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The fundamental context categories in understanding communicative intention

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Abstract

We propose a taxonomy of the different categories of context which contribute to reconstruct the communicative intention of a speaker. In particular, we investigate the following categories: Access, Space, Time, Discourse, Move, and Status. We propose that different contexts pertaining to the same category make the hearer assign different communicative meanings to the same expressive act. We validate our expectations through an experiment on three groups of children aged 3–7 years. The results confirm our predictions and reveal that different context categories and within them, different contexts, play different roles in the reconstruction of the communicative intentions in children belonging to the different age groups.

Keywords: Context categories; Comprehension; Communicative intention; Developmental psycholinguistics; Cognitive pragmatics; Behavior game

1. Introduction

Context is commonly defined as a series of factors that contribute to reconstructing the meaning intended by a speaker in a communicative exchange. Unfortunately, such a definition is so general that it risks being useless; in particular, its pragmatic perspective is too vague, especially when it comes to the role played by the context in the reconstruction of a speaker's meaning. For instance, as Grice (1975) has pointed out, in language use, some content cannot directly be transmitted by words, but is implied by what the speaker utters. In some occasions, he argues, particular

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contextual features help the hearer to reconstruct the speaker's communicative intention. Thus, in case of doubt, the context makes clear to the hearer the meanings an utterance was intended to convey. In particular, Grice considers that an agent can rely on both the linguistic and the extralinguistic context in comprehending conversational implicatures.

Gibbs (1986) has pointed out that some particular social contexts such as, for instance, the presence of potential obstacles for the addressee in complying with a request, can make a request into a conventional, indirect speech act. Ackerman (1978) analyzed the role of the context in the comprehension of non-conventional, indirect speech acts. He pointed out that both adults and children vary in the interpretation of the same speech act (literal vs. indirect) as a function of the context of enunciation. Shatz (1978) found similar patterns of results in young children aged 1;7 to 2;10 years.

Clark and Carlson (1981) move beyond speech acts to claim that a listener who is trying to understand a speaker's meaning limits himself to considering the intrinsic context, i.e. the portion of information that may be needed for the comprehension to succeed. In Clark's (1992) formulation, the notion of context depends on the notion of common ground. The common ground between two agents consists of mutual knowledge, mutual beliefs, and mutual suppositions that they can share. Examples are the social norms shared by the members of a particular community (Clark and Marshall, 1992). Clark's explanation is plausible, but still quite vague.

Sperber and Wilson (1986) claim that the contents of the memory store (both encyclopedic/general and short-term) of a deductive device and the information that can be picked up from the physical environment, partially determine the choice of a context for the inferential processes involved in communicative acts comprehension. These factors determine not a single context, but a range of possible contexts. In Sperber and Wilson's view, relevance is *given* and context is a *variable*: people expect the assumption being processed to be relevant, and they try to select a context in which that expectation can be justified, namely a context through which they can maximize relevance.

Our research aims at an analysis of the context in more precise terms than those adopted in the literature. In particular, our aim is twofold:

(a) To group the countless elements that may define different contexts within definite categories. The identification of such categories results in a more precise definition of what context is.
(b) To show that the hearer's interpretation of the same utterance may vary by changing just one element pertaining to a given category, while keeping all the others constant.

2. Context in cognitive pragmatics

Speech act theory is the most representative theoretical framework within the pragmatic domain. Within this framework, the original authors focused on a philo-

sophical and logical analysis of human communication (Grice, 1957, 1989; Wittgenstein, 1961; Austin, 1962; Searle, 1969, 1975). Others analyzed the conversational and discourse aspects (Sinclair and Coulthard, 1992), while others again have recently advanced theories which focus on its psychological component. An example is cognitive pragmatics, a theory advanced by Airenti et al. (1993a,b) to account for the mental representations and processes involved in communication. The theory has proved to be able to generate predictions on the emergence of communicative competence. In particular, cognitive pragmatics predicts and explains the comprehension and production of different kinds of communicative acts, both in normal development (Bara and Bucciarelli, 1998; Bucciarelli et al., 2003) and abnormal development (Bara et al., 1999, 2001).

The theory assumes that the 'expressive meaning' of an utterance—the outcome of a syntactic and semantic analysis—is necessary, but not sufficient to reconstruct the meaning conveyed by the speaker. The term 'expressive meaning' is used in place of 'literal meaning' to stress the fact that the literal meaning per se does not exhaust the speaker's communicative intention; a similar position is defended by Gibbs (1994) and Récanati (1995). In line with cognitive pragmatics, the present authors claim that the expressive meaning is only the starting point in the reconstruction of a speaker's communicative intention: in order to fully understand this intention, the hearer has to recognize the speaker's behavior game as it is realized in the communicative act.

A behavior game is a stereotyped pattern of interaction between the participants in the dialogue. It is a plan at least partially shared by the agents. Action plans can be represented as trees of intentions, whose leaves are specified either as terminal, precisely defined actions, or as higher-level intentions to be worked out according to the context (Pollack, 1990). Consider, for example, the following expressive act:

[1] Ann: 'Do you like wine?'

The expressive meaning of the utterance, in terms of semantic content, is clear, but Ann's communicative intention may be different depending on the behavior game she is playing. As a consequence, her partner's answer may differ according to the behavior game he thinks he is sharing with Ann. For example, within the behavior game:

[2] [MARKET-RESEARCH]:
- A asks B for his preferences;
- A responds to B,

Ann's communicative intention could be to know her partner's preferences, and the partner could answer, for example:

[3] Ben: 'I have a glass of wine with every meal'.

The same expression may refer to a behavior game such as:

[4] [OFFER-TO-A-VISITOR]:
- A offers something to B;
- B accepts or refuses.

In this case the partner could answer, for example:

[5] Ben: 'Yes, please'.

