

Analysis of the Relationship between Teaching Discourse Markers to ESP Learners and Their Reading Comprehension Performance

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This study analyses the effect the teaching of discourse markers has on ESP learners' reading comprehension. Following a relevance-theoretic approach, we consider discourse markers as signals the speaker/writer uses to guide cooperatively his hearer's/reader's interpretative process. Therefore, they play a facilitating role. Our study intends to show that training learners in the recognition and use of DMs will improve their reading comprehension. We conclude that this instruction has a positive effect on the reading comprehension of learners of English for specific purposes.

1. Introduction

Until recently communication was seen as a process of codification and decodification of utterances. However, since Grice (1975), communication is perceived in a different way. It does not constitute exclusively a codification process but also, and mainly, an inference labour. The speaker tries to make the hearer reach a series of inferences through the interaction of the utterance with the context. When I say *I am cold*, I not only want my interlocutor to understand my utterance, but I also want him to understand that I want to close the window. From this approach, we can say that one of the functions of discourse markers (henceforth DMs) consists of facilitating inferences that want to be communicated¹.

Sperber and Wilson (1986/1995) have developed a theory, the Relevance Theory, based on Grice. This is a pragmatic model that attempts to explain how

¹ Grice (1975) distinguishes between implicatures -conversational inferences- and conventional implicatures. An implicature is a proposition conveyed implicitly by an utterance. Such propositions are considered implicit in the sense that they are not part of what is 'said', that is, they are not part of the truth-conditional content of the utterance that conveys them. Ordinary conversational implicatures, in the Gricean sense, are implicit propositions which can be inferred from what is said based on pragmatic principles, but a conventional implicature is an implicit proposition which is encoded in a particular linguistic expression rather than inferred. This distinction is taken into account by D. Blakemore (1987:76) for the development of her theory on connectives.

speakers interpret utterances. It is based on a hypothesis of a cognitive nature about how human beings process linguistic information. This hypothesis suggests that the mind's central processor is highly effective in handling the information because it is specifically oriented towards the search for relevance.

The Principle of Relevance entitles the addressee to assume that an utterance comes with a guarantee of its own optimal relevance. An interpretation is considered to be consistent with the presumption of optimal relevance if the speaker could rationally have intended to be optimally relevant to the hearer on that interpretation. The presumption of optimal relevance entitles the addressee to expect a level of relevance which is high enough to justify attending to the stimulus, and which is the highest level of relevance the communicator was capable of achieving given his or her means and goals. Having accessed an interpretation consistent with the presumption of optimal relevance, the hearer takes that to be the intended interpretation.

On Sperber and Wilson (1986/1995)'s view, utterance interpretation involves decoding and inference. Decoding leaves the hearer with an incomplete (i.e. not fully propositional) conceptual representation. In order to arrive at a fully propositional representation, the hearer has to inferentially enrich the incomplete representation. This inference is basically a process of hypothesis formation and confirmation. Relevance is the criterion for testing the hypotheses. Other things being equal, the hearer will choose an optimally relevant interpretation. According to Sperber & Wilson (1995: 270) an utterance is optimally relevant iff (a) it achieves sufficient contextual effects to be worth the hearer's processing effort and (b) it is the most relevant one the speaker could have produced given her abilities and preferences.

Probably one of the most important contributions of the Relevance theory to linguistic research is the review and redefinition of the concept of context. For Sperber and Wilson, context includes not only the information about the immediate physical environment (physical context), or about previous utterances (linguistic context or co-text), but also a set of assumptions stored in memory and deductively accessible, which participate in the interpretation of an utterance as well. These assumptions are made up of information of all kinds: beliefs, cultural knowledge, sociolinguistic competence, daily experience, encyclopaedic knowledge of the world, etc.

There are three basic ways in which information provided by an utterance can combine with the context. Firstly, it may combine with existing assumptions to yield a contextual implication. Secondly, new information can strengthen an existing assumption of the hearer's. Finally, new information can contradict and eliminate one (or, indeed, more) of the hearer's existing assumptions.

