

# COHERENCE IN SPONTANEOUS TEXT

# TYPOLOGICAL STUDIES IN LANGUAGE (TSL)

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## Volume 31

Morton Ann Gernsbacher and T. Givón (eds)

*Coherence in Spontaneous Text*

# COHERENCE IN SPONTANEOUS TEXT

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# Introduction

## Coherence as a mental entity

What does it mean for a text to be “coherent”? The contributors to this volume have struggled with this fundamental, but perplexing, question. Their answers are provocative, insightful, and surprising in their overall coherence. The theme that binds the collection of papers in this volume is, simply put, that coherence is a mental phenomenon. Coherence is not an inherent property of a written or spoken text. Readers or listeners can indeed judge with high agreement that one text is more coherent than another. But neither the words on the page nor the words in the speech stream *of themselves* confer coherence. And although a less coherent text impedes comprehension, neither the printed sentences nor the spoken utterances cause those impediments.

Coherence is a property of what emerges during speech production and comprehension — the mentally represented text, and in particular the mental processes that partake in constructing that mental representation. A coherently produced text — spoken or written — allows the “receiver” (listener or reader) to form roughly the same text-representation as the “sender” (writer or speaker) had in mind. To the extent that the sender’s mental representation was coherent to begin with, and to the extent that the receiver’s mental representation matched that of the sender’s, the text is coherent.

In producing and comprehending a text, be it spoken or written, the interlocutors collaborate towards coherence, negotiating for the common ground of shared topicality, reference, and thematic structure — thus toward a similar mental representation. During conversation, the negotiation takes place collaboratively between two (or more) active participants. During writing, revision and editing, the negotiation occurs cognitively between the writer’s own mental representation and his mental representation of what he/she assumes the reader knows. Conversation — spontaneous face-to-face communication — is thus the primary evolutionary

template that shaped the cognitive mechanisms of text production and comprehension. Non-conversational text merely piggybacks on these fundamentally interactive mechanisms. This view of coherence emphasizes the speakers' and writers' ongoing effort to achieve coherence with their listeners or readers. The measurable litmus test for success is then the readers' and listeners' coherent comprehension. Coherence thus emerges not in the text, but in the two collaborating minds.

**Anne Anderson** presents a striking demonstration of how participants in conversation negotiate for coherence in a laboratory problem-solving task. Her subjects draw on common landmarks and negotiated utterances to achieve their goals. Anderson also demonstrates the developmental course of negotiation. Her data strongly support the hypothesis that negotiating for coherence during discourse is a skill that must be acquired.

**Jennifer Coates** tackles the questions of the Wittgensteinian extreme bounds of coherence — tautology and contradiction. The first represents maximal coherence to the point of manifest redundancy; the second represents minimal coherence. Working from conversational texts, Coates shows how speakers negotiate instances of both tautology and contradiction, so that what — from a purely logical perspective — could be either redundant or incoherent acquires communicative coherence during the process of negotiation.

**T. Givón** frames the main theme of the volume, that coherence is fundamentally not a property of the text but rather of the mind that produces or interprets the text. Cognitively, coherence is constructed with the aid of both domain-specific (lexical) knowledge and grammatical processing cues. Both processes contribute to the construction of both local and global coherence links.

**Charles Goodwin** demonstrates the flexible, negotiable nature of the coherence that emerges during conversation, where both local and global construction of what is “the topic” contributes to specific coherent interpretations of the communication.

**Walter Kintsch** explores the contrast between knowledge-driven and grammar-driven processes of building coherence, suggesting that the two mechanisms operate in parallel as “strong” vs. “weak” text-comprehension strategies, respectively.

**Tony Sanford** and **Linda Moxey** argue that coherence must be “in the head.” They illustrate this with texts that are stylistically cohesive but communicatively incoherent. Their subjects, in comprehension tasks, fail to comprehend the meaning intended by the texts’ authors because they overly-activate their associated knowledge.

**Tom Trabasso**, **Soyoung Suh** and **Paula Payton** investigate the emergence of global coherence links during comprehension. Their laboratory experiments outline the mental representations that must be activated in readers’ mind for successful comprehension.

**Matthew Traxler** and **Morton Ann Gernsbacher** argue that writers also negotiate for coherence. During writing, negotiation for coherence is considerably more difficult because the writer’s or editor’s audiences are not available as active collaborators. Instead, the writer must envision — indeed imagine — the mental representation that the written texts would prompt in the reader’s mind. To the extent that the writer is successful in guessing the emerging text-representation in the reader’s mind, the written text will be judged by readers to be more coherent.

**Deanna Wilkes-Gibbs** presents both arguments for and laboratory demonstration of the way participants in conversation negotiate for coherence. Conversation participants engage in turn taking and question asking to establish common ground and mutual representation. Moreover, listeners’ memory representations are greatly affected by their assessment of common meaning as they converse.

Most of the papers in this volume were originally presented at the Symposium on Coherence in Spontaneous Text, held at the University of Oregon in the spring of 1992. We are indebted to the Institute of Cognitive and Decision Sciences at the University of Oregon, the Keck Foundation of Los Angeles, and the Shaolin-West Foundation of Durango, Colorado for their financial support; to Vonda Evans for logistic support on site; and to our

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# Negotiating coherence in dialogue\*

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## 1. Introduction

Researchers in different fields have offered rather varied definitions of coherence, from on the one hand the closely text-based definitions such as van Dijk (1977) “ .... a dialogue is coherent due to the assignment of the various utterance meanings to one macro-structural topic” or in similar vein, Graesser (1981) following on from Kintsch (1979) “coherence graphs are constructed on the basis of a simple coherence rule, connections are formed whenever two propositions share an argument”, to on the other hand those more concerned with issues of language processing, such as Hobbs (1979), or Edmondson (1981) who proposes that “ coherence is equated with the interpretability of a discourse”. Extending this kind of argument that it is the language processing by readers or listeners which should be our prime concern, Givón (this volume) proposes that:

“The coherence we are really after is not the coherence of the external text but rather the coherence of the mind that produce, store and retrieve the mental text. ... we study the coherence of external text as a useful heuristic in order to get insights about the coherence of mental text, and about the mind that produces it.”

