Dialogue Analysis:
Units, relations and strategies beyond the sentence

Contributions in honour of
Sorin Stati's 65th birthday

Edited by
Edda Weigand

In collaboration with Eckhard Hauenherm

Sonderdruck
aus Beiträge zur Dialogforschung
Band 13

Max Niemeyer Verlag
Tübingen 1997
Gerd Fritz

Coreference in Dialogue

1. Reference and coreference — the traditional picture and recent developments
2. Research on (co)reference in discourse — some areas of progress
   2.1 Theories of reference
   2.2 Theories of coherence
   2.3 Empirical work on reference and coreference
3. Interaction of (co)reference with other aspects of dialogue
   3.1 Reference and the function of linguistic utterances
   3.2 Reference and topic-management
   3.3 Reference and communicative principles
4. Non-referential uses and modal profile
   4.1 Continuity without coreference in hypothetical talk —
      Pronouns as variables and a generic use of definite descriptions
   4.2 Reference and coreference in a make-belief world
5. Concluding remarks

Notes
References

1. Reference and coreference — the traditional picture and recent developments

Since the early days of discourse analysis coreference has always been considered a major factor in the formation of texts and dialogues. The repetition of nominal elements and the anaphoric use of pronouns in successive sentences is a fundamental cohesive pattern which ties sentences together and contributes to the coherence of sequences. “La cohérence transphrastique trouve dans la pronominalisation un des procédés les plus efficaces” (Stati 1990, 160). The basic structural pattern on which linguists focused their interest in the early 1970s is captured by the following examples:

(1) A man entered the house. After closing the door, the man sat down. He was tired.
(2) Peter
   The man entered the house. He was tired.
   He

In languages like English or German, which have an indefinite article, a bit of discourse can, for example, be opened by a sentence with an indefinite noun phrase in subject position. It can be continued by successively adding a sentence with a definite
noun phrase and then one with an anaphoric pronoun in their respective subject positions. One may generally also use a proper name in the opening sentence, whereas the use of a definite noun phrase or a pronoun requires special conditions. This early model is basically correct, as far as it goes. But it is neither flexible enough to cover all the relevant facts — e.g. pronouns as variables or so-called referential uses of definite descriptions —, nor does it allow an explanation of the relevant facts. These limitations are mainly due to a restriction to structural properties of the sentences involved, that is to say to grammatical and lexical properties. And, of course, most of this work concentrated on monological sequences.

In the last 15 years or so there has been considerable progress in the field. As far as I can see this progress can mainly be attributed to three developments:

- Firstly, elements of a genuine theory of reference, mainly developed by philosophers of language, have been taken up by linguists and other students of reference.
- Secondly, we have seen the development of more sophisticated theories of coherence.
- Thirdly, there has been much relevant empirical work in linguistics, sociology, psychology and natural language processing, mainly on the strategies for the resolution of anaphora and for the choice of adequate referring expressions.

Maybe the decisive factor of progress was a change of perspective: Reference and coreference were no longer analysed in terms of linguistic structures alone but in terms of communicative tasks to be accomplished by using referring expressions. In this perspective, the basic questions would be: How do speakers introduce objects of talk into their shared universe of discourse, how do they keep track of such objects and how is this referential activity connected to other aspects of discourse. From this point of view, the analysis of dialogue becomes particularly interesting for several reasons, of which I shall just mention three:

(i) In analysing problems of reference in dialogue we have to explicitly take into account the interlocking perspectives of speaker and hearer and their respective states of knowledge, including their mutual knowledge. This aspect was stressed by researchers in the tradition of conversation analysis (cf. Schegloff 1972) and also by linguists and psychologists (cf. Fritz 1982, 149ff., Clark/Wilkes-Gibbs 1986).

(ii) In face-to-face dialogue we have all kinds of ad-hoc resources of reference (e.g. the thing over there or what you said just now) and we also find devices for on-line reference clarification, like the cooperative search for the name of an intended referent in example (3):
(3) A: You remember the English lecturer we talked to in Glasgow?
B: Jimmy Burnett
A: No, Jimmy is in the German Department
B: You mean Dr. McAllister?
A: Yes Dr. McAllister. I met him in London the other day

(iii) Many objects of reference are actually created in the course of dialogue. Let us imagine the members of a language department decide to reform their teaching programme. At some point in the discussion someone suggests the introduction of a new study course. Soon people start referring to “the new study course”. Although it is not yet born, it is already acquiring an identity of its own. By referring to it again and again and by suggesting future properties of the course, the planning committee anchor the new object in their own web of beliefs. After a while they might even decide to give it a name, let’s say “Text Production and Media”. What we have in such a case is the emergence of a new object in dialogue.