The answer in [5] would not be an appropriate answer in the case of market research, while the answer in [3] would be a strange way of accepting a hostess' offer.

Thus, since the focus of our study is the goal a speaker wishes to realize, the expressive meaning of an utterance is necessary, though not sufficient, to understand the speaker's communicative intention. Conversational cooperation requires that speaker and hearer share the knowledge of the behavior game in play. Indeed, the actual actions performed by the agents determine the moves of the behavior game they are playing.

The meaning of a communicative act (either linguistic or extra-linguistic or, more often, a mix of the two) is fully understood only when it is clear which move of the behavior game it realizes. Thus, we shall consider speech acts as moves of behavior games; conversely, each move of a behavior game has a communicative value, and can therefore be considered as a speech act.

In addition to determining its moves, a behavior game specifies a typical situation where it can be played; in other words, it gives us the validity conditions of the game's moves. For instance, the actual game shared by the agents in [2] must describe the validity conditions of the request (e.g. in a supermarket, with a stranger), as well as the game played in [4] (e.g. at home, with an acquaintance).

Behavior games have a fundamental role in communication: the meaning of any communicative act can be fully understood only when the game of which it realizes a move is identified. Thus, an utterance extracted from its context of reference has no communicative meaning and cannot obtain any communicative effect. In our perspective, the context within which an utterance is proffered constitutes the validity conditions of the behavior game bid by the speaker (Bara and Bucciarelli, 1998). Thus, the physical place where the conversation between Ann and Ben occurs (e.g. in a supermarket), or Ann's status (e.g. interviewer), can constitute contextual references that allow Ann and Ben to share the behavior game [MARKET-RESEARCH]. In this context, Ben understands Ann's utterance in [1] as a question about his drinking habits.

The concrete actions involved in the moves are not specified by the behavior game. Consider, for example, the game [OFFER-TO-A-VISITOR] in [4], whose validity conditions are: at home, with an acquaintance. The move 'A-offers-something-to-B' does not specify what that 'something' is; neither does Ann mention 'wine' or what kind of wine she wishes to offer Ben. Now imagine that on the table there is a bottle of red wine: in this case, the context helps Ben understand that Ann is offering him a glass of red wine, so he might answer:

[6] Ben: 'Red wine is too strong for me'.

The recognition of the behavior game bid by the speaker does not bind the hearer to play a particular role in the game. On the contrary, the hearer can decide to accept or reject the proposed game, or to propose a different one, or to negotiate a specific one. The shared character of these knowledge structures allows the agents to maintain conversational cooperation in spite of Ben's refusal in [6] to cooperate on the behavioral level.

Notice that different speech acts may refer to the same behavior game. Thus, the hearer might accept to play the behavior game proposed by the speaker by choosing one of the possible moves consistent with that particular game. Consider, for instance, the game [OFFER-TO-A-VISITOR] in [4]. Ben might answer Ann:

[7] 'Yes, thank you'
[8] 'I love red wine'
[9] 'No thanks, I'm a teetotaler'

The same speech act may refer to two different behavior games at the same time. For example, [9] is consistent with the game [OFFER-TO-A-VISITOR] as well as with the game [MARKET-RESEARCH].

In understanding the speaker's meaning, all the relevant inferences are drawn by the hearer from a set of shared beliefs. This set contains all the beliefs actors share with one or more specific partners, with a group of people, or with all human beings. Shared belief is a primitive, i.e., a mental state not reducible to a conjunction of standard private beliefs (Clark, 1992; Airenti et al., 1993a). In our view, the beliefs that the hearer assumes as shared with the speaker concern the behavior game in play, as well as contextual information such as, for example, the status of the participants in the dialogue, the spatial location of an object mentioned by the speaker, and so on. This information guides the hearer in the reconstruction of the speaker's communicative intention.

3. Dimensions of context

Our brief review of the literature has brought out the split between the two definitions of context as *given* vs. *chosen*. In the first definition (context as *given*), the participants in a dialogue are immersed in an organized situation, which can be considered an a priori condition for comprehending an utterance:

Context => Utterance

Within the second definition (context as *chosen*), the participants in a dialogue have to choose the context which maximizes the relevance of an utterance:

Utterance => Context.

We do not accept this dichotomy. In our view, the dialogue participants mentally construct the context through the utilization of its many dimensions, among which are the proffered utterances themselves. Thus:

Context <=> Utterance.

A series of dimensions enter into the definition of context, with different levels of importance, varying in accordance with the specific situation. Each of these dimensions may in turn be the fundamental component of the context, as the participants to the dialogue represent it mentally. The context is a dynamic, interpersonal construct, in continuous progress, potentially oscillating between its dimensions and their varying relevance.

The context is determined by the features of the physical environment, by the features of the social world, and by the features of the psychological world. Referring to its multifaceted constituents, we shall speak of *categories* of context. Among the psychological dimensions, the most important context categories refer to the beliefs and the motivations of each participant, and to the empirical attribution of beliefs and motivations. However, because beliefs and motivations are taken into account by any theory of communication, we believe they may be excluded here without harming our analysis of the context.

In the physical dimension, we assume the categories: Access, Space, and Time. In the social dimension, we posit the categories: Discourse, Move, and Status.

The psychological plausibility of our theoretical assumptions was initially explored through a pilot experiment. We asked 75 students who attended a course of general psychology to imagine and write down on a piece of paper a situation where the variation of a single element of the context involved a change in meaning in a particular speech act. The situations produced by the participants, in which what changes is an element of the context, fall in the following categories (the frequencies of the different situations are added in parentheses): move performed by the speaker while uttering the speech act (32), spatial location of the agents (9), their temporal location (7), their social status (5), the discourse preceding the speech act (2), the accessibility of the objects referred to by the speech act (2), a mixture of two of the above categories (4). Some of the situations produced by the participants fell outside the experiment in that they either changed an element in the speech acts (12; e.g. Pat goes to the cinema vs. Pat goes into the cinema), or they changed the intonation of the speech act (2; e.g. question mark vs. exclamation mark).[1]

The context categories pertaining to the *physical world* were detailed as follows:

Access: having access to the physical object to which the communicative act refers (e.g., an object on which to carry out an action).