Givón in his paper sets up a contrast between the **global coherence** tradition, which has been derived from psychologists’ research on well-edited written texts produced top-down with a fixed perspective, with global goals governing the selection of more local structures, and the **local coherence**

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tradition, which derives from the research of linguists and others who have studied spontaneous oral text, where there is local consistency but global inconsistency and where the text is produced in a bottom-up unplanned manner with flexible, shifting and negotiated perspectives.

There is also, however, an increasing body of psychological research on dialogue which is relevant to any discussion of coherence. The present paper attempts to add to this tradition. Many of these studies have examined situations where the speakers do have clear global goals, either because of the experimental tasks which they have been set in the laboratory or because of the particular naturally occurring discourses being studied such as telephoning directory enquiries (Clark and Schaeffer, 1987). The experimental tasks used have usually involved a variety of co-operative problem solving, either arranging Tangram figures (Clark and Wilkes-Gibbs, 1986; Schober and Clark, 1989; Wilkes-Gibbs and Clark, 1992), arranging photographs of New York (Isaacs and Clark, 1987), or playing a computerized maze game (Garrod and Anderson, 1987). The results of these studies have all tended to support what has come to be known as the 'interactionist' or 'collaborative' approach (Clark, 1985; Schober and Clark, 1989), which emphasizes how mutual understanding depends upon moment by moment interactions between speakers. Such collaborations between adult speakers have been shown to influence a whole range of features in the corresponding dialogues, for example, the information content of descriptions given by speakers, the amount of information provided, the use of definite and indefinite articles, and even the semantic interpretation of the words used. Clark and Wilkes-Gibbs (1986) have formulated a collaborative theory of reference making which states that when speakers make a reference, they try to establish with their partners the mutual belief that their partners have understood the reference to a criterion sufficient for current purposes. From studying many task-oriented dialogues they show that such collaborations involve both speakers and can take several turns to accomplish.

All of this research has shown fascinating examples of how effectively and sensitively adult speakers engage, sometimes over extended sequences, with their conversational partners to achieve 'mutual knowledge' (Clark and Marshall, 1981). The extracts from dialogues, for example in Isaacs and Clark (1987), and Schober and Clark (1989), show a variety of different forms of introductions and subsequent descriptions, being successfully interpreted by addressees, with changes in the length and content of

descriptions made over the course of single dialogues or across experimental trials in the light of shared experience on task or judgements about the expertise of the listener. But are such collaborations always successful? In the present paper we report an investigation of the process of negotiating coherence in adult and child dialogues. We aim to chart the development of the kind of interactive skills described above, to assess whether there is variability in the effectiveness with which speakers of various ages handle such negotiations, and to explore if the various linguistic forms chosen by speakers influence the success of such collaborations.

In this research we study a large number of comparable task-oriented dialogues from children and adults and examine the process of negotiating coherence in a known communicative context. We thus sacrifice the spontaneity of the dialogues studied by many linguists for the benefit of greater knowledge of at least some of the speakers' goals. As analysts we can be more confident in our mapping between what Givón terms the external and mental texts.

From the previous research on adult speakers, a suitable definition of coherence in dialogue then would be that the discourse was interpretable for **both** participants. One of the critical points in the communication process, therefore, is when **one** speaker wishes to introduce a new item for discussion. If this is not done felicitously the discourse may become uninterpretable to the listener.

The linguistic forms used by speakers to introduce new information in discourse has stimulated a considerable body of research in several disciplines, such as linguistics, philosophy, artificial intelligence and psychology. Much of this research has focussed on how the article system is deployed in discourse processing to capture assumptions made by speakers and listeners about the extent of the overlap between their respective knowledge states.

An influential account of how speakers' assumptions about mutual knowledge influences language use has come to be known as the 'mental model' approach. This focuses on the choice between definite and indefinite articles, suggesting that the use of an indefinite article signals the introduction of an entity not previously known to the listener and hence at this point the listener should **create** a new referent in her discourse model. The use of the definite article on the other hand signals that the entity is known (or readily inferable) and that a **retrieval** process should begin within the listener's current discourse model to find the appropriate antecedent (see for example, Webber, 1979; Johnson-Laird and Garnham, 1980; Sidner,

1983; Johnson-Laird, 1983; Kamp, 1984). Alternative views which have been put forward by such researchers as Löbner (1985), Ushie (1986), and Fraurud (1991), have also focussed on the article system but have offered different analyses of the forms and functions of definite and indefinite descriptions.

The mental model approaches (and their alternatives) assume that the speaker's choice of article at such points is the salient feature of this process of 'grounding' (Clark and Schaefer, 1987). Our alternative view is it is the use of certain **forms** of introduction: introductory questions, which is more important to overall communicative success. The use of introductory questions has been noted in spontaneous dialogues; Keenan and Schiefflin (1976) for example comment on how reluctant adult speakers are to discuss individuals or objects that cannot easily be identified or recognized by their hearer. To avoid doing so they say that speakers can introduce topics into the discourse with questions like "Do you remember the guy we met in Paris?" "You know those boots we tried on with the fur lining?" or "Do you see that chair over there?" Sacks and Schegloff (1979) also describe how adult speakers of English can describe an object or individual with rising intonation in a construction they term a 'try-marker'. The speaker leaves a short pause following such an introduction in which the listener can signal her understanding. If the listener does not provide some form of positive feedback the speaker continues with alternative try-marker constructions as the following example illustrates.

A: .....well I was the only one other than the uhm tch Fords? -  
       Uh Mrs. Holmes Ford? You know uh - the the cellist?

B: Oh yes. She's she's the cellist.