1.1. Relevance theory and discourse markers

In the 70s and 80s text linguistics focused on the grammatical elements that appear in utterances connecting sentences and, in general, textual sequences (see, especially, Halliday and Hasan, 1976). From this theoretical perspective, the presence of connective sequences is closely related to the properties of cohesion and coherence, considered the defining characteristics of the text; in this way, connection is considered one of the cohesive procedures of text (together with reference, ellipsis and lexical cohesion) and is regarded as the mechanism that specifies the particular semantic relation obtaining between two sentences. However, later studies have revealed the inaccuracy of this analysis of discourse markers as providing cohesion. Thus, it must be pointed out that, on the one hand, the lack of this type of connective device does not necessarily imply the disappearance of the conjunctive relation they express, and, therefore, the global utterance formed by two propositions related without a connective may be perfectly coherent.

On the other hand, the presence of a connective does not guarantee the interpretability of the resulting utterance, as the following example shows:

(1) He is French; however, he is a pilot

Although we understand the conceptual meaning of the propositions employed, as well as the contrasting value of the connective *however*, it is difficult to interpret this utterance as a whole, since we do not see in which sense being French is in contrast with being a pilot.

In sum, the interpretation of a text or utterance does not depend on the cohesive devices it contains, therefore cohesion is not a necessary condition for the communicative effectiveness of a text or utterance (cf. Blass, 1990).

With respect to the second distinctive characteristic of texts, coherence, as Blakemore (1987) points out, even if the text contains formal mechanisms that

manifest its internal coherence—for example, discourse connectives—, it is possible that such connective devices may not be established among explicit elements of the text, but may indicate a relationship between a proposition conveyed by an actual utterance and a proposition that has not been linguistically realised. The hearer has to use the discourse connective to access implicit assumptions only accessible in the cognitive context and use them to process the utterance.

In sum, coherence relations are not necessary to account for utterance interpretation or textuality. The fundamental assumption of Sperber and Wilson's model is that what is communicated should not so much be related to previous information, that is, be coherent, but should be essentially relevant, that is, important and informative. Therefore, from a relevance-based perspective, an utterance that is not formally or semantically connected to a previous one may be relevant in a given context. As Blass (1990) states, what textual approaches based on coherence and cohesion lack is an adequate notion both of context, and the relation between text and context.

As we have already pointed out, Relevance Theory states that speakers interpret information searching for relevance. As the information carried by an utterance only has contextual effects if it is combined with the adequate assumptions existing in the mental representation of the world the hearer has stored in his memory, a crucial aspect of Sperber and Wilson's theory is how the appropriate context is selected and made accessible in each case. It is at this point where, according to Blakemore (1987), the expert in the study of DMs (she calls them discourse connectives) from a relevance-theoretic approach, connectives contribute essentially to the interpretation process. From this theoretical perspective, connectives are considered signals the speaker uses to guide cooperatively his hearer's interpretative process.

Blakemore (especially 1987, 1988, 1989a, 1989b, 1992 and 1993) considers that the essential function of elements like *likewise*, *therefore*, *because*, etc is to guide the hearer's interpretation process through the specification of certain properties of the context and the contextual effects; more specifically, these elements constrain the relevant context for the interpretation of an utterance, reinforcing some inferences or eliminating other possible ones and thus help process the information.

DMs, therefore, have a guiding meaning for inference in the interpretation process. Blakemore proposes that DMs do not have a representational meaning the way lexical expressions like *boy* and *hypothesis* do, but have only a procedural meaning, which consists of instructions about how to manipulate the conceptual representation of the utterance (cf. Blakemore, 1987, 1992). Words with conceptual meaning contribute to the content of assertions and are analysed as encoding elements of conceptual representations. Words with procedural meaning, on the other hand, encode information about how these representations are to be used in inference, they tell you how to 'take' these representations. In Blakemore's view, DMs do not contribute to the proposition expressed by an utterance or to any other conceptual representation the utterance may communicate; rather they point the hearer to the context in which he is expected to process the utterance and the conclusions he should be drawing from it.

