorded and written on a sheet of paper. Of the nine stories, three involved a standard communication act, three involved deceit and three involved irony. For each story, we devised two parallel versions one containing a simple act, the other a complex act. Examples of simple and complex standard speech acts are:

- [10] Barbara is in the kitchen with her mother. Barbara says: ‘Mommy can I have a chocolate?’
Her mother replies. . .
- (a) Simple: ‘Of course, take one’.
(b) Complex: ‘I’ll join you’

The act in (a) makes direct reference to the game [ASK-FOR-SOMETHING] and is therefore immediately interpreted as permission, whereas in order to comprehend that the act in (b) is permission, Barbara has to infer that her mother’s invitation to perform some action together implies the acceptance of her request. Simple standard acts are those that immediately answer Barbara’s question, as for example “Yes”, “Certainly”, “Go ahead”, “Here you are”, etc. Complex standard acts are those that require a longer inferential chain to be considered positive or negative answers, as for example “Which one would you prefer?”, “I’ll have one too”, “This chocolate is so good it’s impossible not to eat it!”. From an operational point of view, the procedure to discriminate between simple and complex standard communication acts consisted of seeing whether they answered the question: “Does it immediately refer to the behavior game? Does it immediately satisfy the actor’s communicative goal?”. If the answer is ‘yes’ the communication act is simple, otherwise it is complex. (As regards the role of context, social status and discourse in the comprehension of a speech act, see the studies by Bosco et al., 2003, 2004.) The number of words composing the target utterances was 7 ± 4 , and the syntactical and semantic difficulties of the target utterances were kept constant. We devised two protocols, each containing only one version of each story. One of the two protocols involved five simple acts and four complex ones; the other involved four simple acts and five complex ones. We carried out a test concerning the endings of the stories so as to ascertain that they represented proper examples of standard, deceitful, and ironic communication acts. In particular, we invited 20 students of psychology (mean age = 23 years) to judge, as part of a university course, when the ending of

each story was standard (i.e., the literal meaning expressed by the actor corresponded to his/her communicative intent and was in line with his/her private belief), when it was deceitful, and when it was ironic. The children in each age group were randomly assigned to one of the two experimental protocols so that, in analyzing data, each simple standard story was compared with the equivalent complex standard story, and each simple irony was compared with the equivalent complex one and so on. In fact, we collapsed the data across subjects. Thus, to analyze the results we collapsed the data for subject 1 (e.g., a female, age group 6;6–7 years) who dealt with protocol 1 (containing the following tasks: 1 standard simple a, 2 standard complex b, 3 standard simple a, etc., see [Appendix A](#)) on the same line in our data set as the data for subject 2 (female, age group 6;6–7 years) who dealt with the “complementary” protocol 2 (containing the following “complementary” tasks: 1 standard complex b, 2 standard simple a, 3 standard complex b, etc.). At the end, for each story the simple version was compared with the equivalent complex version.

The results of the test revealed that subjects coded 100% of the standard communication acts as proper standard acts, 94% of the deceits as proper deceits and 95% of the ironies as proper ironies. We concluded that our endings were in line with our expectations. The nine stories within each protocol were presented in two different random orders.

3.2. *Procedures*

Participants dealt with the experiment individually and in a quiet room. The children in each group were randomly assigned to one of the two experimental protocols. Thus, in each group half of them (16) were assigned to protocol 1 and half (16) to protocol 2, balanced for gender in each subgroup. The children were told they were going to play a game with the experimenter. The experimental session only started when the child was ready and happy to play with the experimenter. Each task consisted of brief audio-recorded stories (each lasting approximately 10 s). As the literature points out that the intonation of an utterance is a factor that might facilitate the comprehension of an actor’s communicative intention ([Andrews et al., 1986](#); [Capelli et al., 1990](#); [Gibbs, 1994](#)), we kept this variable under control by audio-recording the stories as they were read without emphasis (for example due to varying intonation). In order to minimize the role of attention and working memory, the children first listened to the story and then the experimenter read the story again (with no variation in intonation) while the children followed a written copy of the story. Then the experimenter asked the child a question in order to verify his/her comprehension of the actor’s communicative intention. For instance, consider the interaction in [10]. At the end of the interaction the experimenter asked the child: ‘What do you think the teacher meant?’ If the child simply repeated the teacher’s literal expression then the experimenter asked, ‘If she were to say it in another way, what would she say?’