A: Yes ..... (Sacks and Schegloff, 1979)

Schegloff (1980) illustrates how speakers can use a device he terms a 'preliminary' to ensure that their contributions to a conversation are understandable for their listeners. Speakers introduce terms in preliminaries without using them to make reference to people, places or things, thus allowing the listeners to signal any comprehension problem before the speaker goes on to use the term in a question, statement or request. Schegloff claims that speakers use different forms in preliminaries depending on their assumptions about the listener's knowledge of the new referent: a 'telling' form if the speaker does not know about the referent to be mentioned, a question form such as "do you know", "do you remember" if the listener

is assumed to be familiar with the new topic. In Schegloff's illustrations drawn from various conversations, both forms appear to be effective in allowing communication to proceed smoothly.

We believe that in our task-oriented dialogues it is the use of introductory questions which will reliably elicit active collaboration from listeners of all ages, shown by previous research to be so important between adult speakers. In the present study we will compare the effects on communicative success of the speakers' choice of articles with the choice of different forms of introduction, question and non-question.

The map task, which will be the focus of this paper, was developed by Brown, Anderson, Yule and Shillcock (1984). The task involves one participant giving directions to another about a route to follow on a simple map. Although both participants have a copy of the basic map, there are some differences between the two maps which add to the referential problems confronting the subjects. This task was chosen following several years of research in schools working with many different types of communication tasks (see Brown, Anderson, Yule and Shillcock, 1984; Anderson and Lynch, 1988). The map task was found in these studies to be a most engaging and motivating task for pupils of a wide range of ages and abilities. The task is also one that can be used successfully with pairs of adult speakers.

In this paper the map-task dialogues will be used to explore how child and adult speakers negotiate coherence in one type of dialogue, the forms of language they use to do so, and the overall communicative success achieved as a result. A number of hypotheses are under test in this study. First, that the forms of introduction used have an impact on the success of the communication as a whole, and that this relationship is more important than the articles used by speakers. Second, that speakers of all ages vary considerably in the efforts in which they engage to ensure a mutually intelligible communication and that these differences are reflected in the choice of different forms of introduction.

## **2. Methods**

### **2.1. Subjects**

In the child study 33 pairs of subjects mean age 7;9, age range 7;5-8;7, 26 pairs of subjects mean age 10;2, age range 9;6-10;8 and 26 pairs of sub-

jects mean age 13;2, age range 12.8-13;7, were tested. The younger children attended two primary schools in Glasgow and the oldest group attended the secondary school which these primary schools feed. The children were of a range of academic abilities, and the majority of children at these schools are from middle income families. All monolingual children in each class who returned parental permission slips were tested with a familiar classmate as a partner. The children sat facing one another across a table with a low screen to prevent them seeing or pointing to their partner or their partner's copy of the maps. Approximately half the subjects in each age group were male, and half were female, and 90% of children were paired with a partner of the same sex. All testing is conducted in a quiet room in the children's school.

## 2.2. Materials

In the map task both subjects have copies of a simple schematic map. One member of the pair is randomly assigned to the role of instruction-giver (IG) and only her copy of the map has a route shown on it. Her task is to instruct her partner (instruction-follower) how to draw the route on his copy (IF). The children were instructed as follows.

### *Map Instructions to the instruction giver*

You and your partner have both got a map of the same place. Your map has got a route on it. It's the *only safe route* through all the dangers. Your partner hasn't got a route on her/his map. Your job is to describe the route to your partner so that (s)he can draw it on her/his map. You must describe it *exactly* because it's the *only safe route*. The maps have been drawn by different explorers, so they might not be quite the same; there might be some differences.

### *then to the instruction follower*

You and your partner have both got a map of the same place. Your partner's map has got a route on it. It's the *only safe route* through all the dangers. (S)he's going to tell you what the route is. Your job is to draw the route on your map. Listen carefully to what your partner says, and ask questions if there's anything you're not sure about. You must draw it *exactly* because it's the *only safe route*. The maps have been drawn by different explorers, so they might not be quite the same; there might be some differences. Do you understand what you're supposed to do?

Most landmark features are common to both versions of the map, but there are some differences between the two versions, with some features

shown only on the instruction-giver's map and some shown only on the instruction-follower's. Subjects are randomly assigned to the instruction-giving or the instruction-following role for Task 1. After the first task, the subjects are given a different pair of maps and are asked to swap roles, the instruction-giver with the route shown on her map in Task 1 becoming the instruction-follower in Task 2 and vice versa. There are four sets of pairs of maps and across subjects the order of presentation of the maps is balanced. The same materials and instructions are used for all ages of subjects.

The experimental paradigm involves video-taping and audio-taping performances which are then transcribed, coded and stored on a custom-built database which allows us to search the coded transcriptions for various features of interest. The data produced from this system are extremely rich, and many types of analysis are possible as described by Anderson, Garrod, Clark, Boyle and Mullin (1992).

One of the main advantages of the map task is that we can obtain an objective non-linguistic measure of how effectively any pair of speakers communicated by comparing the map route completed by the instruction-follower compared to the original route being described by the instruction-giver.

By placing a squared transparent grid showing the original route the instruction-giver was describing, over each completed map, the deviation between the route drawn by the instruction follower and the original can be tallied, by counting the number of cm. squares of difference between the two routes. High deviation scores where the completed route was very different from the original are taken as an indication of a relatively unsuccessful communication, low deviation scores where the two routes are very similar are taken to indicate more successful communications. Using the procedure described above, two judges assessed each child performance independently (interjudge agreement  $r = 0.98$ ), the mean of the two judges' deviation scores were used for the subsequent analyses. In a only a small minority of difficult cases (15 out of 170 performances), the judges' scores differed by more than 20 cm. squares, and these were then reassessed jointly until a consensus score was agreed. The deviation scores can then be compared. The mean scores for each age group are 182.16, 144.56 and 145.16 for the 7-, 9- and 13- year-olds respectively.