Space: the spatial distance between agents and objects of the physical world to which the communicative act refers (e.g., the distance between the hearer and the object).

[1] An early discussion of the conceptual difficulties involved in taxonomic approaches to defining linguistic pragmatic categories is found in Reeder (1983).

Time: the temporal sequence of the events to which the communicative act refers (e.g., the order of the actions performed by the agents).

The knowledge relative to the *social world* is concerned with the symbolic relationships involving the agents. In particular, we distinguish three context categories:

Discourse: the information conveyed through discourse before the communicative act was performed (e.g., what had been previously said by the speaker).

Move: the moves performed by the agents while playing a behavior game (e.g., the move actually performed by the actor).

Status: the social status of the agents (e.g. the status of the speaker is higher than the status of the hearer).

Only three of the above mentioned context categories have thus far been analyzed in the literature, viz.: Space, Discourse, and Status. In particular, it has been proven that the spatial relationship between speaker, hearer, and object mentioned can discriminate among different communicative meanings of the utterance. Reeder (1980), for example, systematically manipulates the spatial position of the speaker and the hearer (two puppets) with respect to the toy mentioned in the stimulus. The speaker is represented by an adult puppet figure, whose identity is established as the teacher. An example of a stimulus is:

[10] Teacher: 'Would you like to play with the train?'

Context alternatives:

A: the train is near the speaker and away from the hearer (Request condition)
B: the train is near the hearer and away from the speaker (Offer condition).

Then the child is asked to choose between two possible alternatives, namely:

- 'I want you to play with the train'.
vs.
- 'I'll let you play with the train'.

Reeder shows that in context A, children aged 2;6 years and 3 years interpret [10] more frequently as a request to play with the train, while they interpret it as an offer in context B.

The category Discourse has been widely explored. In particular, Marslen-Wilson and Welsh (1978) distinguish two sorts of discourse context: syntactic and semantic, referring to the constraints placed thus far on a word by the syntax, respectively the meaning of the sentence. Dooling (1972) finds this definition insufficient in that the context is not only about syntactic and semantic constraints, but also represents the previous discourse. Clark and Marshall (1992) consider this kind of contextual evidence as an acceptation of physical co-presence. However, they notice that in contrast with physical co-presence, which relies on the natural joint presence of the interlocutors, linguistic co-presence relies on the symbolic evidence of the interlocutors' joint presence.

As to the context category Status, Searle (1975) claims that the status of the speaker can affect the communicative effect of the utterance. He argues that if a general asks a soldier to tidy up the room, we consider the request as an order or a command. However, if the soldier asks the general to rearrange the room, we can consider the request as a suggestion or a proposal. Also, developmental studies show that children aged 5;6 years are aware of their own status, and that they modify their discourse according to their expectations of the social interaction (Martlew et al., 1978). Similar patterns of results are found in children aged 8–12 years (Garton and Pratt, 1990). A peculiar finding is that 10 year old children are able to vary how much information they include in their messages as a function of the age of the listener (Sonnenschien, 1988).

Although in a natural environment, all these context dimensions are simultaneously active, it is possible to devise an experimental situation in which one of them outweighs the others. Our experiment, described below, attempts to enhance the relative weight of each dimension in different communicative situations.

4. Experiment: the same utterance proffered within two different contexts of the same context category

The general assumption underlying our experiment is that the expressive meaning is necessary but not sufficient for the hearer to comprehend the speaker's meaning: the communicative meaning of an utterance is intrinsically linked to the context within which it is proffered, a context that helps to identify the move or the game bid by the speaker. Since we expect that the child's sensibility to different contexts will vary according with age, we chose as participants in our experiment, children belonging to different age groups.

In the perspective of developmental cognitive science, mental processes are studied not as fixed states, but as functions developing from childhood to adulthood (Bara, 1995). Many studies in the pragmatic literature have investigated the role of context in young children's comprehension of a speaker's communicative intention (Ervin-Tripp, 1977; Reeder and Wakefield, 1987; Reeder and Shapiro, 1993; Ebeling and Gelman, 1994); these studies suggest that contextual components play a great role in children's communication. Hence, only studying adults' comprehension would imply a potential loss of significant data.

In order to gather empirically valid data that may confirm the proposed taxonomy, it is mandatory to plan a developmental study. Adult subjects might be affected by features of the context of enunciation of an utterance in ways different from young children. Thus, we devised a developmental study with three different age groups.

In our experiment, the participants deal with the same expressive act proffered in two different contexts pertaining to the same contextual category. We envisage two possible ways in which the two contexts could affect the process of attribution of intentions: discrimination between two possible behavior games, and discrimination between two different moves of the same game. As regards discrimination of game, consider for instance the utterance

[11] 'Let's make a beautiful drawing',

proffered in two contexts pertaining to the category Space, and differing only in the variable 'distance-of-the-mentioned-object':

Context A: *Crayons and paper are on a chair near the child and away from the experimenter*
Context B: *Crayons and paper are on the table, away from the child and near the experimenter*

We expect to find that the two contexts affect the reconstruction of the speaker's meaning differently:

Interpretation in Context A: the hearer refers the utterance in [11] to the game [REQUEST: BRING-CRAYONS-TO-EXPERIMENTER], and brings crayons and sheets of paper to the experimenter.

Interpretation in Context B: the hearer refers the utterance in [11] to the game [PROPOSAL: YOU-DRAWING], and starts to do a drawing.