The notion of procedural meaning is not unique to RT. As Wilson and Sperber (1993) point out the idea that some linguistic expressions do not encode concepts but indicate how to 'take' a host sentence or phrase is developed in the work of Ducrot and his associates (Ducrot, 1972, 1973, 1984; Anscombe and Ducrot, 1983). Roughly similar notions also surface in RT-influenced accounts of items referred to as DMs, for example in Hansen's claim that DMs lack a conceptual core and 'are basically instructions *on how to process their host utterance in a given context*' (Hansen, 1997:160).

We can conclude this section by saying that the most relevant contribution of the Relevance Theory to the study of DMs is the semantic-pragmatic characterisation of these units as aids or instructions for interpretation—specifically, the facilitation of inferences—and, therefore, the definition of DMs as elements with procedural meaning.

2. Our study

As we have made clear in the previous sections, for relevance theorists DMs constrain the interpretation process by guiding the hearer towards the intended context and contextual effects. Therefore, DMs play a facilitating role.

Since DMs facilitate communication, it is logical to suppose that the lack of DMs in an L2, or their inappropriate use could, to a certain degree, hinder successful

communication or lead to misunderstanding. L2 learners must learn to signal the relations of their utterances to those that precede and follow. Therefore, in terms of communicative competence, L2 learners must acquire the DMs of the L2. It is plausible to suppose that those nonnative speakers who are competent in the use of the DMs of the L2 will be more successful in interaction (oral and written) than those who are not.

We will study DMs in written discourse². Our hypothesis is that training learners in the recognition and use of DMs will improve their reading comprehension.

Having already acquired his native language, the learner has already understood implicitly a great deal about language as a meaning-creating system. He has already understood implicitly that language encodes and signals relational values and he is already familiar with these relational values which will be encoded and signalled in his target language. What he is not familiar with are the particular ways in which the linguistic system which constitutes his target language encodes and signals these values.

We suggest making learners progressively aware of or acquainted with DMs, activating DMs in the learner-reader's mind in such a way that the focus is on learning these units not as formal elements but as they are realized within discourse.

2.1. The research design of the experiment: experimental research data procedures

2.1.1. Subjects

We tried to control the internal validity of the experiment working with an homogeneous group of subjects. We recruited a group of 60 Spanish students of English as a foreign language all students of the second year of English for Science and Technology at the Technical University School of Industrial Engineering in Gijón.

² We follow the view of reading within the communicative frame, as a communicative interaction between reader and writer, a communicative act where the reader uses the information in the text to change his cognitive structures (Sinclair, 1981, Widdowson, 1983, Tadros, 1985).

The subjects were of a similar age, ranging from 20 to 25. Besides, they had all been our students of English the previous year, and their previous knowledge of the English language was similar (they had been studying English for at least four years before entering University).

We wanted to compare the behaviour of the same readers before and after being trained in the use of DMs. That group of subjects constituted our experimental group. There was also a group of sixty subjects that constituted the control group whose instruction consisted in reading and discussing answers to questions .

2.1.2. Materials and training procedures

In order to make students aware of DMs we instructed them through the identification, explanation, recognition and use of DMs. We instructed the experimental group in their normal classrooms. The instruction took 3 weeks (two hours per week). The instruction included teacher modelling of explicitly defined procedures, guided practice, teacher monitoring with corrective feedback, and independent practice.

Week 1: Goal: Identification and explanation of DMs.

As a first stage, we start explaining and making students familiar with the different English DMs. We prepared material containing the following activities:

- (a) Definition and description of the different DMs following Fraser's (1999) classification³.

³ Fraser (1999) distinguishes two main classes of discourse markers: Discourse markers which relate messages and Discourse markers which relate topics. The first class involves DMs which relate some aspect of the messages conveyed by the segments S2 and S1. There are three main subclasses in this first class. The first class refers to DMs that signal that the explicit interpretation of S2 contrasts with an interpretation of S1. Fraser labels such DMs Contrastive Markers (but, however, (al)though, etc.). A second subclass of DMs relating aspects of S2 and S1 messages signal a quasi-parallel relationship between S2 and S1. This subclass of DMs is referred to as elaborative markers and includes and, above all, also, besides, etc. A third subclass includes DMs which signal that S2 is to be taken as a conclusion based on S1. This group

(b) Reading a text containing DMs (see APPENDIX A). The subjects had to read the text and we explained the DMs the text presented.