A two-way Analysis of Variance was performed on these data, with Age as a between subject independent variable, Task (Task 1 vs Task 2) as a within subject pair independent variable, and map deviation score as the

dependent variable. This showed Age and Task to be significant main effects ( $F_{2,75}=3.1$ ,  $p<.05$ , and  $F_{1,75}=6.89$ ,  $p<.01$ , respectively). Maps were drawn more accurately in Task 2. Newman-Keul's tests within the Age effect showed that 7-year-olds produced less accurate maps than the older groups who did not differ ( $p<.05$ ).

In general, therefore, 7-year-olds communicated less successfully on this task than older children. Let us now consider the kinds of dialogues which different speakers produced. Example 1 is from a pair of 7-year-old speakers. Is the following dialogue coherent?

- (1) IG: Louisa; IF:Fiona (deviation score = 266 cm.sq.)  
 IG: ehm Fiona start from the dead tree and then you'll come to a graveyard - and when you go up you'll see a volcano\* - then when you come down a bit you'll get to some giraffe - and then move along and you'll get to a desert\* and then the other dead tree\* - and then you come to a mountain then you come to some mountains - then a lake and then you're at the end\* and then you're at the end  
 (\* Indicates feature shown on only one participants map; - Indicates brief pause)

If we look at Figure 1A, at the map the instruction-giver was describing, this may seem a reasonably coherent set of instructions for a 7-year-old to give, but if we look at Figure 1B, the map on to which the instruction-follower was trying to draw the route, we see that the instructions were not fully interpretable for the listener. In particular references are made to features such as 'volcano', 'desert' and 'other dead tree' which the instruction-follower knows nothing about. Not surprisingly the route which she drew was very different from the original shown on the instruction-giver's map, that is this dialogue was a fairly unsuccessful communication, the deviation score being substantially above the mean for this age group.

Why was this so? The reader may be surprised that we use the term 'dialogue' for this performance at all, because the most striking feature is the fact that in spite of the task instructions, in spite of the fact these two 7-year-olds were well known to one another and perfectly friendly, only the instruction-giver speaks. This dialogue shows no **negotiated** coherence whatsoever. Such monologues are rare even amongst our 7-year-old subjects, only 2 out of 66 such performances being recorded from 7-year-old pairs, with 1 out of 50 performances from 9-year-old subjects.

