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The Teacher Discourse at a Distance:  
Lexical, Morphosyntactical, and Pragmatic Aspects

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Abstract

Studies on instruction and communication at a distance are generally clinical and seldom teacher-centered. The purpose of this paper is to perform a comparative discourse analysis depending whether the teacher is face-to-face or at a distance. We analyze the lexical, morphosyntactical, and pragmatic forms of the two discourses. For each of these levels, we show no significant difference between the two forms of discourse. This result agrees with the conclusion drawn from the famous debate between Clark and Kozma: content prevails over media.

## The Teacher Discourse at a Distance:

## Lexical, Morphosyntactical, and Pragmatic Aspects

Does a teacher at a distance produce the same kind of discourse as a "traditional" colleague, just because he does not see the students and they do not see him? Can distance and therefore media induce an effect on teacher's discourse? As far as we know, these two questions have not often been tackled by researchers. In this paper we will try to bring some answers to these questions in an experimental way.

Despite the impressive number of studies on teaching or communicating at a distance, few employ an experimental approach. In fact, most are student-centered. In our study, teacher's discourse will be analysed as a function of teacher distance: that is, the comparison is between the teacher who is at a distance and the teacher who is face-to-face. The various levels of analysis will be lexical, morphosyntactic and pragmatic.

First, we will briefly review the experimental studies on distance teaching (see Dessus, Lemaire & Baillé, in press, for a broader review of the state of the art). Next, we shall introduce the linguistic analysis of the teacher's discourse. Finally, we will describe our experiment. We begin with some experiments in the field of distance teaching.

### Experimental studies on distance education

Traditionally, these studies are classified in three categories: (a) context-centered studies which are devoted to preactive teaching; (b) process-centered studies, which are concerned with interactive teaching; and (c) product-centered studies which are concerned with assessing instructional effects (Doyle, 1977; Romiszowski, 1990). Table 1 below displays the outlines of these studies.

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Insert Table 1 about here

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### Context-centered studies

The context can be defined as the preliminary aspects of instruction. For instance, lecture-planning and students' characteristics are parts of the context.

Parker (1995) examined what individual characteristics can predict achievement (or dropout) in distance learning. The characteristics studied were the following: locus of control, age, gender, number of distance courses completed, financial support and hours of study. Classes were either face-to-face or at a distance (through three different modes of delivery: computer-mediated communication, audio tape, electronic mail). Parker

found that only the locus of control and the financial support were significantly correlated with student dropout from distance education (these two features can even predict the nearly 85% dropout).

Although the distance teaching literature suggests that research should take into account students learning as well as social-oriented features like motivation, communication, etc. (Johnstone, 1991) , experimental research seems to lose interest in this aspect, which is rather developed by qualitative studies (Laurillard, 1993). The next section discusses another well developed field of research: the distance communication process.

#### Process-centered studies

There are numerous studies which model the interactive stage of traditional instruction (see among others Morine-Dersheimer, 1978; Shavelson & Stern, 1981). However, only few studies are implemented in an instructional distance context (but see Henri, 1989). Therefore, it would be interesting to consider these models when applied to distance education systems.

Henri (1989) examined the features of computer-mediated communication in a learning context, i.e. free circulation of teacher-student messages in

asynchronous teleconferences, which are highly regarded because of their supposed interactivity. The author analysed 290 statements contained in lectures on financial preparation for retirement, following the Bretz's (1983) definition of interactivity<sup>1</sup>. Henri showed that two thirds of the messages were not interactive and that there was very little interaction between students. This result leads one to reconsider the notion of interactivity in such instructional communication systems.

O'Connaill et al. (1993) showed that even in a video conferencing system with optimal video quality and negligible delays, the conversation parameters differ from a face-to-face dialogue. These parameters were backchannels, interruptions, overlaps, explicit handovers, number of turns, turn length and turn distribution. Each of these was studied along three conversation systems: a high-quality video device, a low-quality video device and the standard face-to-face interaction. Results show that, as expected, the conversation is more formal in the low-quality video device, but that it is still the case with the high quality video system (though less pronounced). Contrary to the authors' expectations, specific techniques are used to

achieve speaker switching: for instance, there are fewer interruptions and overlaps and longer conversational turns in a distance system that has a real time image and conversation.