2. Research on (co)reference in discourse — some areas of progress

After having given some background to the main points of this paper, I shall now sketch some results from the areas of progress I mentioned before, without, however, going into the history of the field in any detail.

2.1 Theories of reference

Reference has been a major topic in philosophy at least since Frege and Russell. These logicians inspired much of the work on reference which philosophers of language did from the 1950s onwards (Quine, Geach, Strawson, just to mention three prominent names). In his 1964 paper on “Identifying reference and truth-values” Strawson focussed on the importance of identifying knowledge, an aspect which was later stressed by researchers in conversation analysis and in artificial intelligence. Another Oxford philosopher, Peter Geach showed that there are different uses of pronouns, at least one of which is not referential in the strict sense at all (Geach 1962). Later on Donnellan (1966) drew attention to different uses of definite descriptions, so-called “attributive” and “referential” uses. A long discussion on the semantic properties of proper names was initiated by Kripke, amongst others (Kripke 1972, Dummett 1973). For some years now genericity has been a focus of interest in semantics (cf. Krifka 1988). Useful recent work in the tradition of formal semantics includes studies in Discourse Representation Theory (e.g. Kamp 1985, Asher 1993). An important insight in philosophical theories of reference was the “discovery” of speaker’s reference as opposed to semantic reference. This concept was foreshadowed in Strawson’s and Donnellan’s work and
was made the foundation of a theory of reference in Searle (1969). It is this type of
type of theory of reference in particular which inspired work in dialogue analysis when, from
the late 1970s onwards, linguists and other researchers in the field of reference and
coreference increasingly availed themselves of the ideas developed in philosophy.¹

2.2 Theories of coherence

As for theories of coherence, there are two basic ideas which are shared by many pres-
ent-day theorists. The first idea is: Coherence is primarily a matter of language use.
Only in a derivative sense is it a matter of the structure of linguistic expressions like
sentences and noun phrases. This idea took some time in gaining ground in the 1970s,
but it is fairly well entrenched today. The second idea is: There are different organizing
principles for discourse, which speakers and hearers follow to build and to grasp coher-
ent sequences. If we want to understand the problem of coherence we must understand
these organizing principles and their modes of interaction. The following is a short list
of basic organizing principles for dialogue:²

(4) (a) linguistic acts and their local and global sequencing patterns
    (b) propositional connections between linguistic acts
    (c) principles of topic management
    (d) the dynamics of knowledge states and knowledge constellations (e.g. the
growth of mutual knowledge, inference-making)
    (e) communicative principles (e.g. relevance, comprehensibility, precision,
originality, politeness)
    (f) linguistic rules (syntactic, lexical and phonological) for the implementation of
these principles in individual languages

In this kind of framework problems of reference and coreference are linked to all the
organizing principles on the list.

2.3 Empirical work on reference and coreference

Finally, as for empirical work, there has been a lot of research especially on resolution
of anaphora in psychology, artificial intelligence and comprehensibility research. I only
mention Hobbs (1979), Tyler/Marslen-Wilson (1982) and Pause (1984) — there are
dozens of papers on this topic. The main focus in this line of research is the question:
How do listeners find out what anaphorical pronouns refer to in cases like (5)?

(5) John can open Bill's safe. He knows the combination.
In general terms, the answer to this question is the following: Hearer use different kinds of cues from different aspects of discourse. They use syntactical and lexical cues, they use the principle of topic continuity, they use cues from sequencing patterns (the second sentence can be understood as an explanation of the fact presented by the first sentence), they use mutual knowledge of the participants (e.g. stereotypical knowledge about safes and people, so-called “frame knowledge”: We know that safes have combinations and that only their owners should know them); furthermore cues may be taken from the special knowledge acquired during the actual discourse and so on. Now this is exactly the kind of result one would expect if one had the kind of theory I sketched before, where different organizing principles interact.