Dialogues which exhibit a lack of successfully negotiated coherence do

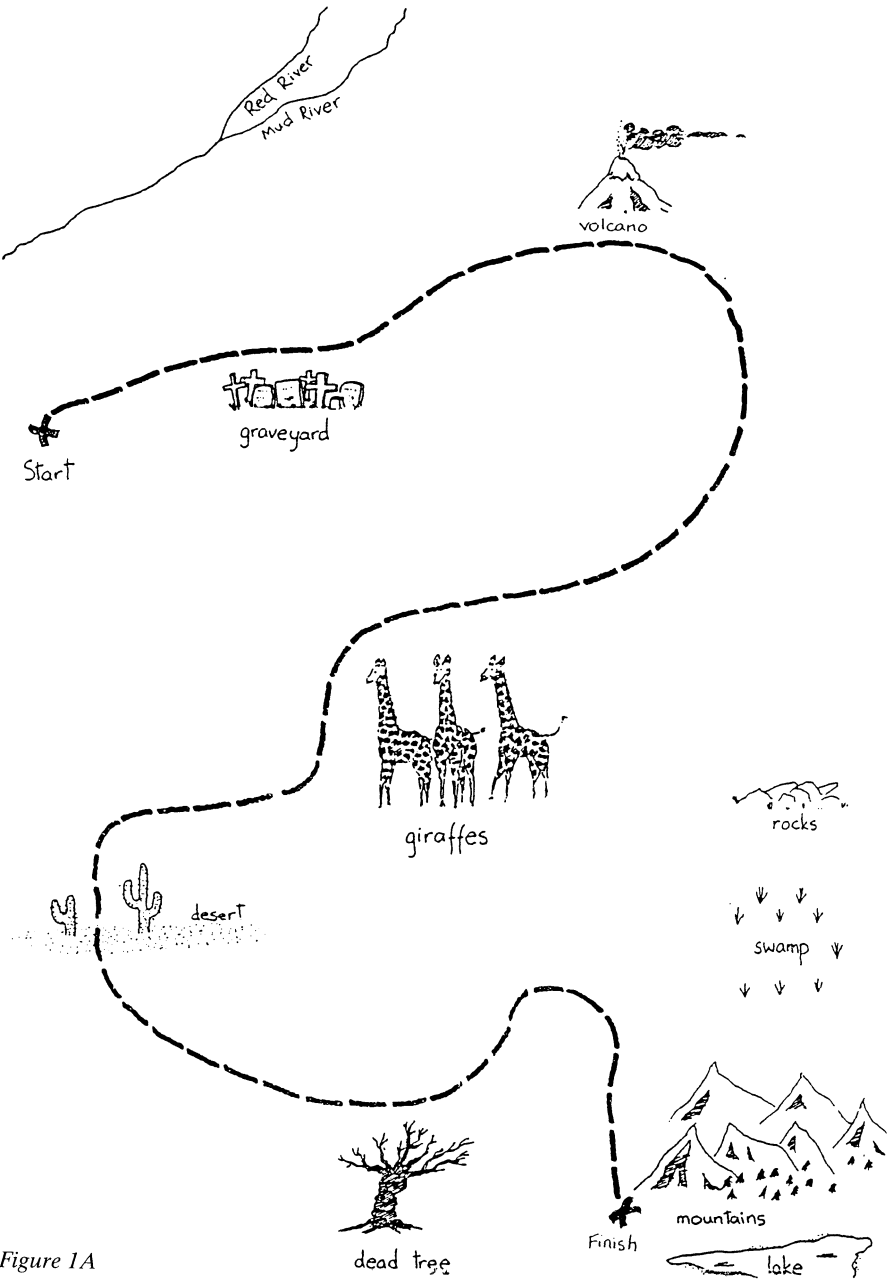


Figure 1A

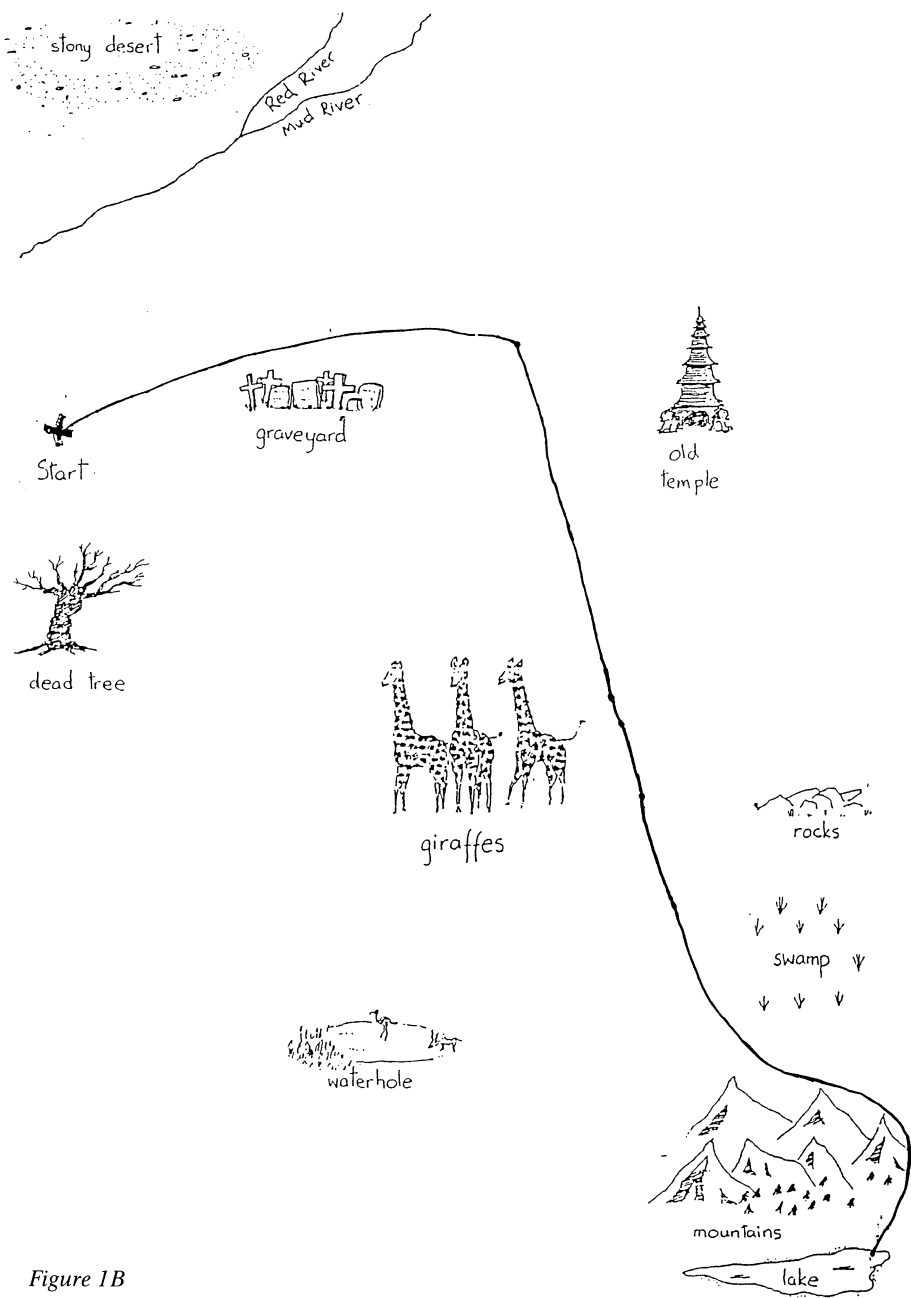


Figure 1B

not always arise, however, from monologues. The extract below illustrates a dialogue in which both speakers participate and discuss the same critical landmark feature, but which still does not apparently achieve the criterion that both participants can interpret what is said.

- (2) IG: Nicola; IF: Barry (deviation score = 261 cm. sq.)  
IG: Barry start at the start - go  
IF: Right  
IG: Turn at crash ship - go to the mountains\*  
IF: What mountains?  
IG: Go to the fuel tanks  
IF: There isn't any mountains on this  
IG: To the -  
IF: I can't even see the mountains  
IG: Go left again - keep going - go to flying saucers then turn  
and go to finish the city  
IF: I'm stuck here  
IG: Start at the start .....

Now consider the following dialogue recorded from two other 7-year-olds, from the same class in the same school. These speakers are tackling another comparable version of the map task shown in Figures 2A and 2B. Again features shown on only one participant's map are marked \*.

- (3) IG: Gillian; IF: Rebekah (deviation score = 88 cm.sq.)  
IG: Got some hills?  
IF: Yes  
IG: Right come round the hills - you see - have you got a crashed aeroplane\*?  
IF: No  
IG: Well come down OK from the hills  
IF: I've got a burnt I've got a burnt forest\*  
IG: Ehm - have you got an old church in yours?  
IF: Yes  
IG: Go round the old church - have you got a bridge\*?  
IF: No  
IG: Eh - walk across the - eh water OK?  
IF: I've done that  
IG: Come round the oops there something the executing thing\*  
and then come down and round - have you got a finish\*  
cave?