As regards the discrimination of two different moves of the same game within different contexts, consider for instance the utterance

[12] 'I have some little presents here, how about taking one of them?'

within the game [OFFER-OF-PRESENTS]. The utterance might be proffered within two different contexts pertaining to the category Access:

Context A: *Candies are accessible to the child, they are on the table in front of the child*
Context B: *Candies are not accessible to the child, they are on the experimenter's lap*

The utterance may assume two different communicative meanings:

Interpretation in Context A: Referring to the move 'Take-a-present', the child takes a candy.
Interpretation in Context B: Referring to the move 'Tell-me-if-you-want-a-present', the child answers 'yes' or 'no' (in the first case, possibly goes near the experimenter and waits for a candy)

Although we have expectations about *the sort* of different interpretations triggered by a specific feature of the context, our predictions are more general, in that they are concerned with the possibility to find *discriminative features* within a specific context. We make no strong claims about how such features could discriminate; the expectations for each category of context can be summarized as follows.

Access

Two basic contexts may be distinguished within this category, depending on whether the hearer has access or not to the object mentioned by the speaker. By access, we mean the ability to take hold of the object mentioned (i.e. the object is present, it can be reached in its location, it does not belong to another person). Consider the example in [12]. Context A is an example of the hearer having access to the mentioned object; context B is an example of no access. We assume that a generic interrogative utterance is interpreted either as an offer or as a question about preference, depending on whether the object mentioned in the question is accessible to the hearer or not. In particular, we predict that the question is interpreted as an offer in context A, and as a question about preference in context B. Thus, for the two contexts in [12], we expect the following interpretations:

Interpretation in A: Offer; the child takes a present.
Interpretation in B: Question about preference; the child answers 'yes' or 'no' (in the first case, possibly goes near the experimenter and waits for a candy)

Space

Two different contexts within this context category may be distinguished on the basis of the spatial relationship involving the agents and the object referred to by the utterance. An example of spatial context we have in [11], above. Here, context A is an example of the object being near the hearer and away from the speaker; context B is an example of the object being away from the hearer and near the speaker. We assume that an exclamatory utterance, such as 'Let's do action a with object x', is interpreted as a request in context A, and as a proposal in context B. Thus, we expect the following interpretations for [11]:

Interpretation in A: Request for object; the child brings crayons and sheets of papers to the experimenter.
Interpretation in B: Proposal; the child starts doing a drawing with the experimenter

Time

Two contexts within this category may be distinguished on the basis of the temporal succession of the actions involving the agents. In our experiment, we devised tasks like the following:

[13] *Experimenter and child are playing with two cuddly toys: a bear and a pig.*
Context A: *Experimenter and child play with the bear first, and then with the pig.*
Context B: *Experimenter and child play with the pig first, and then with the bear.*
Experimenter: 'How about playing with the pig?'

In context A, the action involving the agents is not concluded; in context B, it is. We assume that an interrogative utterance concerning the agents' activity is

interpreted as a request about the child's preference in context A, and as a proposal to repeat the activity in context B. Thus, for [13] we predict the following interpretations:

Interpretation in A:	Question about preference, the child says if he is enjoying himself or not.
Interpretation in B:	Proposal to play with the pig again, the child brings the pig to the experimenter

Discourse

Two contexts within this category may be distinguished on the basis of what the speaker has previously said to the hearer. An example of a Discourse context is the following:

[14] *There are two cars on the table. Experimenter and child are near the cars.*

Experimenter:	'Look, here are two toy cars: one is red and the other is blue'
Context A:	'*The red one is broken, it doesn't work*'
Context B:	'*The blue one is broken, it doesn't work*'
Experimenter:	'Choose which one you want to play with.'

We assume that the hearer's choice will take into account what the speaker has previously said. In context A, the speaker rejects the first object mentioned; in context B, the speaker rejects the second object mentioned. We assume that a generic exclamatory utterance is interpreted as a specific invitation to choose one of two objects in accordance with the speaker's previously expressed preferences. Thus, we expect the following interpretations for [14]:

Interpretation in Context A:	Invitation to choose the second object, the child chooses the blue car.
Interpretation in Context B:	Invitation to choose the first object, the child chooses the red car.

Move

Two contexts within this category may be distinguished according to the behavior move played by the speaker while performing an expressive act. Consider, for example, the behavior move involved in the following interaction:

[15] *Experimenter and child are sitting one in front of each other, near them there are some puppets.*

Experimenter:	'How about playing with the puppets?'
Context A:	*The experimenter looks at the child waiting.*
Context B:	*The experimenter is writing and doesn't pay attention to the child.*

Context A allows for a move consistent with the game [PLAYING-TOGETHER], while context B allows for a move consistent with the game [PLAYING-ALONE]. We assume that an interrogative utterance such as 'What about playing [a game]?' is interpreted either as a proposal to play the game together or a request to play the game alone, depending on whether the speaker performs a move consistent with playing the game together or alone. In particular, we predict that the interrogative utterance will be interpreted as a proposal to play the game together in context A, and as a request to play the game alone in context B. Thus, we expect the following interpretations for [15]:

Interpretation in Context A: Proposal, the child starts playing with the experimenter
Interpretation in Context B: Request, the child starts playing alone.

Status

Two contexts within this category may be distinguished according to the social status of the participants in the dialogue. An example of a task involving two different contexts of this category is the following:

[16] Experimenter: 'This is Mark [a puppet]. He is playing with his cars: he likes them very much, he plays for hours and hours and cares for nobody else'.
Context A: *Mark's mother arrives (another puppet is introduced) saying:* 'Stop playing, it's dinner time!'.
Context B: *Mark's little sister arrives (a third puppet enters the scene):* 'Stop playing, it's dinner time!'.
Experimenter: 'Will Mark stop playing or not?'

