Pedagogic social contexts:

Studies for a sociology of learning

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Chapter 8

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Introduction

The late seventies and early eighties were marked by a crisis in science education, which gave rise to research around the world aiming at finding out why children did not learn the science we wanted them to learn. The research was mostly based on psychological and epistemological theories, which, after 20 years, more sensitive science educators feel are being overtaken by the State crisis again silently imposed on us.

The eighties saw the beginning of a quite different approach, which, based on sociological assumptions, has tried to put together social constructivism, on the one side, and symbolic interactionism and structuralism, on the other. This approach has considered Vygotsky's (1978, 1992) ideas of active learning in social contexts and teachers as the creators of these contexts. Bernstein's theory of pedagogic discourse (1990, 1996) has provided us with the concepts to define those contexts and the interactions which occur in them, and to analyse the influence they may have on children's learning. The same concepts have also been used to study teachers' training contexts and the interactions which occur in them, as well as family contexts and their relations with school contexts. Studies completed so far cover distinct levels of schooling, scientific areas, and micro-contexts within the context of science classrooms. They also cover regulative contexts within these and other learning contexts.

The central objective of the research has been analysis of the influence of family-school and teacher-children interaction in the achievement of socially differentiated learners. We have sought to discover which pedagogic practices improve the learning of children, especially among disadvantaged

social groups, without decreasing the level of conceptual demand made upon them. At the same time we have worked at understanding the relationships between specific characteristics of the pedagogic contexts of school, family, and teachers' education and the acquisition by children of the recognition and realisation rules needed in the production of texts required in specific instructional and regulative contexts of school learning. Our work is within the sociology of learning and we have aimed at making a contribution to a sociological theory of instruction and learning. Overall, our research has been directed at examining the extent to which

1. specific power and control relations that characterise school pedagogic practices lead to differential access to recognition and realisation rules which regulate their learning contexts;

2. children's specific coding orientations (recognition and realisation rules) act as mediating sociological factors in the relation between family and school discourses and practices;

3. specific power and control relations that characterise trainer-teacher interaction lead to differential access to recognition and realisation rules which regulate teachers' learning contexts; and

4. teachers' specific coding orientations (recognition and realisation rules) act as mediating sociological factors in the relation between family and school discourses and practices.

School has been the centre of our intervention and analysis, in the context of family-school-teachers' training relations. In our research methodology, rejecting both analysis of the empirical without an underlying theoretical basis and uses of theory which do not allow for its transformation on the basis of the empirical, we have used an external language of description derived from the internal language of description, as advocated by Bernstein (1996), whereby the theoretical and empirical are viewed dialectically. Theoretical propositions, the language of description, and empirical analysis interact transformatively to produce depth and precision. Our specific language of description clearly indicates our approach as being sociological, focusing on the social relations that constitute pedagogic activity. We point to the importance of calling for order in research within the field of educational sociology. We believe that its "disorder" has been partially responsi-

ble for the rejection of sociological approaches by many educators, including science educators.

Unlike Dowling (2000), we clearly acknowledge our commitment to using a Bernsteinian internal language of description. This language allows us to use the same concepts in contexts as distinct as families, schools, and teachers' education, and across both monologic and dialogic texts (textbooks, syllabuses,[1] classroom practices, family practices, teachers' training practices). Bernstein's theory has also provided our research with a conceptual structure that is diagnostic, predictive, descriptive, explanatory, and transferable, broadening the relationships studied and permitting conceptualisation at a higher level, without losing a dialectical relation between the empirical and the theoretical (Figure 1).