In this text, entitled Pipe Bender, from *The Practical Householder*, May, 1980, p. 14, we see how the normal problem with bending copper pipe is that of the pipe collapsing or "buckling". This was not a problem when internal bending springs were used, but that solution to the general bending problem was not adequate for bending pipe near the ends. *Although* signals the contrast between adequate use and inadequate (problematic) use of the internal bending springs.

Although the first sentence is very long indeed, the clear structure, signalled by *although* and helped by the commas, and the break with the dash make it very readable.

We explained all this to our students. These activities were carried out with the whole group, with the participation of all the students.

Week 2: Objective: Recognition and use of DMs.

We provided readers with lists of clauses (see APPENDIX B1) and showed them how to link these so as to produce coherent sentences. These clauses included DMs.

Once we had joined the clauses we explained the meaning of the DMs. These were contrastive, elaborative, inferential and reason markers.

With this activity we had made readers familiar with relational signals and with their correspondent relational values⁴.

We, then, gave readers another group of sentences. They had to be linked again in a coherent way. However, this time we did not include DMs in these sentences

which Fraser (1999) labels inferential markers includes so, of course, accordingly, as a consequence, etc. Finally, Fraser (1999) distinguishes some additional subclasses: a group of DMs which specifies that S2 provides a reason for the content presented in S1, which includes after all, because, for this/that reason, since. The second class of DMs, topic relating discourse markers includes back to my original point, before I forget, by the way, etc.

⁴ Other possible activities are: Learners can be encouraged to scan short texts for DMs. It may also be appropriate to construct exercises which involve the translation of tables, graphs, etc, into prose. Guidance could be provided in the form of ordered lists of DMs. They could also be given DMs and be asked to construct a short text about a certain topic using those markers.

(see APPENDIX B2). The different sentences had to be joined so as to form a long and complete sentence. Readers had to provide contrastive, inferential, elaborative and reason DMs.

Week 3: Objective: Recognition and use of DMs.

We conducted a brief review of all the information and ideas we had introduced in the previous session. Then the readers were given a passage entitled Skidding Resistance Measurements from Chapter 6 of "The road user, the vehicle and the road" in *Traffic Planning and Engineering*, 1979, pp. 298-299, and another passage entitled How a circuit breaker operates from *Engineering Design*, 1983, p.192 (see APPENDIXES C and D). They first read the passage silently. They had to read the text and explain the function of the DMs present. There were contrastive, elaborative and inferential markers. As students worked independently in their text, we circulated and monitored individual work, providing corrective feedback and assistance as needed. Once students had independently worked on the passage, we asked one of them to express his results to the rest of the class.

Our first observation of the effect of this instruction was that, by means of it we had made readers aware of signalling devices.

Meanwhile, the control group had been given the same texts. They had to read them and try to understand them. Their instruction, part of the class activities, entailed reading and discussing answers to questions.

2.1.3. Testing procedures

One week prior to the onset of the training, all subjects were given the pre-tests. One week after the training, all subjects were given the same tests as post-tests. The rationale for using exactly the same test for both pre- and post-testing was to assure exactly comparable tests, thus avoiding the problem of equating different forms of pre- and posttests. The interval between administrations was deemed long enough to control for any short-term memory effects; since subjects were not provided with the correct answers after the pretest, even if they remembered how they had answered a question the first time, they had no way of knowing whether that answer was correct. Further, the interval was considered short enough to avoid any significant learning except for that due to the training.

In order to compare both types of instruction, we used two tests: (a) a comprehension test; (b) a test which consisted of the identification of a text's DMs.

On the day of testing we asked subjects to read and study the passage "New Metal Halide Lamps Features Long Life and Improved Colour Rendition" from *Engineers' Digest*, April 1976, p.17 (the passage is reproduced in APPENDIX E). We gave both the control and the experimental groups of readers this text for them to read.