In context A, the status of the speaker is superior to that of the hearer; in context B, the status of the speaker is equal to that of the hearer. We assume that an exclamatory utterance is interpreted as an order in context A, and as a request in context B. Thus, we predict the following interpretations for [16]:

Interpretation in Context A: Order, the child says that Mark will stop playing
Interpretation in Context B: Request, the child says that Mark will not stop playing

Finally, a further aim of the experiment was to check whether children of different ages would differ significantly in terms of production of expected responses. This will be the subject of the next sections.

4.1. Procedures

The two experimenters visited the daycare centers and the primary schools for several days, in order to socialize with the children. Then, the children dealt with the experimental tasks individually and in a quiet room. They were told that they were going to play a game with the experimenters. The experimental session began only

when the child was ready and happy to play with the experimenters. Experimenter 1 started the experimental session as follows:

> 'Now we are going to play a game. You are this lady's (*pointing to experimenter 2*) helper. She has a very bad character and she gets easily angry. Don't ask for explanations about what she says, just do what you think is best. Now, you can color these drawings. When the lady wants to call you, she rings the bell. *(This procedure was necessary in order to allow the experimenters to devise the experimental material and setting for each specific task)*. When this happens you should go and listen to what she has to tell you. Are you ready to play?'.

Between one experimental task and the other the child was asked to do a drawing.

Each experimental session was videotaped. Two independent judges (who were not familiar with the goals of the research) evaluated the children's performance.

4.2. Material

The experimental protocols were set up as follows: The same utterance occurs in two different contexts (A and B) of the same context category in two protocols. Consider, for instance, a task we devised for the context category Access. In context A, the object mentioned by the speaker is accessible to the child, whereas in context B, it is not. Each protocol consists of 10 tasks, two for each of the context categories investigated. The two versions of the experimental protocol are fully described in the Appendix.

All speech acts are addressed directly to the child by one of the experimenters. In each task, the experimenter was instructed to use the same paralinguistic cues (intonation of voice, prosody, eyes direction) in proffering the utterance. The experimental material consisted of: some puppets representing individuals, sheets of paper and crayons, little boxes with presents, candies, toy cars, two books about animals, some dolls, and building blocks.

4.3. Participants

Seventy two children, randomly selected from pupils from four different schools in Turin and belonging to age groups 3–3;6, 4;6–5, and 6–7 took part in the experiment. The age groups were established on the basis of our previous studies, where we had detected significant differences among these age groups in the interpretation of the same communicative acts (Bara and Bucciarelli, 1998; Bucciarelli et al., 2003). The children in each group were randomly assigned to one of the two experimental protocols. Thus, half the children (12) in each age group were assigned to one experimental condition, and half (12) to the other, balancing male/female in each subgroup.

4.4. Results

The percentages of the different interpretations in the two contexts (A and B) of each category are shown in Table 1. For each category, the expected response in

Table 1
Global percentages of the different interpretations (a and b) in the two contexts (A and B) of each context category. (note that, in each condition, the percentages refer to the interpretation of 12 subjects)

Age groups	Access		Space		Time		Discourse		Move		Status	
	A	B	A	B	A	B	A	B	A	B	A	B
$n=12$	Int a	Int b	Int a	Int b	Int a	Int b	Int a	Int b	Int a	Int b	Int a	Int b
3–3;6	91	92	38	79	50	38	92	73	33	80	85	41
4;6–5	83	75	45	79	50	54	96	100	36	82	25	79
6–7	88	91	42	77	50	46	100	96	71	75	38	54
Global %	87	86	41	78	50	46	96	90	47	79	47	59

context A is referred to as *a*, and the expected response in context B is referred to as *b*, the unexpected responses in each of the contexts rounding up the balance to 100%.

The results confirm our predictions as to the categories *Access* and *Discourse*, where the contextual conditions assign different interpretations to the utterance.

Within the context category *Access*, as expected, the context where the object mentioned by the speaker is accessible to the hearer (context A) favors the interpretation of the interrogative utterance as an offer to take the object (interpretation *a*), whereas the context in which the object mentioned by the speaker is not accessible to the hearer (context B) favors the interpretation of the utterance as a question concerning the desire to take the object (interpretation *b*; Wilcoxon test overall: $z=-5.09$; $P=0.0001$). The same result occurs for the three age groups considered separately (Wilcoxon test: z value ranging from -2.89 to -5.09, P value ranging from 0.004 to 0.0001). Finally, the three groups of participants do not differ in terms of production of expected responses (Kruskal–Wallis test: $H=1.3$, $P=0.52$).

The same patterns of results were found for the category *Discourse* where, as expected, the context A, in which the speaker shows an indirect preference for the second mentioned object ('the blue car') over the first ('the broken down red car'), favors the interpretation of the exclamatory utterance as an invitation to select the second object, whereas the context B, in which the speaker shows an indirect preference for the first mentioned object ('the red car') over the second object ('the broken down blue car'), favors the interpretation of the utterance as an invitation to select the first object (Wilcoxon test overall: $z=5.29$, $P=0.0001$). The three age groups considered separately yield the same result (Wilcoxon test: z value ranging from -2.58 to -3.35, P value ranging from 0.01 to 0.0008). Finally, the three groups of participants do not differ in terms of production of expected responses (Kruskal–Wallis test: $H=4.63$, $P=0.1$).

As for the categories *Space* and *Move*, the results pattern in the same way, but only if we consider the global results. Within the context category *Space*, the context A, where the object of the behavior game is near the hearer, favors the interpretation of the exclamatory utterance as a request to start playing the game, while the context B, where the object of the game is away from the hearer, favors the interpretation of the utterance as a question about a desire to play the game (Wilcoxon test overall

$z = -2.74$, $P = 0.006$). These results hold for the 4;6–5 year olds (Wilcoxon test: $z = -2.12$, $P = 0.03$), but not for the 3–3;6 year olds (Wilcoxon test: $z = -1.26$, $P = 0.2$) and the 6–7 year olds (Wilcoxon test: $z = -1.14$, $P = 0.16$). Finally, the three groups of participants do not differ in terms of production of expected responses (Kruskal–Wallis test: $H = 0.19$, $P = 0.9$).