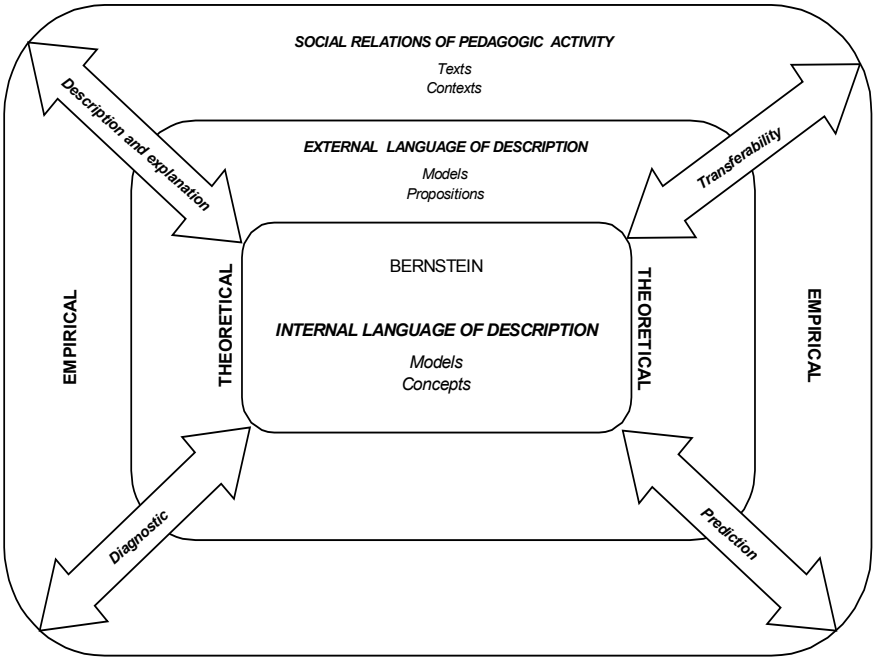

Figure 1—*A sociological research model of methodology, after Bernstein (1996).*

In this chapter we give particular importance to the research method used in distinct pedagogic social intervention and analytic contexts, showing how we have developed an external language of description which provides

textual indicators of the specific characteristics of the contexts under study. We start by referring to these pedagogic social contexts, then we describe some of the models and instruments we constructed for use in the contexts. We give examples of the relationships contained in those models/instruments and refer to empirical cases. Our conclusions attempt to synthesise the main results of several of our studies.

Pedagogic Social Contexts

Pedagogic social contexts are defined by specific power and control relations between subjects, discourses, and agencies/spaces. The interactional dimension of a context is given by relationships between its subjects, the organizational by those between discourses and spaces. Bernstein used classification and framing to analyse pedagogic contexts, whether in the school or at home. Classification (*C*) refers to the degree of maintenance between categories (subjects, spaces/agencies, discourses), and framing (*F*) to the communicative outcomes of the relations between categories in the context of the pedagogic relation (Figure 2). Framing between subjects refers to the control they have over selection, sequence, pacing, and evaluation criteria, that is, the discursive rules which regulate instructional pedagogic practice. It also refers to the hierarchical rules which regulate norms of social conduct, or regulative pedagogic practice.

Classification and framing refer either to relations within a given agency (internal *C* and *F*) or to relations between agencies (external *C* and *F*) and can vary according to different degrees of power and control in the relations between categories. Variations in classification and framing at various levels and in the coding orientation itself determine specific modalities of code. These modalities of code regulate specific pedagogic practices, either in the school or in the family. Classificational values in a pedagogic practice create specific recognition rules whereby students recognise the specificity of a particular context. If classificational values change from strong to weak, so do their contexts and recognition rules.

Framing values shape the form of pedagogic communication and context management. Different framing values transmit different rules for the creation of texts, whether these texts are instructional or regulative. Just as different classificatory values produce and expect different recognition rules on the part of the student, so different framing values produced by teachers or schools entail different realisation rules to be acquired by the student.

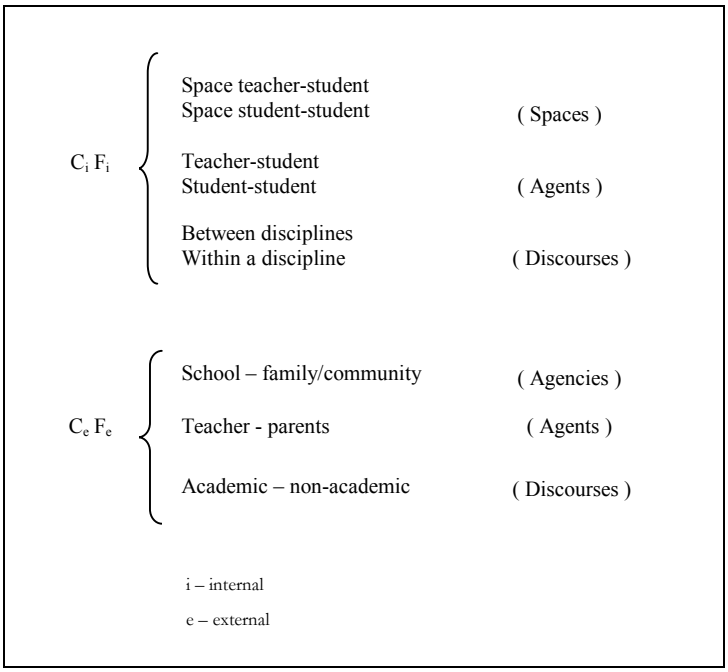

Figure 2—*Classification and framing relations.*

The classification and framing relations in school contexts presented in Figure 2 apply equally well to family contexts, provided we change teacher to mother/father, student to child, and disciplines to family knowledges. They also apply to teacher education contexts, exchanging teacher for trainer, student for teacher, parents for other agents, school-family/community for teachers' educational agencies/external agencies, and non-academic knowledge for teachers' practical knowledge.