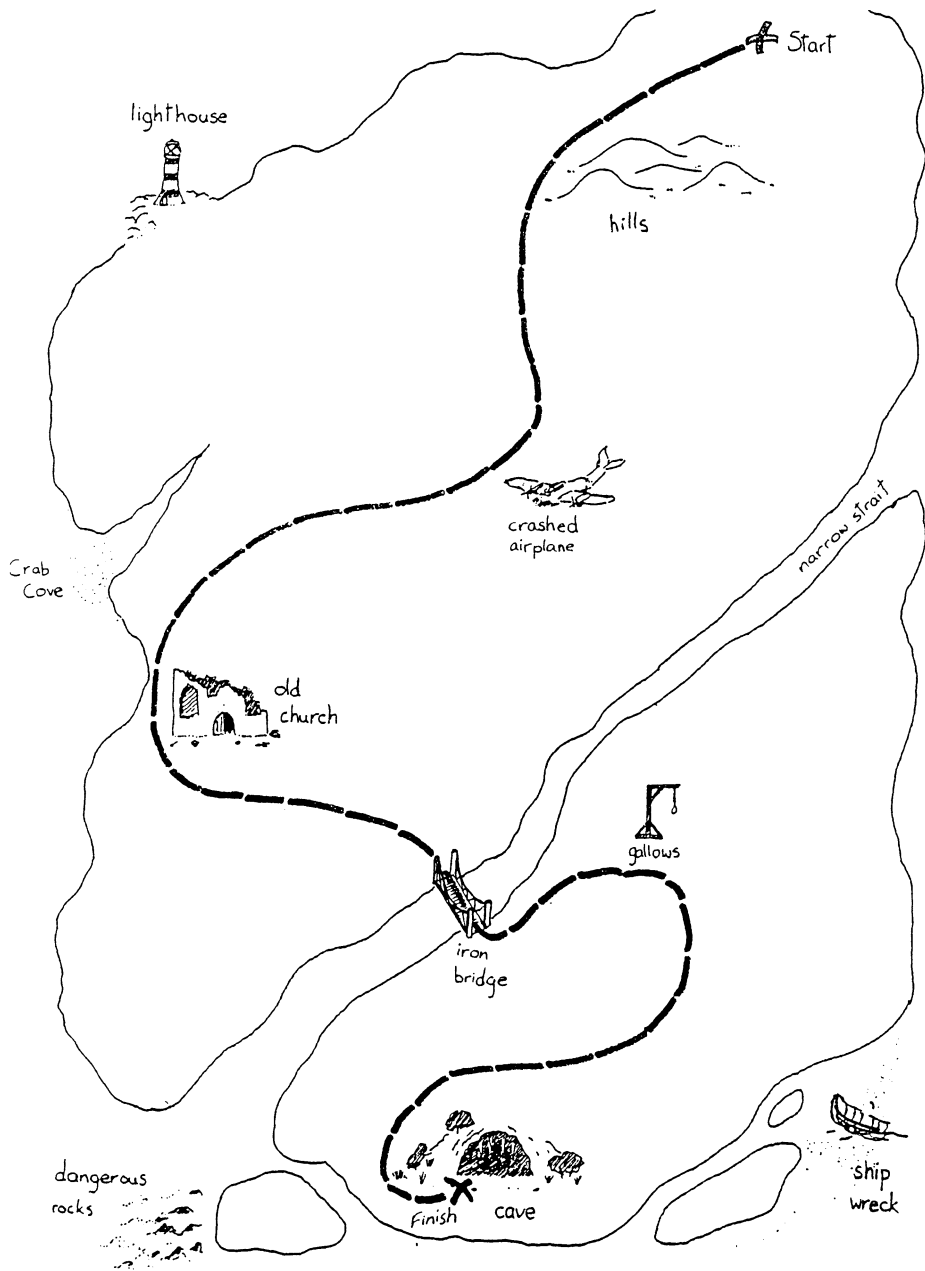


Figure 2A

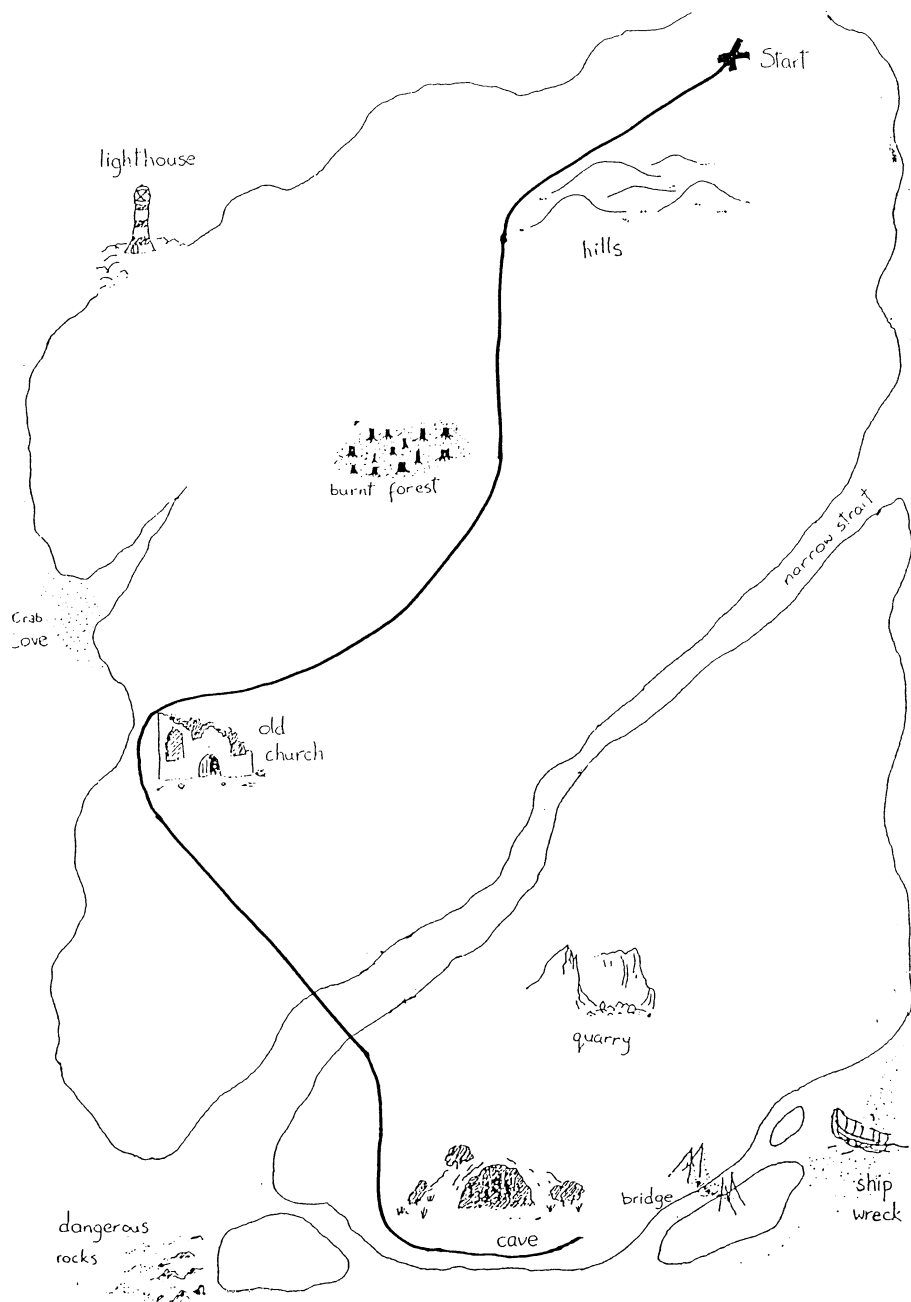


Figure 2B

- IF: No I've got a cave - but I haven't got a finish cave  
IG: Well come down to the cave  
IF: Uhu  
IG: And that's it

Here we see a radically different approach to the communication problem. The general impression from this dialogue is that these young speakers actively cooperate to achieve a mutually intelligible discourse. As a result of their efforts, the route which the young instruction-giver drew quite closely resembled the original the instruction-follower was describing. We can say quite objectively that dialogue (3) with a deviation score substantially below the mean for 7-year-olds, was a much more successful communication than either dialogue (1) or (2).

But what was it about the language which demonstrated this greater degree of negotiated coherence? Probably the most striking feature is the extent to which the instruction-giver encouraged the instruction-follower's participation by asking questions, particularly when a new feature was introduced. The use of introductory questions at least in these examples did seem an important factor in communicative success. We therefore decided to examine the forms of introduction used by all the speakers in our sample, to compare the frequency with which speakers of different ages use such question forms. All the introductions of landmark features in our 170 child dialogues were examined which produced a total of 1226 introductions to be analysed.

### **3. Results**

#### **3.1. Introductions in child dialogues**

All first mentions of features in the child dialogues were classified in this way, according to the speaker who made the introduction (instruction-giver or instruction-follower) whether a question or non-question form was used, and whether a definite or indefinite article was included. (The small number of instances where subjects omitted articles in their introductions, for example, "you go up past waterfall" were excluded from the analysis.)

In the developmental literature in particular, the appropriate use of definite and indefinite articles when introducing entities has been seen as a very important aspect of developing communicative competence and has

generated quite a body of psycholinguistic research (see, for example, Menig-Peterson, 1975; Maratsos, 1976; Warden, 1976, 1981; Emslie and Stevenson, 1981; Karmiloff-Smith, 1979, 1985; Power and Martello, 1986). Some studies (but not all) seem to show that young children overuse the definite article as they fail to take their listener's knowledge state into account. (For a full account of children's use of articles in introductions in the map task dialogues see Anderson, Clark and Mullin, 1991.) The comparison of the relative importance of article choice and introductory question forms in determining mutual intelligibility is therefore potentially very interesting in the study of children's dialogues.