In the same traditions we find a smaller amount of work on the choice of referring expressions in discourse. Some of this work is summarized and documented in Grosz/Joshi/Weinstein (1995). In linguistics recent work includes Fox (1987) which I shall refer to in the next paragraph.

3. Interaction of (co)reference with other aspects of dialogue

After having outlined some of the areas of progress in the field of (co)reference, I shall spend the rest of this paper on two groups of examples and some theoretical problems they pose. The examples of the first group are meant to show some connections between reference/coreference and several of the other aspects of dialogue mentioned above, viz the type of linguistic acts performed, topic-management, and the observance of communicative principles. The examples of the second group, which concern hypothetical and fictional talk, are intended to show how continuity of reference is connected to continuity of what one might call modal profile. So I now start off with examples where the business of referring interacts with the functional aspect of dialogue.

3.1 Reference and the function of linguistic utterances

In order to show the interaction of referential aspect and functional (or illocutionary) aspect I shall give you a very simple example. In (6) a mother complains about her daughter’s dress habits, and a second mother replies to this complaint:

(6) A: Anna has taken to wearing skirts lately
    B: All girls of her group at school have given up wearing jeans

Now this bit of dialogue looks as if all there was to be said about it concerned the propositional level. The first utterance is a statement about one particular girl. And the second utterance is a closely related general statement about a group of which the girl mentioned in the first utterance is a member. So part of the coherence of this sequence
is built on relationships of reference and predication. But there is more to it than that. Generalising on a particular statement is a distinct type of linguistic act in its own right with quite interesting functional and sequential properties. In reacting to a statement by generalising in the above fashion, one implicitly accepts the proposition, but one does not leave it at that. One lifts the topic to a higher level, so to speak. In doing so, a speaker may for instance show the previous speaker that there is no need to worry about a fact which is not an individual problem but a general tendency in a certain age group. So what emerges is that there is quite a subtle interaction between the propositional and the functional levels, and it is this interaction — together with a certain amount of mutual knowledge — which produces the coherence of this dialogue sequence. Furthermore these two utterances could be the first steps in the development of a distinct topic, say “clothing problems with school girls”. There is also the converse sequence of general and particular statement, like in (7):

(7) A: All small girls want to wear skirts these days
   B: My daughter doesn’t

Here we have a typical case of contradiction by counterexample. There are many more interesting aspects of sequences with general and particular statements. But I shall leave the topic here.

A second type of close relation between reference and illocution is reported by Barbara Fox in her book on “Discourse structure and anaphora”. She found that in a number of cases “a referent was mentioned in a statement from one participant and was then mentioned again in a disagreement with that statement from the other participant” (Fox 1987, 62). The following example is taken from her data:

(8) A1: Those were Alex’s tanks weren’t they?
   B1: Pardon me?
   A2: Weren’t / didn’ they belong to Alex?
   B2: No / Alex has no tanks / Alex is trying to buy my tank

In B’s second utterance he could have used an anaphoric pronoun to refer to Alex. Instead, he repeats the proper name. This kind of use is probably due to the contrastive emphasis one uses in disagreeing with a statement.

3.2 Reference and topic-management

It is well known that there is an especially close connection between reference and topic management (cf. Givón 1983). As I mentioned at the beginning of this paper, new topics are often introduced by the use of full noun phrases like descriptions and proper
names, whereas continuation of topic can be signalled by the use of anaphoric pronouns. Equally, the return to the main topic after a side sequence is often signalled by means of a full noun phrase. These are quite familiar facts. It is however remarkable that the use of pronouns is not as restricted as one tends to believe. This is another result of the work done by Barbara Fox. She found that in telephone conversations speakers sometimes return to the main topic after quite a long intermediate sequence by using a pronoun. (In artificial intelligence these cases of long-distance coreference with pronouns are called return pops.) This practice presupposes that speakers have a very good feeling for the state of the dialogue and the development of the main topic.