Figure 3 presents pedagogic social contexts which have been the objects of our intervention and analyses. They have been mainly centred on school learning in general contexts and on science classrooms (Morais et al., 1992, 1993, 1996; Morais, Neves, & Pires, 2000; Morais, Neves, et al., 2000; Antunes, 1998), particularly in specific instructional and regulative contexts. The specific instructional contexts studied were problem solving (Morais, Fontinhas, & Neves, 1992; Ferreira & Morais, 1998, 2000), concept understanding (Afonso & Neves, 2000; Câmara & Morais, 1998), experimental

work (Matos, 2000), and assessment (Morais & Miranda, 1996). Outside the school, in informal education we have studied interactive museums (Botelho, 2000). The specific regulative contexts studied concerned social development through the learning of socio-affective competences (Morais & Antunes, 1994; Morais & Rocha, 2000). We have also developed a study to investigate the extent to which children were able to distinguish power and control relations in the classroom (Antunes & Morais, 1998).

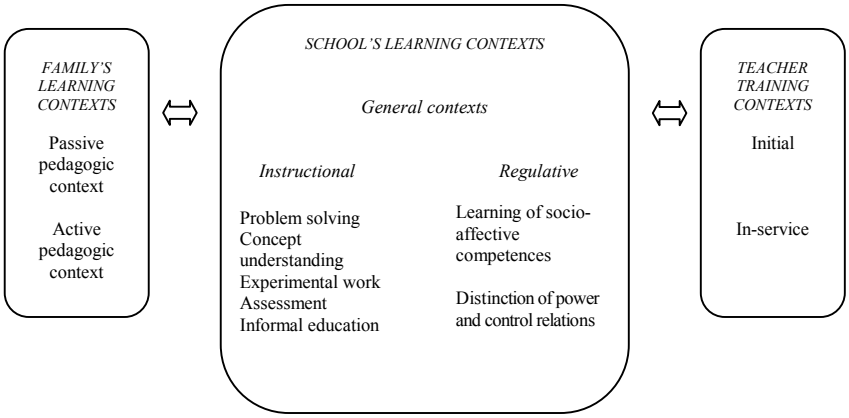

Figure 3—*Pedagogic social contexts: Intervention and analysis.*

Our studies of teacher training contexts were focused on both initial and in-service education. Analyses and intervention at the level of in-service education have always been closely linked with learning within action-research[2] projects (Morais et al., 1993, 1996; Morais, Neves, & Afonso, 2000; Rocha & Morais, 2000). Initial teacher training in science methods has been the object of continuous analysis and intervention at the level of the disciplines that we teach in the university. We are aware that, in this case, the results may be challenged on the grounds that, as researchers, we were also the objects of research.

Both passive and active family learning contexts have always been analysed in relation with school contexts (Morais et al., 1992, 1993; Morais & Neves, 1993; Neves & Morais, 1996; Pires & Morais, 1997a, 1997b; Afonso & Neves, 1998; Câmara & Morais, 2000).

Research Methodology: Developing an External Language of Description

School learning contexts

Pedagogic practices—Planning and characterization. Our planning for research on school learning contexts has always been carried out within action-research studies because we have wanted to analyse the implementation of pedagogic practices with given characteristics, in a process of interaction between theoretical propositions and empirical evidence. Pedagogic practices have also been studied where there has been no intervention, both in general and specific school and classroom contexts. We constructed instruments to refer to both instructional and regulative dimensions of learning, containing indicators for each relation between spaces, discourses, and subjects. A scale of classification and framing described power and control relations for each indicator. The instruments were always the result of previous observation and of our guiding theory modified by further observation. These changes included the introduction of new indicators whenever the text under analysis required more precision or revealed unexpected features. The number and type of indicators for each relation varied according to the context under analysis. We exemplify the analysis by presenting extracts from the instrument used for the planning of pedagogic practices in the general context of science learning at the primary school (Morais, Neves, et al., 2000; Morais, Neves, & Pires, 2001). The first (Table 1) refers to discursive rule evaluation criteria and the second (Table 2) to hierarchical rules. Each contains only one of the indicators used in the analysis of those rules. Each is followed by excerpts from classroom interactions where we indicate, within a 4 point scale of framing (F^{++}–F^{--}), their values.