We categorized those instances where the speakers chose explicitly to probe their listener's state of knowledge by asking a question compared to those cases where the introductions were embedded in the general instruction giving for the task. The introductions coded as *questions* were those utterances containing the first mention of a feature which were in interrogative form, where the question being posed concerned the listener's awareness or knowledge of the feature being introduced. We excluded from the 'question' category those instances where the utterance itself was in interrogative form, but where the information being sought was not about the listener's knowledge of the newly introduced feature. So an utterance like:

(5) do I dodge *the crocodiles*?

would not be categorized as a question introduction as the question is concerned with extracting route information. We included in the question category utterances where part of the interrogative form was elided but enough of the form was stated to indicate an interrogative rather than a declarative or imperative was intended. Examples (6), (7), (8) and (9) illustrate these categorisation decisions.

- |     |                                                      |                  |
|-----|------------------------------------------------------|------------------|
| (6) | up to + have you got a <i>Palm beach</i> ?           | Question + Indef |
| (7) | now it's down over + do you have <i>the bridge</i> ? | Question + Def   |
| (8) | See <i>the swamp</i> ? - you've to go round there    | Question + Def   |
| (9) | have you <i>some mountains</i> in the middle?        | Question + Indef |

In contrast we classified as *Non-Questions* (NQ) introductions first mentions of features where the introduction was part of the instruction-giving process and not marked off by a question about the listener's knowledge. These could either be declaratives such as:

- |      |                                               |            |
|------|-----------------------------------------------|------------|
| (10) | <i>The swamp</i> is just above the Palm beach | NQ + Def   |
| (11) | There's a <i>bridge</i> over there - cross it | NQ + Indef |

In this instruction giving task more commonly these were in the imperative form; for instance:

- |                                                   |            |
|---------------------------------------------------|------------|
| (12) go up to <i>the swamp</i>                    | NQ + Def   |
| (13) go round to where there's <i>a waterfall</i> | NQ + Indef |

The minority of examples like (5), where an utterance was interrogative but the information being requested did not concern the listener's knowledge of the introduced feature, were also included in the NQ category, as in terms of the introduction function we felt such instances belonged in this general 'unmarked' category. All 170 child dialogues were analysed in this way and then a randomly selected subsample of 20% of the dialogues, yielding a total of 229 introductions, were 'blind marked' by a second independent judge. The categorisations of the two judges agreed in 94% of cases.