Within the context category *Move*, the speaker's move in context A favors the interpretation of the interrogative utterance as a proposal to play the game together. In contrast, where there is no such move by the speaker, as in context B, the favored interpretation of the utterance is a request to play the game alone (Wilcoxon test overall: $z = -2.69$, $P = 0.007$). This result holds for 6–7 year olds only (Wilcoxon test: $z = -2.43$, $P = 0.02$); the two contexts do not discriminate the interpretation of the speaker's meaning in 3–3;6 year olds (Wilcoxon test: $z = -1.00$, $P = 0.3$), nor in 4;6–5 year olds (Wilcoxon test: $z = -0.58$, $P = 0.6$), whereas 3 and 4 year olds always interpret the experimenter's utterance as a proposal to play together. Overall, the three groups of participants differ in terms of production of expected responses (Kruskal–Wallis test: $H = 7.5$, $P = 0.02$).

For the context categories *Time* and *Status*, the results were different from what was expected. Within the category *Time*, the context A, in which the speaker's move is part of a previous behavior game, does not favor the interpretation of the interrogative utterance as a question about the child's preferences; neither does the context B, in which the move is part of the actual behavior game, favor the interpretation of the utterance as a proposal to play the game (Wilcoxon test overall: $z = -0.65$, $P = 0.52$). Here, the three groups of participants do not differ in terms of response production (Kruskal–Wallis test: $H = 0.68$, $P = 0.7$).

The same pattern of results holds also for the category *Status*. The context (A) in which the speaker proffering the exclamatory utterance is higher in status than the hearer does not favor its interpretation in terms of an order to stop playing; likewise, the context where the speaker is a peer (B) does not favor the interpretation of the utterance as a request that can be left unattended to (Wilcoxon test over all $z = -0.83$; $P = 0.4$). The three groups of participants do differ in terms of production of expected responses (Kruskal–Wallis test: $H = 12.25$, $P < 0.002$). In particular, younger children perform more in accordance with our expectations than older children do.

5. Discussion and conclusion

The assumption underlying our research is that contextual cues pertaining to the physical and to the social world are crucial in discriminating between a speaker's communicative intentions. In particular, we have proposed that it is possible to analyze aspects of contexts in terms less vague than those offered in the literature.

In our experiment, the same expressive act was made to occur within two different contexts pertaining to the same category. The global results of our experiment show that the two contexts investigated within the categories *Access*, *Space*, *Discourse*, and *Move* do discriminate between different communicative intentions of the

speaker. The same expressive act acquires different communicative meanings according to the particular contexts within which it is proffered. In addition, for the categories *Access* and *Discourse*, the same patterns of result hold also for each age group considered separately.

For the category *Space*, the result is significant over all participants, but most so for the 4;6–5 year olds. Probably, within our experimental design, only these children are sensitive to the category Space when interpreting the speaker's utterance. If this is the case, it remains to be explained why the two contexts investigated within the category Space do not discriminate between different communicative intentions in 6–7 year olds. It could be that other contextual features—possibly not investigated in our study—overshadow the perceived relevance of the two investigated contexts in this group of children.

As regards the category *Move*, the comparison is significant over all participants, also for 6–7 year olds, though not for younger children. The results would suggest that only from 6 years upwards, children become sensitive to the specific moves acted by the speaker while proffering a speech act (e.g. if an adult invites you to play while she is doing something else, she intends to invite you to play alone).

Unfortunately, we have found no significant differences in the categories *Status* and *Time*. As far as *Status* is concerned, let us review the experimental task: a (puppet) mother/sister gives an order to (puppets) Ann/Mark, and this order contrasts with Ann/Mark's wishes. Then, the experimenter invites the children to make a prediction about the puppets' behavior. The hypothesis underlying such tasks is that children understand the mother's utterance to be an order, in contrast to an utterance coming from a peer. Unfortunately, when we constructed the experimental tasks, we did not realize that this was the only task in which we invited children to make a prediction about a future behavior and not just to attribute an intention to the speaker. So, even though the children correctly interpret the mother's utterance as an order, they still may judge that Mark/Ann will disobey and will continue to act according to their own desires. Thus, we have evaluated the communicative effect reached by two speakers of different status, rather than the different reconstruction of the meaning of the same utterance proffered by two different speakers. In particular, we found significant differences among age groups: younger children seem to be more sensitive to a parent's order than to a peer's.

The category *Time* is very difficult to investigate because it is hard to construct an experimental setting in which this variable can be manipulated (in fact, we have no knowledge of any study which considers this aspect). We believe that time is an important contextual factor affecting the hearer's interpretation of an utterance, but in our experimental procedure, Time was not sufficiently clearly defined to allow the children to evaluate the difference between the two contextual configurations.

The most relevant result of our experiment is that different contexts pertaining either to the same context category or to a different context category, affect the interpretation of a speaker's utterance differently. The results of our experiment confirm our expectations concerning the way in which two different contexts of the same context category can discriminate between two possible moves or games. However, the aim of our research was not to predict such specific ways. Rather, we

meant to identify the contexts which affect the interpretation of an utterance differently. Also, while our analysis is concerned with pairs of contexts within each context categories, still it is possible to imagine within each category (for example Space), an unlimited number of contexts which affect the interpretation of a speaker's utterance, including the spatial distance between hearer and speaker living in the same building (for example, on different floors), or in the same town, country, etc. Within the avowed methodological limits of an experimental approach to the study of context categories, our systematic taxonomy has yielded quite satisfactory developmental results, bringing our research, as we believe, close to the fertile (but also treacherous) borders of theoretical and empirical pragmatics.