3.3 Reference and communicative principles

The third kind of connection between reference and other aspects of dialogue concerns reference and communicative principles. In the following fictitious example the use of two definite descriptions simultaneously serves the aims of reference and the principles of originality and comprehensibility. During a meal at home a husband wants to talk to his wife about the fat lady next door and at the same time he wants to accomplish two extra tasks: He wants to say something funny and he does not want his small son to understand who is being talked about. So what he does is use a description like in (9A). And his wife may refer to the same person in replying with (9B):

(9) A: The model next door is wearing hot pants again
    B: Our beauty queen is getting more daring every day

What we have here is a kind of ironic use of descriptions which at the same time calculates the knowledge of a small child. Generally speaking, definite descriptions like the model next door are the type of referring expression that can be used most extensively for special purposes by giving all kinds of extras on top of mere identification. Their use can be finely tuned to the knowledge of the participants, to the state of the dialogue, to the function of the utterance at hand and to all kinds of principles, from precision to elegant variation. And of course they facilitate long-distance coreference as in the title I mentioned at the beginning of this paper.

My second example in this section concerns two related communication principles, the principle of comprehensibility and its close relative, the hearer-relative principle of secure understanding. In the following sequence of authentic dialogue the use of referring expressions is partly geared towards the avoidance of miscomprehension. In this dialogue we find a lady doctor examining an elderly patient, asking her about the hearing problems she has with one ear. In line 119 the patient identifies her right ear rather elaborately by using a deictic (da) plus a full noun phrase (including a second deictic
in a construction of left dislocation Da des Ohr da, des and goes on to describe her complaints with this ear. In line 122 the doctor tries to make sure that she has got the reference correct by saying Des rechte Ohr 'your right ear', which the patient confirms. In line 123 the patient continues talking about the medical treatment of her ear by using the pronoun es in its reduced form ma-s, a Southern German dialect form for mir es ('me it'). In line 125 the doctor has another question concerning the ear. At this point she could easily have used a pronoun. But to make sure the elderly lady really understands what she is referring to, she uses the pronoun des and adds the full noun phrase des Ohr in a syntactic construction of right dislocation (und des is immer ver- stopft, des Ohr 'and it is always blocked, your ear'). Again the use of the full noun phrase on the part of the doctor is a security measure prompted by the patient's hearing problem.

(10)119 Doctor Augendruck. Hm. Und Sie hören auf einem Ohr nicht so gut?  
Patient nein Da des Ohr da, des

120 Doctor Seit wann?  

121 Doctor Aber Sie sagen, seit a paar Tagen, ham Sie des früher scho mal ghabt?  
Patient

122 Doctor Des rechte Ohr  
Patient Immer. Jedes Jahr, ja geh ich zu Ohrenarzt, vielleicht zwei mal

123 Patient oder drei mal. Der tut mas na ausblasen. Un na tut a mit a/ mit a sch/  
124 Patient (Creame), mit a schöne (Creame ) tut a ma nei und tut des / und na

125 Doctor Und des is immer verstopft des Ohr? Aber hören täts  
Patient geht des wieder. Ja, ja

126 Doctor gut, wenns frei wäre? ... Also des Ohr an sich is ned schwerhörig, sondern  
Patient Ja

127 Doctor es is immer wieder verstopft? Sie sollen heute übrigens noch  
Patient Verstopft, ja.

4. Non-referential uses and modal profile

The second group of examples I should like to discuss concerns cases where there is something like coreference going on but where there is either no reference to particular objects at all or where the objects referred to have some special mode of existence.
4.1 Continuity without coreference in hypothetical talk —
  Pronouns as variables and a generic use of definite descriptions

The most prominent counterexample to a simple-minded coreferential analysis comes from logic and formal semantics, namely the use of pronouns in a way similar to the use of variables in predicate logic. (11) is a extended dialogical example for this kind of use:

(11) A1: Anyone who tries to do this will fail
   B1: He will in fact fail quite abominably
   A2: He will try and try and try
   B2: And he will become more frustrated every day
   A3: Poor fellow, but he should have known better in the first place

Here the use of the pronoun in B1 cannot be coreferential in the usual sense because there is no definite reference made in A's preceding utterance. Now the interesting thing from the point of view of suprasegmental analysis is that this kind of non-referential connection can be continued over a sequence of utterances. By the time we get to A3, we are beginning to feel sorry for the poor fellow. But there is no need to do so, because there is no individual to feel sorry about. A and B are still talking about what would happen to someone who would be foolish enough to attempt the impossible. They are talking in the hypothetical mode. It is just the deceptive flexibility of the use of pronouns that makes us forget that there is no definite reference in this case at all. What the use of the pronoun really suggests is that if we pick out one particular individual to verify our hypothesis we have to stick to this particular person. So the pronoun signals continuity, not coreference.