As subjects could choose how many features or how few they mentioned during the task (subject pairs mentioned from 0 to 14 features), the totals recorded in each classification were in effect independent of one another and the data for all performances were subjected to a 4 factor 3 x 2 x 2 x 2 Analysis of Variance with Age (7-8, 9-10, 12-13) as a between subject grouping factor, with Subject Role (instruction giver vs instruction follower) as a between subject factor, with Form of introduction (question vs non-question) and Type of article (definite vs indefinite) treated as within subject repeated measures, and number of occurrences per dialogue as the dependent variable. A summary of the data for this analysis is shown in Table 1.

The ANOVA showed no significant main effect of Age ( $F < 1$ ); overall, older subjects do not introduce any more features in their dialogues than younger subjects.

There were highly significant main effects of speaker role, form of introduction and type of article ( $F_{1, 164} = 261.02$ ,  $p < .0001$ ,  $F_{1, 164} = 57.03$ ,  $p < .0001$  and  $F_{1, 164} = 102.20$ ,  $p < .0001$  respectively). This shows that, as we would expect from their role in the task, instruction givers introduce more features than instruction followers. Overall, non-questions were more frequent than questions and most introductions used definite articles.

The ANOVA also showed several interesting statistically significant interactions. There was a significant Age x Form interaction ( $F_{2, 164} = 5.63$ ,  $p < .005$ ), and simple main effects tests carried out within this interaction showed that the youngest subjects (7-8 year olds) used question introductions significantly less often than their elders ( $p < .001$ ), and that it was

Table 1. The distribution of introductions of all the features by age of speakers (mean number of cases per dialogue)

| 7–8 yr old speakers (number of dialogues=66, total features introduced=465)   |         |           |          |            |
|-------------------------------------------------------------------------------|---------|-----------|----------|------------|
|                                                                               | NQ Def. | NQ Indef. | Qu. Def. | Qu. Indef. |
| Instruction-giver (IG)                                                        | 3.72    | 0.43      | 0.69     | 0.65       |
| Instruction-follower (IF)                                                     | 1.13    | 0.21      | 0.08     | 0.09       |
| 9–10yr old speakers (number of dialogues=52, total features introduced=402)   |         |           |          |            |
|                                                                               | NQ Def. | NQ Indef. | Qu. Def. | Qu. Indef. |
| Instruction-giver (IG)                                                        | 3.03    | 0.38      | 1.07     | 1.46       |
| Instruction-follower (IF)                                                     | 0.92    | 0.46      | 0.23     | 0.1        |
| 12–13 yr old speakers (number of dialogues=56, total features introduced=359) |         |           |          |            |
|                                                                               | NQ Def. | NQ Indef. | Qu. Def. | Qu. Indef. |
| Instruction-giver (IG)                                                        | 2.69    | 0.13      | 1.09     | 1.03       |
| Instruction-follower (IF)                                                     | 1.03    | 0.34      | 0.21     | 0.34       |

only in the youngest age group that the difference between the frequency of use of questions and non-questions reached significance ( $p < .001$ ).

There was also a highly significant interaction between Form x Type ( $F_{2, 164} = 152.84$ ,  $p < .001$ ). The least frequently used category of introduction was a non-question with an indefinite article (e.g. “There’s a swamp - go up there”). This was less frequently selected than any other category (Newman-Keul’s test  $p < .01$ ).

Within the question categories there was no significant difference between the frequency of use of definite and indefinite articles, so the main effect difference between definite and indefinite article use is caused solely by non-question introductions, where indefinite articles are rare. When questions are chosen, significantly more indefinite articles are used (Newman-Keul’s  $p < .001$ ) and the indefinite form is just as numerous as the definite.

This effect does not interact significantly with age (Form x Type x Age,  $F < 1$ ), which suggests that at each age group the choice of non-question form makes the use of definite articles more likely but when questions are chosen, even the youngest speakers will as often use indefinite as definite articles. It is the likelihood of choosing **question** forms which seems to

increase with age not the use of indefinite articles per se, nor the likelihood of using indefinite articles in questions.

There was also a significant Speaker Role x Type interaction ( $F_{1, 164} = 45.42$ ,  $p < .001$ ) within which Newman-Keul's' tests showed that there were more introductions from instruction givers using definite articles than any other category and that there were fewest introductions from instruction followers using indefinite articles.

The number of question introductions was also correlated with the corresponding deviation score for each dialogue:  $r = -0.344$ ,  $p < 0.01$ , for all child data. Dialogues which contain a high number of question introductions generally produce more accurate map routes than those with fewer question introductions, and this holds true even for our youngest speakers, ( $r = -0.33$ ,  $p < 0.01$  for 7 year olds).

In general then younger speakers make less use of the question form of introduction which seems characteristic of dialogues like (3) which show marked negotiated coherence. They are also on average less successful at the communication task than their elders. However, the minority of 7-year-olds who do use such forms, also communicate more successfully. (The considerable variability in children's communication skills is described in Anderson, Clark and Mullin, 1994.) The two dialogues from 7-year-old speakers in examples (1) and (3) might be thought of as the two ends of the negotiated coherence continuum, at least for this age group, with one dialogue showing no use of questions, and being fairly unsuccessful, whilst the other which was much more successful, shows nearly all new features being introduced by instruction-giver questioning whether instruction-follower could interpret the instruction. In example (14), again from a pair of 7-year-olds at the same school, we see a dialogue more typical of this age group.

(14) IG: Iain; IF: Marc ( deviation score = 178 cm.sq.)

IG: Right you know where the start is?

IF: Uhu

IG: Well go above the graveyard got a graveyard?

IF: Yes

IG: Go above it to your right and go - up up in a circle just under the volcano\* right

IF: Uhu

IG: And then come right down over the top of the zebras no the giraffes