Each experimental session was audio-recorded and two outside judges who had not been informed about the purpose of the experiment, evaluated the children’s performance. On their first judgments, and considering the global interpretation of all the different sorts of communication acts, the judges reached a significant level of concordance (Cohen’s $K = .912$). In the literature a value of K over .61 is considered a good agreement ([Landis and Koch, 1977](#); [Fleiss, 1981](#)). For the final score the judges discussed any responses on which they had not initially agreed, until they reached full consensus. In particular, the judges used the following criteria to code the children’s answers. Standard communication acts (simple and complex): the judges coded as correct (assigning a score of 1) responses revealing that the child had understood that the literal meaning expressed by the actor corresponded to the actor’s communicative intent

and that it was in line with the actor's own belief; other responses they coded as incorrect (assigning a score of 0). Deceits (simple and complex): the judges coded as correct (assigning a score of 1) responses revealing that the child had understood that the literal meaning expressed by the actor corresponded to the actor's communicative intent, but that it was not in line with the actor's own belief, i.e., that the child had understood the actor's deceitful intention; they coded the other responses as incorrect (assigning a score of 0). Ironies (simple and complex): the judges coded as correct (assigning a score of 1) responses showing that the child had understood that the literal meaning expressed by the actor did not correspond to the actor's communicative intent and that it was not in line with the speaker's own belief, i.e., that the child had understood the speaker's ironic communicative intention; they coded the other responses as incorrect (assigning a score of 0).

3.3. *Participants*

The participants were randomly selected from among middle-class pupils attending two different junior schools in Turin, Italy. There were 96 children, with 32 (balanced for gender) in each of the following age groups: 6;7–7 (mean age = 6;9 years); 8–8;6 (mean age = 8;4 years); 9;6–10 (mean age = 9;10 years). The rationale for the choice of such age groups was threefold. First, in a study on children aged from 2 to 7 years, Bucciarelli et al. (2003) investigated the children's ability to comprehend different pragmatic phenomena. A result relevant to our study is that young children (as young as those tested by Bucciarelli and associates) have a good comprehension of simple standard acts; in contrast, they still have great difficulties comprehending complex standard acts, as well as deceits and ironies (even when the latter were presented in their simple forms).

For this reason, in the present study we investigated the comprehension of standard, deceitful, and ironic acts by children aged 6 years and upward. We expect to find that they have a good ability to understand simple standard acts, and maybe also complex acts of the standard form. On the contrary, we expect to find a significant difference in children's comprehension of simple and complex deceits and simple and complex ironies.

Furthermore, the youngest group of participants was selected on the basis of their supposed reading ability. Actually, the experimental material was presented both in oral and written form in order to reduce the attention and working memory load. Finally, the oldest group of participants was selected on the basis of experiments in the literature detecting a performance in irony comprehension that was not at top level (Dews et al., 1996).

3.4. *Results*

As a first step in the analysis of our results, we performed a series of Friedman's analyses of variance to ascertain that within each pragmatic category (e.g., simple standard communication acts), the three relative pragmatic tasks were comparable for difficulty when each age group was considered separately. The results of the analyses showed the triplets of tasks to be homogeneous in difficulty within each category and each group (Friedman test: χ^2 ranging from .09 to 1.97; p ranging from .37 to .95). An exception are the three ironic simple speech acts in the youngest children (Friedman test: $\chi^2 = 8.7$ $p = .01$), in that the second one (simple irony 2a, see Appendix A) is much more difficult than the others. Our post hoc explanation is that it makes reference to a behavior game (EXAM) not yet acquired by children so young.