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Appendix. The experimental protocols of the experiment

In this experiment the same communicative act occurs in the two experimental protocols in two different contexts: in protocol 1, in the first context presented for each task below, in protocol 2, in the second one.

A.1. Categories of the physical world

A.1.1. Access

(1) *Experimenter and child are sitting, between them there is the table.*
Experimenter: 'Here I have some little presents, how about taking one of them?'
Context A: *Presents are accessible to the child, they are in a basket on the table in front of the child*
Context B: *Presents are not accessible to the child, they are in a basket on the experimenter's lap.*
Alternative interpretations:
(a) Permission to take a present, the child takes a present.
(b) Question, the child answers yes or no/goes near the experimenter and waits for a present

(2) *Experimenter and child are sitting, between them there is the table.*
Experimenter: 'Do you like candies? Would you like to take one?'

Context B: *Candies are not accessible to the child, they are on the experimenter's lap*
Context A: *Candies are accessible to the child, they are on the table in front of the child*
Alternative interpretations:
(b) Question, the child answers yes or no/goes near the experimenter and waits for a candy
(a) Permission to take a candy, the child takes a candy.

A.1.2. Space

(3) *Experimenter is looking at some toy blocks.*
Experimenter: 'Look, what wonderful blocks, let's play with the blocks!'
Context A: *Constructions are near the child and away from the experimenter*
Context B: *Constructions are away from the child and near the experimenter*
Alternative interpretations:
(a) Request, the child brings the blocks to the experimenter.
(b) Proposal, the child starts playing with the experimenter.

(4) *Experimenter sits near the table, child is in front of her.*
Experimenter: 'Look, there is a lot of white paper and a lot of colored crayons, let's make a wonderful design!'
Context B: *Crayons and paper are on the table, away from the child and near the experimenter*
Context A: *Crayons and paper are on a chair near the child and away from the experimenter*
Alternative interpretations:
(b) Proposal, the child starts doing a drawing.
(a) Request, the child brings crayons and sheets to the experimenter.

A.1.3. Time

(5) *Experimenter and child are playing with two cuddly toys: a bear and a pig.*
Context A: *Experimenter and child play with the pig first, then they play with the bear.*
Context B: *Experimenter and child play with the bear first, then they are playing with the pig.*
Experimenter: 'How about playing with the pig?'
Alternative interpretations:
(a) Proposal, to play with the pig again, child brings the pig to the experimenter.
(b) Question, the child says if he is enjoying himself or not.

(6) *Experimenter and child have two books, one about a dog and one about a rabbit.*
Context B: *Experimenter and child look at the book about the dog first, then they are looking at the book about the rabbit.*
Context A: *Experimenter and child look at the book about the rabbit first, then they are looking at the book about the dog.*
Experimenter: 'Let's have another look at the rabbit book. It's more fun to see what the rabbit is doing, isn't it?'
Alternative interpretations:
(b) Question, the child says if he is enjoying himself or not.
(a) Proposal to read the book about the rabbit again, child brings it to the experimenter.

A.2. Categories of the social world

A.2.1. Discourse

(7) *There are two cars on the table. Experimenter and child are near the cars.*
Experimenter: 'Look, there are two toy cars: one is red and the other is blue'
Context A: '*The red one is broken, it doesn't work*'
Context B: '*The blue one is broken, it doesn't work*'
Experimenter: 'Choose a car to play with'
Alternative interpretations:
(a) The child chooses the blue car.
(b) The child chooses the red car.

(8) *There are some colored candies (yellow and red) on the table, they are near the child and away from the experimenter.*
Context B: '*I only like strawberry candies, the red ones, the other ones aren't good, they're bitter*'
Context A: '*I only like lemon candies, the yellow ones, the other ones aren't good, they're bitter*'
Experimenter: 'Please give me a candy'
Alternative interpretations:
(b) The child gives the experimenter a strawberry candy.
(a) The child gives the experimenter a lemon candy.

A.2.2. Move

(9) *Experimenter and child are sitting facing each other; nearby there are some puppets.*
Experimenter: 'How about playing with the puppets?'
Context A: *The experimenter looks at the child waiting.*
Context B: *The experimenter is writing and doesn't pay attention to the child.*
Alternative interpretations:
(a) Proposal to play together, the child starts playing with the experimenter.
(b) Request to play alone, the child starts playing alone.

(10) *Child and experimenter sit near the table, nearby there are some toy blocks.*
Experimenter: 'It's time to build something, there are the blocks'
Context B: *Experimenter starts to read a book.*
Context A: *Experimenter gets up and sits down on the carpet, looking at the child.*
Alternative interpretations:
(b) Request to play alone, the child starts playing alone.
(a) Proposal to play together, the child starts playing with the experimenter.

A.2.3. Status

(11) Experimenter: '*This is Mark [a puppet]. He's playing with his cars, he likes it very much and he plays for hours and hours and cares for nobody else*'.
Context A: *Mark's mother arrives (a puppet is introduced) saying: 'Stop playing, it's dinner time!'*
Context B: *Mark's little sister arrives (a puppet is introduced) saying: 'Stop playing, it's dinner time!'*
Experimenter: 'Will Mark stop playing or not?'
Alternative interpretations:
(a) Order, the child says that Mark will stop playing
(b) Request, the child says that Mark will not stop playing.

(12) Experimenter: 'This is Ann (a puppet)'
Context A: *Ann's friend arrives (a puppet is introduced) saying 'Would you like to do a drawing?'*
Context B: *Ann's mother arrives (a puppet is introduced) saying 'Would you like to do a drawing?'*
Alternative interpretations:
(a) Request, the child says that Ann will either answer yes or no.
(b) Order, the child says that Ann will do a drawing.

References

Ackerman, Brian P., 1978. Children's understanding of speech acts in unconventional directive frames. Child Development 49, 311–318.

Airenti, Gabriella, Bara, Bruno G., Colombetti, Marco, 1993a. Conversation and behavior games in the pragmatics of dialogue. Cognitive Science 17, 197–256.