In this text, the purpose of this description is to stress the improvement of the new lamp on existing metal-halide lamps. The title includes assessment of long life and improved colour rendition, the basis for which is provided later.

The first sentence allows us to recognize that the problem being overcome by the new lamp involves improvement compared with existing lamps. The second sentence tells us how the new lamp works and therefore provides details of the solution being described. The third sentence provides further details and then supplies the comparison of greatly enhancing light source stability with improved colour rendition. The basis for these assessments is given in the preceding sentence, as an understanding of how the lamp works enables readers to accept that the assessments may well be true. In the second paragraph the other advantages are assessments of the new lamp compared with earlier types.

After reading the text readers had to answer the comprehension questions referring to the text (see APPENDIX F). We elaborated questions about specific information of the passage and questions trying to cover the complete meaning of the text

Finally, we asked readers about the DMs the text presented. They had to indicate the DMs in the text as well as their function in the text. There were elaborative and inferential markers.

Each pre and post-test was scored separately. The comprehension questions were scored following the scale 0 (no understanding), 1 (incomplete understanding), 2 (perfect understanding). The second test was scored on whether the readers had identified the DMs correctly or incorrectly.

2.1.4. Results

The table below shows the results of our study. We see the percentage of subjects of the experimental and the control group who understand the text, and the percentage who recognize and explain correctly the DMs of the text.

Group (N=120)	Pre-test	Post-test
<i>Experimental (N=60)</i>		
Percentage of subjects who understand the text	34%	79%
Percentage of subjects who recognize and explain DMs	33%	86%
<i>Control (N=60)</i>		
Percentage of subjects who understand the text	29%	30%
Percentage of subjects who recognize and explain DMs.	29%	29%

TABLE 1

A test of means was carried out using the statistical program SPSS 5.0 for Windows. The level established for significance was $p < 0.05$. We found that the difference between comprehension before and after the training, and between recognition and explanation of DMs before and after the training in the experimental group was statistically significant. The level of significance obtained in both cases is 0.000. In the case of the control group, when we compare comprehension before and after the training, we obtain a level of significance of 0.321,

which means that the difference is not significant. When we compare recognition and explanation of DMs, we see that as the means are identical, there is no difference between values.

In sum, the percentage of the experimental group which understood the text after training significantly increased, whereas the percentage of the control group did not. We can affirm that the methods of teaching reading did produce significant differences on comprehension. Besides, the training enabled the experimental subjects to recognize and explain the DMs of the texts. After training, the percentage of the experimental group which recognized and explained the markers of the text, significantly increased, whereas the percentage of the control group did not.

A test of means was also carried out to find out if there were significant differences between comprehension and recognition and explanation of DMs between the experimental and the control group before and after the training, if the means were significantly different. With respect to comprehension, we found no significant differences between the experimental group ($X=34$) and the control group ($X=29$) on the pre-test (level of significance= 0.83, n.s.). With respect to recognition and explanation of DMs, we found no significant differences between the experimental group ($X=33$) and the control group ($X=28$) on the pre-test (level of significance= 0.321, n.s.). In the post-test, we found significant differences between the experimental group ($X=79$) and the control group ($X=30$) (level of significance= 0.000) when we measure comprehension. With respect to recognition and explanation of DMs, we found significant differences between the experimental group ($X=86$) and the control group ($X=28$) on the post-test (level of significance= 0.000).

3. Conclusion

We present a proposal for improving reading comprehension by means of activities that refer to the identification and utilisation of the DMs of texts. This method of instruction has a positive effect on the reading comprehension of learners of English for specific purposes. We can say that L2 learners who are competent in the use of the DMs of the L2 tend to be more successful in reading comprehension than those who are not.

L2 learners must then acquire the DMs of the L2. Nonnative students need to develop an ability to comprehend and retrieve information from books, textbooks, lectures, etc., quickly and efficiently. This will depend partly on their ability to identify DMs. They will also need to develop an ability to structure their own discourse adequately, making use, where appropriate, of DMs. We propose at least to make a start by giving DMs an important place in ESP syllabus design and lesson planning designing activities and materials to make readers aware of the DMs.