In my second example we find another type of classical referring expression not being used in a straightforward referential fashion. This time we are dealing with definite descriptions again. The example is taken from the transcription of an information talk in an office of the public health insurance. The topic of this section of talk is the procedure for the reimbursement of doctors' bills in cases where you have a private insurance on top of your public health insurance.4

(12) A1: basically we are the insurance who pays first / we are the public insurance
       and therefore we are entitled to have the original doctor's bills
   B1: So you would not pay my money back if I sent my original doctor's bill first
       to my private insurance?
   A2: Oh yes we would still pay the money back. In this case we would have to
       make do with the duplicate
   B2: xxx (utterance not comprehensible)
A4: because the original is already gone /// but as a rule we ought to have the original

The dialogue goes on like this for some utterances. In this dialogue some of the definite descriptions are obviously not being used referentially. One can show this by applying a test. If a use is referential, it must make sense to ask “Which original?” or “Which duplicate?” But the outcome of this test is negative. The participants of this dialogue are not talking about particular doctors’ bills but about what has to be done with any doctor’s bill. So what we seem to have here is a kind of generic use of the definite descriptions, which is linked to the hypothetical mode we use in talking about regulations. Again, we find continuity without strict coreference. The essential thing is that in order to secure this continuity, speakers have to remain in the hypothetical mode. In other words, the coherence of this dialogue is partly due to the continuity in modal profile.

4.2 Reference and coreference in a make-belief world

My final example is intended to show that things are not always as simple as that. It shows that even young speakers are virtuosos at crossing modal barriers. In the dialogue given under number (13) we find two 9 year-old girls playing with marbles. At the beginning of the sequence they are examining the different kinds of marbles they own. However, they soon get bored with this game and decide to to play something different. In utterance T2 Theresa suggests they play that they are thieves, and in T3 she modifies her suggestion to playing thieves as husband and wife. A second later, in T4, she says *Diese Dukaten, herrlich, nicht?* ‘These ducats, aren’t they wonderful’. So suddenly, with only a rather inexplicit preparation (*sei nicht so goldgierig* ‘don’t be so greedy of gold’) she refers to some golden coins (*Dukaten*). In T5 the transcriptor considers it necessary to explain what she is referring to, namely to some marbles. Now this commentary is of course not quite correct. She is not referring to marbles, but to ducats. By calling them ducats in T4 she has converted them from everyday marbles to game ducats. And thats what they remain for the rest of this sequence, where the second girl soon joins in the new game. An interesting passage — which is not on the hand-out — follows a few seconds later, when Anke asks Theresa *Where did you get all these things from?* And Theresa answers: *From my brother.* In this question-answer pair the girls jump out of the game dialogue into a real information-giving sequence, only to return straight away to their game after this short interruption. Some minutes later they modify the game again. Theresa is still playing a thief who is counting his ducats. But the other girl is now a policeman. He looks at a ducat and says:
Coreference in Dialogue

What is that? Oh, it's just a marble. That is of course quite a sophisticated move, which plays upon the double existence of the marble-ducat.

(13) T1: .. So (fertig), ich mach jetzt weiter! (mit Murmeluntersuchen) Uff! (stöhnt) Hast du noch Lust?
A1: Nää-äähn (= nein)! // Komm wir packen alles ein!
T2: So, nein wir spielen Diebe!
A2: Ja! Diebe is’n guter Einfall! Ach ... (wühlt in den Murmeln)
T3: Solln wir Mann und Frau sein? Eß erst mal, Schatz! (T spielt die Frau)
A3: (sagt etwas)
T4: Sei nich so goldgierig, wenn die Polizei kommt bist’e aufgeschnappt! // ach!
(sentimental-schweßgindend) Diese Dukaten, herrlich, nicht? (= nicht wahr)
T5: (schweßgind-schmachtend) Diese Dukaten! (= Murmeln) / Guck mal,
Darling schenke du mir welche?
A5: Ja!
T6: Ich möchte .../ öhm ich möchte mir zuerst welche aussuchen!
A6: Die dicksten Dukaten sind am meisten wert:
T7: Ach lm lm (affektiertes Getue), aber die kleinsten auch!
A7: (sagt etwas) haa //
T8: Guck mal! / davon / eine (Murmel), da haben wir noch eine / haach
überrascht) da! /
A8: Wo?
T9: Und dann haben wir auch eine / herrlich
A9: Wunderbar! Und weißt du was?
T10: Guck mal: /
A10: Hmm! (= gut/herrlich)
T11: (schmachtend) Schatz! Diese Dukaten! Guckmal wie das glitzert!