These studies, as well as those by Périn (1992), Sellen (1995), Lebie, Rhoades and McGrath (1996) have not led to a consensus concerning the role of media in learning and communication.

#### Product-centered studies

We will conclude this short review by describing more evaluative distance learning studies which aim to determine learning gains.

The main purpose of Miller, McKenna and Ramsey's (1993) study was to answer this question: "Do students differ in [1] the perception of their mastery of course content, [2] their feeling of 'belonging' to group discussions, and [3] their actual mastery of course content while learning in 'live' and 'remote' conditions?" (p. 53). This evaluative study combines a subjective approach--the first two points--and an objective one--the last point. Students belong to two graduate level sections: on-campus and off-campus. They alternatively attend two types of courses: face-to-face and remote (by means of a two-way interactive video system). On the one hand, the authors point

out that off-campus students' attitudes do not differ between distance and face-to-face lectures. On the other hand, on-campus students significantly prefer remote lectures. Regarding students' content mastery, the on-campus student perform significantly better on measures of achievement (92% vs. 86%).

Lemaire, Marquet and Baillé (1996) point out the differences between a face-to-face teacher's discourse and a distance audiographic one by relying on a morphosyntactic analysis (using in particular Bronckart's, 1985 method, cf. below). The face-to-face discourse appears to be more complex than the distance one. Sentences from the latter are syntactically more correct and less redundant than those from the face-to-face discourse and they contain more anaphoras and argumentative marker and the delivery is higher. The first reason for this difference could be that the teacher had to plan the distance discourse more precisely because of the design of slides and secondly, the analogical information provided by the students (frowns, gestures, etc.) is not replicable by the distance device.

The previous studies were mainly concerned with the students; on the contrary, we now focus on the teacher's discourse.



### Analysis of Teacher's discourse

This analysis was performed along three lines: lexical, morphosyntactic and pragmatic. We will present these analyses together with their theoretical foundations.

#### Lexical analysis

The lexical analysis is concerned with the lemmatized forms of a discourse, which are the forms that appear in a dictionary. Verbs are considered in their infinitive form, nouns in their singular form, adjectives in their singular masculine form, etc. Various lexical indicators such as the frequency of words' occurrence, their distribution in the text, the lexical richness, the degree of connection between two texts, etc. are used (Lebart & Salem, 1994; Muller, 1992).

#### Morphosyntactical analysis

Contrary to the lexical analysis, the morphological analysis is concerned with the word inflexion (verb endings, gender and number of nouns, etc.). If we consider a word as a root (lexeme) plus a flexion (morpheme), we can say that the lexical analysis is concerned with the former whereas the morphological analysis is concerned with the latter. For instance, the word "was" is considered as the infinitive form of "to be" in a lexical analysis,

and as a verb at the first person, singular, imperfect tense in a morphological one.

The syntactic analysis is concerned with the way the words are organized in the sentence as well as their links. The main goal of Bronckart et al. (1985) is to link the occurrence of morpho-syntactic units in texts with the conditions under which they were produced. The authors defined three situations: situated discourses (theatre dialogs, oral dialogs), narrations (novels, tales) and theoretical discourses (scientific texts). The hypothesis is that these different conditions will affect the cognitive processes of speakers, and thus lead them, for example, to choose a certain modal auxiliary, in a particular verb tense, and with a chosen connective to express their ideas. For each situation, Bronckart's model predicts the occurrence of 27 such linguistic units. The model also provides an explanation for these values. For instance, a theoretical situation will lead speakers to structure their discourse and therefore prompt more argumentative connectives such as "nevertheless", "since", "therefore", etc. In contrast, a situated discourse will contain a greater proportion of pronouns of the first and second person because of the live presence of participants in the dialogue.

In order to test the relevance of this model, Bronckart et al. calculated--for 150 texts, 50 of each category--the number of occurrences for these 27 units. A discriminant analysis showed that these 27 units were sufficient to discriminate all the texts. In other words, given a text, the method can predict its type (situated discourse, narration, or theoretical discourse). It can actually suggest the cognitive operations which govern the text production. This model will allow us to compare two texts with respect to their archetypes.