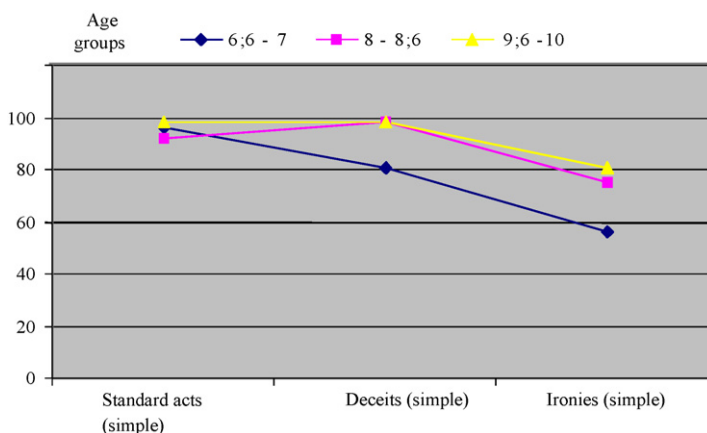


Fig. 6. Trend in the difficulty of comprehension of simple standard, deceitful and ironic speech acts, with correct answers expressed as percentages.

Considered globally, the results of the experiment confirm our predictions. The histogram in Fig. 6 illustrates the participants' global performance with simple and complex acts of different sorts.

3.4.1. Standard communication: simple communication acts vs. complex communication acts

Table 1 shows the percentage of correct performance in the three groups of children with simple and complex standard communication acts. With all the children, simple communication acts are comprehended as easily as are complex communication acts (Wilcoxon test: two-tailed $z = -1.35$; two-tailed $p = .17$). The same result holds for the age groups considered separately (Wilcoxon test: two-tailed z value ranging from -1.51 to 0 , two-tailed p value ranging from $.13$ to $.99$). We also did a post hoc control to check whether the ease of comprehension of simple standard acts could have been due to the use of the word "No" in story number 2 in Appendix A. Thus, we compared performance with the simple standard act in story number 2 with performance with the two simple standard acts in stories 1 and 3, where the word "No" does not occur in the critical communication act. We found no statistically significant difference when considering subjects overall (Wilcoxon test: two-tailed $z = -1.63$; two-tailed $p < .1$) and each age group separately (Wilcoxon test: two-tailed z ranging from -1.41 to $.58$; two-tailed p ranging from $.16$ to $.56$).

Table 1
Percentages of correct performance with simple and complex standard communication acts

Age groups ($N = 32$)	Standard acts		
	Simple ($n = 3$)	Complex ($n = 3$)	Global % ($n = 6$)
6;6–7	96	85	91
8–8;6	92	92	92
9;6–10	98	96	97
Total %	95	91	93

Table 2
Percentages of correct performance with simple and complex decepts

Age groups ($N = 32$)	Decepts		
	Simple ($n = 3$)	Complex ($n = 3$)	Global % ($n = 6$)
6;6–7	81	77	79
8–8;6	98	83	91
9;6–10	98	96	97
Total %	92	85	89

3.4.2. Decepts: simple communication acts vs. complex communication acts

Table 2 shows the percentage of correct performance in the three groups of children with simple and complex decepts. With all the children, simple decepts are easier to comprehend than complex decepts (Wilcoxon test: two-tailed $z = -1.93$, two-tailed $p = .05$). Breaking down the results by age group, this prediction holds for the middle age group (8–8;6 years old, Wilcoxon test: two-tailed $z = -2.33$, two-tailed $p < .02$) but not for 6-year-olds (Wilcoxon test: two-tailed $z = -.62$, two-tailed $p = .6$) and 9-year-olds (Wilcoxon test: two-tailed $z = .58$, two-tailed $p = .56$).

3.4.3. Ironies: simple communication acts vs. complex communication acts

Table 3 shows the percentage of correct performance in the three groups of children with simple and complex ironies. With all the children, simple ironies are easier to comprehend than complex ironies (Wilcoxon test: two-tailed $z = -3.45$, $p < .006$). The same result holds for 8-year-olds (Wilcoxon test: two-tailed $z = -2.86$, $p = .004$) and 9-year-olds (Wilcoxon test: two-tailed $z = -2.16$, two-tailed $p = .03$), but not for 6-year-olds (Wilcoxon test: two-tailed $z = -1.11$, two-tailed $p = .26$).

3.4.4. Trends in the difficulty of comprehension of simple communication acts

According to our proposal there is a trend in comprehension difficulty for the pragmatic phenomena investigated, from the easiest to the most difficult: simple standard communication acts, simple decepts, and simple ironies (see Fig. 7). Such a prediction holds over all participants (Page's L test: $L = 463$, two-tailed $p = .0005$), even when considering each age group separately (Page's L test: L ranging from 118.5 to 201 two-tailed ranging from $p .005$ to $.05$). Thus, if we consider all of the three investigated phenomena together, there is a trend in difficulty as regards their comprehension.