Now what is interesting about this passage is that the transition from plain reality to game reality is at least partly effected by a referential link. By calling the marbles ducats, which is a kind of baptism, Theresa introduces the ducat-game. The accessibility of the make-belief world rests on the girls’ mutual knowledge that the game ducats are identical to the real world marbles. What is especially remarkable is that the children manage the transition from reality to game and back again without any extra commentary. So this example shows that the continuity of modal profile is not a strict requirement in naturally occurring dialogue. If there is enough mutual knowledge as to what is going on, just about anything goes.

This does of course not show that there is no room for serious research on the constraints on the kinds of transitions that are allowed. It does however show that the focus on constraints has to be counterbalanced by the focus on speakers’ resources for managing highly sophisticated modal transitions.
5. Concluding remarks

I should like to conclude this paper by summarizing the main points:

1. Singular identifying reference to real world objects and coreference to such objects mentioned earlier in the discourse certainly is a prototypical example of the general activity of talking about things, if not the prototype of this activity. When we take a closer look at the overall practice, however, it turns out to be just one member of a ramified family of action patterns that could be subsumed under the description "talking about the same thing(s) and kind(s) of thing(s)". We have to take into consideration patterns like introducing new objects (new theoretical entities, fictional objects), introducing (and cross-reference to) hypothetical objects, reference to objects of doubtful standing like witches and ufos (where cross-reference involves "intentional identity"; cf. Geach 1972), reference to abstract objects, reference to kinds of objects, indefinite reference, plural reference, reference by means of metaphorical uses etc.

2. Different kinds of talking about the same thing (and thereby creating continuity in discourse) are closely connected to specific forms of discourse/dialogue and the principles of organization that form the basis of these forms of discourse/dialogue. Fictional narrative, for example, is partly founded on the patterns for introducing fictional objects. The fact that linguistically reference to fictional objects works fundamentally the same way as reference to real world objects should not obscure the fact that they are distinct act patterns that follow different pragmatical rules. Problem-solving and planning dialogues often involve the introduction of hypothetical objects which have to be dealt with as a part of emergency planning. (A: What happens if there is a night watchman on the premises? B: We shall have to keep him quiet.) Dialogues of seeking and finding often proceed from the specification of the properties a candidate object should possess and end up by identifying an adequate object. (A: We have to find a new president. B: He should be at least six foot tall and good-looking. C: And he should know the rules of the society. ...)

3. Transitions from one type of dialogue to the other often involve a transition in the way one talks about things and a transition with respect to the kinds of things one talks about (e.g. from ufos to Mercedes cars). There is so far not much empirical research on the strategies and resources speakers use to manage these transitions. The main resource is certainly mutual knowledge, which has to be kept up to date to facilitate transitions. So the topic of talking about the same thing is closely connected to the topic of the dynamics of mutual knowledge.

4. Finally, these questions are not only theoretically exciting but they are also important from the point of view of possible applications. Both in natural language pro-
cessing and in comprehensibility research — just to name two fields — it is es-ential to get a better idea of what strategies and resources speakers and hearers use in tracking what is being talked about.

Notes

1) It is remarkable that the authors of a book like "Cohesion in English" (Halliday/Hasan 1976) should not have taken notice of what was going on contemporaneously in the theory of reference. As a consequence of this neglect their treatment of problems of reference and coreference is a weak point in their otherwise valuable book.

2) A more detailed description of these organizing principles and their theoretical background can be found in Fritz (1994).


4) The text is an English translation of a transcription given in "Texte gesprochener deutscher Standardsprache III: Alltagsgespräche" (1975, 136ff.).

5) The following transcription is taken from Wagner (1975, 186ff.). A short discussion of this dialogue is given in my book on coherence (Fritz 1982, 174ff.).

References

Asher, N. (1993), Reference to Abstract Objects in Discourse, Dordrecht/Boston/London.