#### Pragmatic analysis

As far as we know, there are very few studies whose goal is to describe a teacher's discourse from a pragmatic point of view (cf. however Henri & Ricciardi Rigault, 1996). Pragmatics assumes that the different participants of a dialogue share a set of conversational rules, which they can refer to, or adjust in order to understand each other's utterances (Caron, 1989). That way, a relationship exists between the signs (words, phrases, etc.) and their use in the discourse. Our work fits in with discourse analysis rather than conversation analysis. Therefore, we will neglect interactions as well as non verbal behavior.

## Method

Overview

This experiment relies on the observation of an undergraduate lecture in economics, which is given to two different groups of students, as follows: (a) face-to-face, in a lecture hall (S1), by a teacher using slides; (b) by means of an audioconference device (S2) which transmits the teacher's voice as well as slides.

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Insert Table 2 about here

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Insert Figure 1 about  
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Procedure and materials

A lecture and a two-hour audioconference, delivering the exact same content, have been totally audio-recorded openly and publicly. The factor that interested us is, *ceteris paribus*, the presence versus absence of the teacher--otherwise the course material was identical (same slides, same lecture duration). Slides were shown to the students during the lecture. Students were given a copy of these slides beforehand.

Data gathering and processing

We transcribed the teacher's discourse as well as the few students' questions in their entirety. The unit we chose is the slide which is considered as a meaningful unit by the teacher. We will now give the details of the different analyses.

Lexical data. We relied on the lexical statistical work of Lebart and Salem (1994) and Muller (1992). First, we lemmatized both discourses (cf. above the section "Lexical analysis"). We made use of different indicators to measure, on the one hand, the lexical richness of each text and, on the other hand, their degree of connexion, that is their lexical similarity (cf. appendix for the details).

Morphosyntactical data. We relied on Bronckart's method to analyze both texts. Each excerpt corresponds to a set of whole slides with at least 1,000 words, which is considered by Bronckart et al. a sufficient threshold.

Pragmatic data. We relied on Searle's (1969) well-known classification. He distinguished between the following acts (Searle, 1969, cited by Winograd, 1988, p. 626-627):

1. Assertive: "commit the speaker (in varying degrees) to something's being the case--to the truth of the expressed proposition." e.g., "very important

goal", "remember I have got a limited number of products".

2. Directive: "attempt (in varying degrees) to get the hearer to do something. These include both questions (which can direct the hearer to make an assertive speech act in response) and commands (which direct the hearer to carry out some linguistic or non-linguistic act)." e.g. "as soon as you've stopped your conversation", "Do you have any questions?", "the theoretical model you should understand".

3. Commissive: "commit the speaker (again in varying degrees) to some future course of action.", e.g., "Next we'll discuss the TES", "later, I will define more precisely what I mean by activity".

4. Declaration: "bring about the correspondence between the propositional content of the speech act and reality (e.g., pronouncing a couple married)." e.g., "The fourth part of this chapter is about to begin", "I'm about to finish this course".

5. Expressive: "express a psychological state about a state of affairs (e.g., apologizing and praising)." e.g., "there's nothing I can do, what can anyone do about it ?", "you are like shatterboxes".

For each slide, we noted the propositions that we considered illocutionary, according to the definitions above. The whole process was performed independently by two judges and a follow-up discussion removed the remaining disagreements.

## Results

### Lexical aspects

The following table shows the values of the indices for the lexical richness measurement.

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Insert Table 3 about here

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The previous values show that the two texts are very similar with respect to the lexical richness.

The lexical connexion index is:

$$CV = 0.491$$

The higher the index, the more similar are the two texts. By comparing it to the values given by Muller (1992), we can say that the connexion is quite strong, which means that the two texts are very similar from a lexical point of view. This result was expected since the teacher, guided by the same slides in both situations, talked about the same content. We will now examine the possible differences from a morphosyntactical point of view.