Let us analyze this issue in more detail, by comparing simple standard acts with simple deceitful acts, and simple deceitful acts with simple ironic acts. Contrary to our expectations,

Table 3
Percentages of correct performance with simple and complex ironies

Age groups ($N = 32$)	Ironies		
	Simple ($n = 3$)	Complex ($n = 3$)	Global % ($n = 6$)
6;6–7	56	40	48
8–8;6	75	42	58
9;6–10	81	60	71
Total %	71	47	69

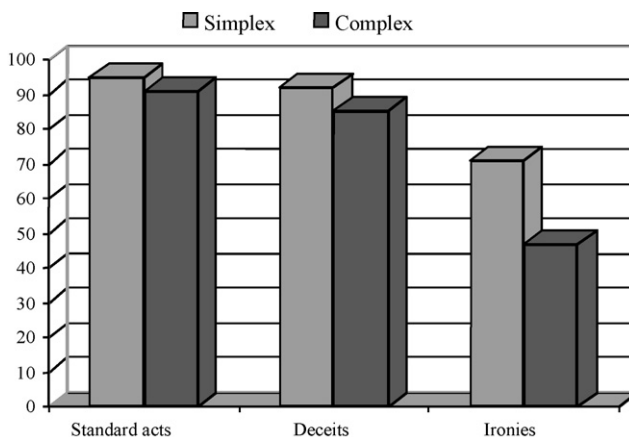


Fig. 7. Histogram of percentages of correct performance with simple and complex speech acts of different sorts, with correct answers expressed as percentages.

standard simple acts are not easier to comprehend than are simple deceits for participants overall (Wilcoxon test overall: two-tailed $z = -.94$, two-tailed $p = .34$). Breaking down the results by age groups, our prediction holds for 6-year-olds (Wilcoxon test: two-tailed $z = -2.11$, two-tailed $p < .03$), but not for 8-year-olds and 9-year-olds (Wilcoxon test: two-tailed z ranging from -1.34 to $.00$; two-tailed p ranging from $.18$ to $.99$).

Regarding simple deceits versus simple ironies, the former are easier to comprehend than the latter. This result holds for participants overall (Wilcoxon test overall: two-tailed $z = 0-4.35$, two-tailed $p < .001$, see Fig. 7), as well as for the single age groups considered separately (Wilcoxon test: two-tailed z ranging from -2.65 to -2.53 ; two-tailed p ranging from $.01$ to $.008$).

Furthermore, a comparison between simple standard acts and simple ironies reveals that the former are easier to comprehend than the latter. This result holds for participants overall (Wilcoxon test overall: two-tailed $z = 0-4.53$, two-tailed $p < .001$, see Fig. 7), as well as for the single age groups considered separately (Wilcoxon test: two-tailed z ranging from -5.35 to -2.3 ; two-tailed p ranging from $.01$ to $.0001$).

Finally, we find that the ability to comprehend simple communication acts increases with age when considered globally (Kruskal–Wallis: two-tailed $H = 12.28$, $p < .002$). The results broken down by simple phenomena of different sorts reveal that the children’s ability to comprehend simple deceits (Kruskal–Wallis: two-tailed $H = 13.14$, $p < .002$) and simple ironies (Kruskal–Wallis: two-tailed $H = 7.95$, $p < .002$) increases with age, whereas their ability to comprehend simple standard acts does not (Kruskal–Wallis: two-tailed $H = 2.29$, $p = .32$). As regards complex communication acts we find that, when considered globally, the ability to comprehend complex communication acts increases with age (Kruskal–Wallis: two-tailed $H = 9.54$, $p < .009$). The results, broken down by simple phenomena of different sorts, reveal that the children’s ability to comprehend complex deceits (Kruskal–Wallis: two-tailed $H = 6.88$, $p = .03$) increases with age, whereas their ability to comprehend complex standard acts and complex ironies does not (Kruskal–Wallis: two-tailed H ranging from 3 to 3.9 , p ranging from $.14$ to $.22$).