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APPENDIX
A

Pipe Bender

When bending 15mm and 22 mm copper pipe during the installation of my central heating system, I found that although the use of internal bending springs prevented the tube from collapsing, it was difficult to get the degree and position of the bend just right?especially near the end of a length of pipe where it was almost impossible to get enough leverage to bend it over the knee.

The simple pipe bender is made as shown, from a piece of 25 mm thick timber, cut to the marked radii. The two halves can be held in a wide?opening vice, or ideally, between the plastic wedges of a Black & Decker workbench. By placing the pipe between the formers and gradually tightening, a neat, precise bend can be made.

APPENDIX III
B

B1-Make sentences by matching I and II

(I)

- 1.Safety gloves prevent burns
- 2.Although they were not well prepared
- 3.The flow of electrons through an insulator is very small.
- 4.Titanium is used for aircraft frames

(II)

- a. In addition, they reduce the danger of cuts
- b. Therefore, it can be ignored.

- c. Because it is light and strong
- d. They passed their exam

B2-Make sentences by matching I and II

(I)

1. They went to the shop
2. Cast iron is a brittle metal
3. Stainless steels require little maintenance and have a high strength
4. Nylon is tough

(II)

- a. They wanted to buy some presents
- b. Stainless steels are expensive and difficult to machine at high speeds.
- c. Cast iron is not used to withstand impact loads
- d. Nylon has a low coefficient of friction

APPENDIX III

C

Skidding Resistance Measurements

In the past, skidding resistance measurement required a vehicle and elaborate equipment. One of the earlier methods was to lock a vehicle's wheels by violent braking and measure resistance directly with a decelerometer or indirectly in terms of stopping distance. However, this method has many disadvantages and therefore, cannot be used at many sites.

The RRL possesses a machine, code named SCRIM (Sideways force Coefficient Routine Investigation Machine), which can measure and data long coefficients at regular intervals over networks of streets without interfering with normal traffic. The test wheel is side mounted on a motorised tanker with a spray nozzle to wet the test surface. Measurements can be taken between 15 and 100 km/h and at a design test speed of 50 km/h, 80 km/day can be tested.

APPENDIX III
D

How a circuit breaker operates

Circuits can be protected from excessive currents by a fuse or a circuit breaker. A fuse is the simplest and cheapest protection; however for accurate and repetitive operation a circuit breaker is used. The simplest circuit breaker consists of a solenoid and switch with contacts which are held closed by a latch. The current from the supply line flows through the switch and solenoid coil thus energizing the solenoid.

At normal currents, the pull of the solenoid on the latch will not overcome the tension of the spring which holds the latch in place, therefore the switch remains closed. If the current rises to a dangerous level, the pull of the solenoid on the latch increases. The increased pull overcomes the latch spring tension and pulls the latch towards the solenoid. This releases the switch contacts which are pulled apart by a spring. As the circuit is now broken, the unit is protected. When the fault in the supply or unit is righted, the latch can be reset.

APPENDIX III
E

New Metal Halide Lamp Features Long Life and Improved Colour Rendition

Claimed to overcome the problems associated with existing metal-halide lamps, a new design, developed in Japan stabilizes the colours of the various halides employed as the light source by using special rare-earth electrodes.

These electrodes promote the initiation of discharge and allow a part of the rare earth to be discharged from the electrode during its operation, a vital consideration for light generation. Also, it controls the behaviour of the light-emitting substances involved, greatly enhancing the stability of the light source and providing a pleasant white light with improved colour rendition.

Among other advantages of the use of rare-earth electrodes is that they suppress optical and electrical changes, such as variations in the colour of the light,

and increases in lamp voltage; as a result, the stabilized characteristics of the light source become available over a long period of time.

APPENDIX III
F

COMPREHENSION QUESTIONS

1. (a) What is the solution proposed in the text to solve the problems associated with existing lamps?
(b) Explain that solution
2. How does the new lamp developed in Japan stabilize the colours of the various halides employed as the light source?
3. What is in general compared in this text?
4. Among the advantages of the use of rare-earth electrodes, the text indicates that they suppress optical and electrical changes, what are the consequences of that suppression?