Morphosyntactical aspects. Since it is not possible to analyze the discourses in their

entirety, two excerpts were randomly selected from each discourse. The following table shows the results. In both excerpts, there is no significant difference between the two discourses (excerpt 1:  $\chi^2(9, N = 27) = 13.8, p > .10$ ; excerpt 2:  $\chi^2(9, N = 27) = 8.4, p > .25$ .

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Insert Table 4 about  
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#### Pragmatic aspects

We then studied the occurrences of illocutionary acts as a function of the situation: presence or distance (cf. table 5). We found no significant differences between the two situations  $\chi^2(4, N = 65) = 1.92, p > .25$ . Moreover, for each illocutionary act, we performed a paired group Student test which showed no significant differences between the two kinds of discourse. For instance, the assertive illocutionary act gave  $t(65) = 0.31, p > 0.75$ .

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Insert Table 5 about  
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## Discussion

These results agree on one point : whatever the level (lexical, morphosyntactic, pragmatic), there is no difference between the two kinds of discourse: face-to-face versus distance. In a previous study (Lemaire, Marquet & Baillé, 1996) carried out in our laboratory (see previous section), we found significant morphosyntactic differences between a face-to-face and a traditional lecture. However, the face-to-face discourse was not supplemented by slides as it was in the distance lecture. This means that the teacher did not work in the same way on both lectures: for one lecture, the content had to be written out on slides; for the other, the teacher's experience was sufficient. Therefore, the previous study combined two factors: distance vs. face-to-face and written lecture planning vs. less materialized lecture planning. Although we noticed differences in the two types of discourse, we were not able to attribute them to one of the two factors because we risked confounds. That is the reason why we designed the study described in this paper. The current results demonstrate that the difference we found previously was most likely due to the two different ways of planning the course rather than to the media themselves: the media does not affect the

teacher's discourse. This result also supports with the conclusions drawn from the famous debate between Clark and Kozma (Clark, 1983, 1994; Kozma, 1991, 1994): content prevails over media. Several other researches come to the same conclusion (Russel, 1995). However, we do not agree with Clark (1994) who says that "media will never influence learning". Like Kozma, we prefer to work on developing situations in which this influence will occur. As Shale and Garrison (1990, p. 31, cited by Ahern & Repman, 1994, p. 539) wrote, "the most important feature for characterizing distance education is not its morphology, but how communication between teacher and student is facilitated". Our future work will examine other aspects of teacher discourse (in particular its prosodic and semantic aspects) as well as other contents (educational science) and situations (educational MOOs).

Authors Notes

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## Footnotes

<sup>1</sup> Bretz's (1983) definition of interactivity distinguishes simulated interactivity, quasi-interactivity and genuine interactivity. The first refers to artificial intelligence and is not relevant to CMC. However, genuine interactivity appears when at least three interventions occur between two participants: one message from A to B; one message from B to A related to the previous message; one message from A to B responding to the previous one. Quasi-interactivity appears when two of these interventions are present, in particular in question/answer patterns.

## Appendix: Lexical Richness and Connection Processing

The lexical richness is calculated using the following values.

$N$ : number of words of the text;

$V$ : number of lexemes of the text, i.e. words of the text in their canonical forms;

$V_1$ : number of one-occurrence words in the text;

$\bar{v}$ : mean frequency, where

$$\bar{v} = N/V$$

$q_1$ : vocabulary repetition ratio, where

$$q_1 = (V - V_1)/V$$

Let  $a$  and  $b$  be two texts, and let  $\leftarrow_a$  et  $\leftarrow_b$  be their respective lexical richness. According to Muller (1992),  $\leftarrow_a > \leftarrow_b$  if all the following conditions are fulfilled:

$$V_a > V_b$$

$$V_{1a} > V_{1b}$$

$$a < b$$

$$q_{1a} < q_{1b}$$

The lexical richness is calculated from the following values (Muller, 1992, p. 147):

$$CV = V_{ab}/V_{a+b}$$

where  $V_{a+b}$  is the number of the lexemes occurring in both texts and where  $V_{ab} = V_a + V_b - V_{a+b}$

Table 1

Outline of the reviewed studies

Authors	Factors	Procedure	Main results
Context-centered study			
Parker (1995)	Face-to-face vs. distance (audio tape, computer- mediated communicatio n or mail).	English sociology lectures. Students' achievement according their individual characteristics.	and Students' locus of control and funds predict 85% distance education to dropout.
Process-centered studies			
Henri (1989)	Remote only, via computer.	Distance lecture on financial preparation retirement. Measure interaction.	Few interactive messages, little genuine interaction of between students.