Finally, the results of ANOVA analysis confirms the results obtained with the previous non-parametric tests: ANOVA 3 (pragmatic phenomenon: standard, deceit, irony) \times 2 (inferential chain: simple, complex) \times 3 (between), (age group: 6-, 8-, and 9-year-olds), we found a significant effect of pragmatic phenomenon (ANOVA = $F 2.90$; $p < .0001$), inferential chain (ANOVA = F

1.45; $p < .0001$), and age (ANOVA = F 1.45; $p < .0001$). Also, the interaction between pragmatic phenomenon and inferential chain is significant (ANOVA = F 2.90; $p = .011$).

4. Discussion and conclusions

The experimental evidence in the developmental literature contradicts Searle's distinction between direct and indirect speech acts (see, e.g., Gibbs, 1994; Bara and Bucciarelli, 1998). Following the assumptions by Bara et al. (1999a) and Bucciarelli et al. (2003), we have proposed a more general distinction between simple and complex communication acts, which applies not only to standard communication acts, but also to communicative phenomena such as ironies and deceptions. We based our experimental hypotheses on the mental representations and inferential processes of varying complexity that we assumed to be involved in the different sorts of communication acts we investigated. To test our hypothesis we used a developmental perspective assuming that the children's ability to deal with representations of increasing complexity increases with age (Bucciarelli et al., 2003; Bosco et al., 2006). We expected to find that the participants in our experiment were old enough to comprehend simple and complex acts of the standard sort equally well, these pragmatic phenomena being the easiest of those considered. On the contrary, we expected to find differences in the difficulty of comprehending simple and complex non-standard acts. The results for our subjects overall fully confirm these predictions, i.e., simple deceptions are easier to comprehend than complex deceptions and, analogously, simple ironies are easier to comprehend than complex ironies. However, as regards deceptions, the results broken down by groups reveal that the youngest children performed as predicted, but show no statistically significant difference in performance with simple and complex acts. Moreover, the oldest children performed at top level with both simple and complex deceptions. As regards irony, the youngest children performed at bottom level, i.e. they performed poorly both with simple and complex ironies. According to our hypothesis, irony is the most difficult pragmatic phenomenon among those we investigated, and, indeed, few of the participants in our experiment comprehended ironies.

We also predicted a trend in the difficulty of comprehension of different sorts of pragmatic phenomena: from the easiest to the most difficult, from simple standard communication acts to simple deceptions and simple ironies. Taken globally, the results of the experiment confirm this prediction, both for participants overall and in the separate age groups. A more detailed analysis comparing simple standard acts with simple deceptive acts, and simple deceptive acts with simple ironic acts reveals that simple ironies are the most difficult communication acts to comprehend, both for participants overall and considering the single age groups separately. In contrast, standard simple acts are not easier to comprehend than are simple deceptions, both if one considers the subjects overall and the 8- and 9-year-olds separately. An explanation consistent with the rest of the results is that from the age of 8 years, children understand both sorts of simple communication act well.

We now wish to focus on our result revealing that all children in the study found a simple irony more difficult to comprehend than a simple standard act. The priority of literal meaning of an utterance versus non-literal meaning is an issue that has frequently been discussed in the literature. According to Glucksberg (1989) and Sperber and Wilson (1986/1995) for example, irony comprehension is not more difficult than the comprehension of literal sentences. In proffering an ironic act, a speaker reveals her attitude through the 'echoing' of a conventional shared belief; to comprehend this ironic intention the listener does not have to entertain the literal meaning in order to understand the speaker's communicative intention. In line with this perspective, Gibbs and O'Brien (1991) claim that, in contrast with the traditional Gricean view, the comprehension of ironic utterances does not require specific inferential processes. In support of this claim, Gibbs

(1986b) finds that adult readers take no longer to interpret an ironic use of a remark, i.e., ‘He’s a fine friend’ than they do in contexts where the literal meaning is more appropriate.