Airenti, Gabriella, Bara, Bruno G., Colombetti, Marco, 1993b. Failures, exploitations and deceits in communication. Journal of Pragmatics 20, 303–326.

Austin, John L., 1962. How to do Things with Words. Oxford University Press, London. (second ed. revised by Ormson J.O., Sbisà M., Oxford University Press, London, 1975).

Bara, Bruno G., 1995. Cognitive Science: A Developmental Approach to the Simulation of the Mind. Lawrence Erlbaum Associates, Hillsdale, NJ.

Bara, Bruno G., Bosco, Francesca M., Bucciarelli, Monica, 1999. Developmental pragmatics in normal and abnormal children. Brain and Language 68, 507–528.

Bara, Bruno G., Bucciarelli, Monica, 1998. Discourse in context: The emergence of pragmatic competence. In: Quelhas, A.C., Pereira, F. (Eds.), Cognition and Context. Istituto Superior de Psicologia Aplicada, Lisbon, pp. 317–345.

Bara, Bruno G., Bucciarelli, Monica, Colle, Livia, 2001. Communicative abilities in autism: evidence for attentional deficits. Brain and Language 77, 216–240.

Bucciarelli, Monica, Colle, Livia, Bara, Bruno G., 2003. How children comprehend speech acts and communicative gestures. Journal of Pragmatics 35, 207–241.

Clark, Herbert H. (Ed.), 1992. Arenas of Language Use. The University of Chicago Press, Chicago/London.

Clark, Herbert H., Carlson, Thomas B., 1981. Context for Comprehension. In: Long, J., Baddeley, A. (Eds.), Attention and Performance, 9. Erlbaum, Hillsdale, NJ, pp. 313–330. [reprinted in Clark, H.H. (Ed.), 1992: 60–77].

Clark, Herbert H., Marshall, Catherine R., 1992. Definite Reference and Mutual Knowledge. In: Clark, H.H. (Ed.), Arenas of Language Use. The University of Chicago Press, Chicago/London, pp. 9–39.

Dooling, James D., 1972. Some context effects in the speeded comprehension of sentences. Journal of Experimental Psychology 93, 56–62.

Ebeling, Karen S., Gelman, Susan, 1994. Children's use of context in interpreting "big" and "little". Child Development 65, 1178–1192.

Ervin-Tripp, Susan, 1977. Wait for me, roller skate. In: Ervin-Tripp, S., Mitchell-Kernan, C. (Eds.), Child Discourse. Academic Press, New York, pp. 165–188.

Garton, Alison, Pratt, Chris, 1990. Children's pragmatic judgements of direct and indirect requests. First Language 10, 51–59.

Gibbs, Raymond W., 1986. What makes some indirect speech acts conventional? Journal of Memory and Language 25, 181–176

Gibbs, Raymond W., 1994. The Poetics of mind: Figurative Thought, Language and Understanding. Cambridge University Press, Cambridge.

Grice, Paul, 1957. Meaning. The Philosophical Review 67, 377–388.

Grice, Paul, 1975. Logic and conversation: the William James lectures, II. In: Cole, P., Morgan, J.L. (Eds.), Syntax and Semantics 3: Speech Acts. Academic Press, Cambridge, pp. 41–58.

Grice, H.P., 1989. Studies in the Way of Words. Harvard University Press, Cambridge/London.

Marslen-Wilson, William D., Welsh, Alan, 1978. Processing interactions and lexical access during word recognition in continuous speech. Cognitive Psychology 10, 29–63.

Martlew, Margaret, Connolly, Kevin, McCleod, Christine, 1978. Language use, role and context in five-year-olds. Journal of Child Language 5, 81–99.

Pollack, Martha E., 1990. Plans as complex mental attitudes. In: Cohen, P.R., Morgan, J., Pollack, M.E. (Eds.), Intentions in Communication. MIT Press, Cambridge, MA, pp. 77–103.

Récanati, François, 1995. The alleged priority of literal interpretation. Cognitive Science 19, 207–232.

Reeder, Kenneth, 1980. The emergence of illocutionary skills. Journal of Child Language 7, 13–28.

Reeder, Kenneth, 1983. Classifications of children's speech acts: a consumer's guide. Journal of Pragmatics 7, 679–694.

Reeder, Kenneth, Shapiro, Jon, 1993. Relationships between early literate experience and knowledge and children's linguistic pragmatic strategies. Journal of Pragmatics 19, 1–22.

Reeder, Kenneth, Wakefield, Jane, 1987. The development of young children's speech act comprehension: how much discourse is necessary? Applied Psycholinguistics 8, 1–18.

Searle, John R., 1969. Speech Acts: An Essay in the Philosophy of Language. Cambridge University Press, London.

Searle, John R., 1975. Indirect speech acts. In: Cole, P., Morgan, J.L. (Eds.), Syntax and Semantics, Vol. 3: Speech Acts. Academic Press, New York, pp. 59–82.

Shatz, Marilyn, 1978. On the development of communicative understanding: an early strategy for interpreting and responding to messages. Cognitive Psychology 10, 271–301.

Sinclair, John, Coulthard, Malcolm, 1992. Towards an analysis of discourse. In: Coulthard, M. (Ed.), Advances in Spoken Discourse Analysis. Routledge, London.

Sonnenschien, Susan, 1988. The development of referential communication: speaking to different listeners. Child Development 59, 694–702.
Sperber, Dan, Wilson, Deirdre, 1986. Relevance. Blackwell, Oxford.
Wittgenstein, Ludwig, 1961. Tractatus Logico-Philosophicus. Trans. by Pears, D.F., McGuinnes, B.F., Routledge & Kegan Paul, London. (Logisch-Philosophische Abhandlung, "Annalen der Naturphilosophie", XIV, 1921).

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