O'Connell, Face-to-face Work meeting. The distance  
 11, vs. two Comparison of discourse is more  
 Whittaker videoconference the formal: more  
 r and nce systems. conversation's approvals, less  
 Wilbur parameters. interruptions and  
 (1993) overlaps, longer  
 turns.

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Product-centered studies

Lemaire, Face-to-face Economics Higher delivery,  
 Marquet lecture vs. lecture. less redundancy  
 & Baillé distance Morphosyntactica and more  
 (1996) audio l aspects of the argumentative  
 lecture with discourse. makers in the  
 slides. distance lecture.  
 Miller, Face-to-face Education Significant  
 McKenna lecture vs. lectures. difference on  
 and distance, Students attitude:  
 Ramsey for the two attitude about students at a  
 (1993) students their learning distance have a  
 groups. and better opinion on  
 communication. distance  
 learning.  
 Presence students  
 have better  
 achievement.

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Table 2

Description of the two situations observed

Situation	Teacher's location	Number of students	Information transmitted
S1, face-to-face	Grenoble	109 Grenoble	in Teacher's voice by loudspeaker Slides by videoprojection
S2, at a distance	Grenoble	57 Valence	in Teacher's voice Slides by videoprojection Teacher's behavior

Table 3

Lexical richness values for each discourse

Values	Face-to-face discourse	Distance discourse
N	13,319	13,197
V	1,155	1,048
V <sub>1</sub>	433	385
	11.53	12.59
q <sub>1</sub>	0.625	0.632

Table 4

Results of the morphosyntactic analysis for the two excerpts

Unités linguistiques			Excerpt 1		Excerpt 2	
			Presen ce	Distanc e	Presen ce	Distan ce
1.	Pronoun/adj. 1st person singular	19.7	32.1	26.7	21.2	
2.	Pronoun/adj. 1st person plural	1.9	5.2	2.1	0	
3	Pronoun/adj. 2nd person singular	0	0	0	0	
4.	Pronoun/adj. 2nd person plural	14.1	6	4.1	4.8	
5.	Indefinite pronoun "on"	9.4	14.2	8.3	14.4	
6.	Present tense	60.7	54.5	67.7	58.1	
7.	Future tense	5.2	7.9	8.3	8.3	
8.	Perfect tense	12.6	14.5	3.4	10.9	
9.	Imperfect tense	5.9	4.8	13.7	14.4	
10.	Preterit tense	0	0	0	0	
11.	Conditional tense	2.2	2.4	1.4	1.4	
12.	Temporal deictic	0	1.5	0	0	
13.	Auxiliary "aller"	3	6.7	3.4	8.9	
14.	Aspect auxiliary	0	0	0.7	0.7	

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15. Modal auxiliary	3	2.4	4.8	2.7
16. Auxiliary "pouvoir"	1.5	0.6	2.1	2.7
17. Passive form	5.2	1.8	0	0
18. Emphatic form	3	6.7	4.1	4.8
19. Non-declarative sentence	9.4	4.8	4.1	4.7
20. Temporal markers	0	0	3.4	2.1
21. Argumentative lex. synt. markers	30.1	26.9	6.2	6.2
22. Textual argumentative markers	—	—	—	—
23. Utterance modality	0	11.9	3.4	6.8
24. Pronominal anaphora	41.4	29.1	51.9	46.5
25. Non pronominal anaphora	0	0	0.7	2.1
26. Verbal density	0.13	0.12	0.13	0.11
27. Syntagmatic density	0.46	0.49	0.41	0.50



Table 5

Occurrences of illocutionary acts by category and by situation

Situation	Illocutionary act				
	Assertive	Expressive	Commissive	Directive	Declarative
Presence	84	15	23	13	20
Distance	81	15	25	21	19

Figure 1. Figure Captions  
The two teaching situations