In contrast, Giora (1995) points out that the cognitive process involved in comprehending an ironic utterance is more complex than that used for a (salience-based) literal utterance, and she offers an alternative explanation of irony comprehension. According to the graded salience hypothesis (Giora, 1997, 2003), the salient meaning of the utterance is activated unconditionally and interferes with the appropriate non-salient interpretations, which therefore take longer to derive (Giora et al., 2007). According to such a view, irony takes longer to understand than non-ironic language because its comprehension involves the activation of the salient, contextually inappropriate (literal) meaning, initially, and only later is the listener/reader able to derive the non-salient ironic interpretation. This assumption has been confirmed among adult readers (Giora and Fein, 1999a; Giora et al., 1998, 2007). In addition, the results of a study by Giora and Fein (1999b) on 9-year-olds suggest that comprehension of an utterance proffered in an ironically biased context involves the activation of the literal meaning as well as of the ironic meaning, whereas comprehension of the same utterance proffered in a literally biased context activates the intended literal meaning, but not the ironic meaning. Our hypotheses (although based on a different theoretical framework), as well as our experimental results, are in line with Giora and associates’ findings. Further, if we consider that only 5% of the adults in our pre-test judged irony incorrectly, we can conclude that the context in our ironies was strong enough to allow for alternate readings. Future research might investigate children’s irony interpretation in even stronger contexts.

Finally, our results concerning the trend in the difficulty of comprehension of simple acts of different sorts are in line with Demorest et al. (1984) and Winner and Leekman (1991). Demorest et al. (1984) hypothesize that children first compute an utterance by assuming that the speaker’s belief and communicative purpose are in line with what is said. As a second step, children can understand that the speaker’s beliefs are inconsistent with the speaker’s words; however, children always interpret this incoherence as a deception. Finally, deception and sarcasm are accurately discriminated. The results of their experiment show that 6-year-olds often interpret false remarks as sincere, while 9 and 13-year-olds tend to experience deliberately false remarks as deceptive; even remarks that are obviously sarcastic are then interpreted as deceptions. After the age of 13, the sarcastic purpose is recognized. To sum up, irony comprehension is more difficult than comprehension of deceit. In line with the latter authors’ results, our 9-year-olds perform much better than 6-year-olds on irony comprehension.

Winner and Leekman (1991) also found that irony comprehension is more difficult than comprehension of deceit. The children aged 5–7 years who participated in their experiment were more able to detect the speaker’s attitude when, in the same story, the speaker proffered a deceptive rather than an ironic statement. Thus, our results parallel the results of their experiment, although Winner and Leekman’s explanation differs from ours; they assume that irony comprehension is more difficult than deceit comprehension because it requires second-order mental representations (see also Winner, 1988/1997).

More in general, one may wonder whether our results might be explained in terms of the role that the ‘theory of mind’ (ToM: Premack and Woodruff, 1978) plays in the comprehension of communication acts (see, e.g., Sperber and Wilson, 2002; Tirassa et al., 2006a, 2006b). Indeed, one could argue that ToM plays a greater role in the comprehension of deceptions (Flanagan, 1992; Sodian and Frith, 1992) and ironies (Happé, 1993) than of standard acts, and for this reason deceptions are more difficult to comprehend than standard acts. Further, one could argue that ironies are harder to comprehend than deceptions because they involve a second-order mental representation

and not just a first-order mental representation, as do deceits (Winner and 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 in terms of the role played by ToM; our 8–10-year-old children performed better with deceits than with ironies, although we can assume, in line with the literature, that at 8 years of age they have no problem inferring second mental states (Perner and Winner, 1985). In conclusion, our data show that the capacity to deal with second-order mental representations (ToM) cannot be the only factor explaining the difference in difficulty of comprehending deceit and irony. For these reasons, we conclude that our trends cannot be explained exclusively on the basis of an increasing role of the ToM in the pragmatic tasks investigated.

Also consistent with our assumptions is the fact that we detected improvements in the children's ability to comprehend simple and complex deceits and simple ironies with their increase in age, while no increase was observed in their ability to comprehend simple and complex standard communicative acts. As regards complex ironies, we did not find any significant difference with increase in age. This result is not surprising: complex irony is the most difficult phenomenon we considered and all children, even the oldest had problems with its comprehension. The results concerning deceits are in line with Peskin's (1996), who found that only from 7 years of age children are able to tell lies well. Furthermore, the results concerning ironies are in line with Dews et al.'s (1996), who found that children, contrary to adults, appreciate those ironic comments that explicitly state the opposite of what is meant (direct irony) more than they do ironic comments that imply something that is the opposite of what is said (indirect irony). In our terminology, children comprehend direct ironies better than indirect ironies in that the former are simple communication acts and the latter are complex communication acts.

In conclusion, our data, considered globally, are in favor of the existence of simple and complex pragmatic phenomena, in particular simple and complex deceits and simple and complex ironies. Therefore, any comparison between the abilities to comprehend different sorts of pragmatic phenomena ought to be concerned with simple communication acts. The matter is relevant for analyses of the comprehension of communication acts within a unifying framework with the aim to both explain and predict an individual's ability to comprehend different pragmatic phenomena.

Acknowledgments

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Appendix A. Experimental protocol

In this experiment, the same story occurs in the two experimental protocols ending with two different communicative acts: in protocol 1, the speech act marked (a) occurred, in protocol 2, the one marked (b).

STANDARD

1. THE CHOCOLATE

Barbara is in the kitchen with her mother. Barbara says: 'Mummy can I have a chocolate?' Her mother replies:

(a) Simple: ‘Of course, have one’

(b) Complex: ‘I’ll join you’

2. THE CARTOON

This evening, Giorgio and his father are watching TV. Giorgio says: ‘Daddy, can I watch a cartoon?’ His father replies:

(b) Simple: ‘No, you have to go to bed’

(a) Complex: ‘You have to get up early for school tomorrow’

3. IN THE CLASSROOM

Manuela is in the classroom and is drawing with her classmates. Manuela says to the teacher. ‘Miss, I’ve made a mistake in my drawing’. The teacher replies:

(a) Simple: ‘Rub it out then’

(b) Complex: ‘Have you got an eraser?’

DECEIT

4. IN THE COURTYARD

Pietro and Lucia are playing in the courtyard. Mario comes along, he is not a nice boy, but he always wants to play with them. Mario says: ‘Are you playing?’ Pietro replies:

(b) Simple: ‘We’re not doing anything’

(a) Complex: ‘We’re going home’

5. THE ARGUMENT

Daniela leaves the bar as Anna arrives. Anna tells Daniela that she doesn’t want to meet Federico. Federico asks her: ‘Do you know where I can find Anna?’ Daniela replies:

(a) Simple: ‘I don’t know’

(b) Complex: ‘I’ve been at home all day’

6. THE BROKEN WINDOW

Andrea breaks one of the windows in his own house. His mother comes to the scene and asks him: ‘Who broke the window?’ Andrea replies:

(b) Simple: ‘I don’t know’

(a) Complex: ‘I saw the boy from next door playing with a ball’

IRONY

7. THE CANDY

Carlo and Lucia are sitting in front of a box of candy. Lucia unwraps the last candy and eats it. There is nothing left for Carlo and he says.

(a) Simple: ‘That was very kind of you’

(b) Complex: ‘I like to be kind, too’

8. THE EXAM

Chiara has a final exam and is nervous. She meets Luca who says: ‘It’s a really difficult exam’. Chiara replies:

(b) Simple: ‘That’s very encouraging!’

(a) Complex: ‘You’re the right person to have around before an exam’

9. THE GLASSES

Anita is with her friend Paolo and is looking for her glasses. She doesn’t realize her glasses are right in front of her nose and she asks Paolo: ‘Have you seen my glasses?’

(a) Simple: ‘Congratulations on your excellent eyesight!’

(b) Complex: ‘I’d ask you if I had to thread a needle’

At the end of each interaction the experimenter asked the child: ‘What do you think the [name of the actor] meant?’

If the child simply repeated the actor’s answer the experimenter asked: ‘If he/she were to say it in another way, what would s/he say?’

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

4bis. IN CORTILE

IN THE COURTYARD

Pietro e Lucia stanno giocando in cortile. Arriva Mario, lui
 [Pietro and Lucia are playing in the playground. Mario comes along, he]
 non e’ molto simpatico ma vuole sempre giocare con loro.
 [isn’t a nice boy and he wants to play with them].

Mario dice: “State Giocando?”. Pietro risponde:

[Mario says: ‘Are you playing?’ Pietro replays:]

Simple: ‘Noi non stiamo facendo niente’

[Simple: ‘We’re not doing anything’]

Complex: ‘Noi stiamo andando a casa’

[Complex: ‘We’re going home’]

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Further reading

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