Table 1: *Discursive rule—Evaluation criteria: Instrument of analysis*

INDICATOR	F ++	F +	F -	F - -
IN GROUP WORK PRESENTATION	The teacher systematically points out what is incorrect and indicates in a clear and detailed way what is missing in text production.	The teacher points out, in general, what is incorrect and indicates in a generic way what is missing in text production.	The teacher points out what is incorrect but does not clarify what is missing in text production.	The teacher accepts children's productions. Her questions are intended only to clarify those productions.

Examples

F_i^+ The teacher reads the answer of one of the groups about its members observation of water condensation and adds:

Teacher – Attention, you should *explain*… how do you explain the results obtained?

The children say that the results are a consequence "of heat", or "the temperature", or "the cooling".

Teacher – Yes, the lid cooled off… yes, go on… and then?… Attention, I want you to explain why the lid sometimes became dry and sometimes became humid… why?

Child – Because the temperature changed.

Teacher – Well, but explain that… because of temperature changes, but explain that (teacher finishes the discussion of this group's work).

F_i^- Children in groups attempt to answer a problem about how to handle a syringe so that liquid for injection may enter it. A child reads a group answer to the whole class:

Child – So that all the air comes out.

Teacher – Here it *says* "explain why". Only "so that the air comes out?!" But there we had to say something else (passing immediately to listen to another group's answer).

Table 2: *Hierarchical rules: Instrument of analysis*

INDICATOR	F ++	F +	F -	F - -
WHEN STUDENTS ASK QUESTIONS	The teacher ignores questions.	The teacher answers the student directly.	The teacher answers, asking questions and giving some information to help the student find the answer.	The teacher answers by promoting discussion between students and teacher in order to arrive at a conclusion.

Examples

F_i^{++} Children and teacher are correcting a question from a test.

Joana – May I give my answer?

The teacher ignores her question and asks Daniela:

Teacher – Daniela, why was there higher evaporation of the river's water?

Daniela – Because it was very hot.

Joana tries again. Since the teacher does not answer, she says:

Joana – I answered between 2 and 4 pm…

Teacher – The river's water heated and evaporated […] (ignoring Joana's intervention).

F_i - *Nelson* – […] I have one [doubt] […] but here with the syringe did not work [for the water to reach the outlet], I made it a while ago… it did not work to fill with the water because of the air inside […] but if we have a glass it works, with water?

Teacher – When you fill a glass up with water… doesn't the air come out when you fill it up with water?

Nelson – Yes, it comes out, but over there [in the syringe] a while ago it did not come out, why?

The teacher demonstrates with a syringe so that all children can see what happens when one tries to put water in a glass and in a syringe and says:

Teacher – Let us all pay attention to this, Nelson's question, let us see who is able to answer it.

All children participate in the discussion, giving explanations. But the question remains unanswered:

Nelson – Nelson's doubt is: Why can I introduce water in the glass […] and if I put it like this (demonstrates with the syringe) [the water] does not go into the syringe, does it? Why?

The children get involved again in the discussion and finally they get the right answer.

The same methodological procedure was used for planning and characterizing pedagogic practices in the specific regulative context of social competences. We held that learning specific regulative discourse is regulated by instructional practice and can be analysed in terms of discursive rules or selection, sequence, pacing, and evaluation criteria. The following extracts show part of the instrument used in the planning and characterising of pedagogic practice which guided the learning of given social competences of co-operation, respect, responsibility, and autonomy at the primary school level (Morais & Rocha, 2000) (Tables 3 and 4). The extracts refer to selection and evaluation criteria and contain only one indicator for each rule. Each extract is followed by examples of distinct degrees of framing (on a 4 point scale) in observed teacher-student interaction.

Table 3: *Discursive rule—Selection: Instrument of analysis*

	COMPETENCE AND INDICATOR	F ++	F +	F -	F - -
Responsibility	TAKING CARE OF CLASSROOM JOBS	The teacher arbitrarily chooses the children to carry out tasks.	The teacher looks at the task board and indicates every day who is going to do each task.	Some children remind others that they should look at the task board, so that each one of them does what he/she should.	Children look at the task board and do what they are supposed to do.

Examples

F_i^{++} When entering the classroom, Fábio and Vítor go to look at the task board.
Teacher – Hey, hey, kids! What are you doing ?!… Sit down!… I'll tell you who is going to do what!

F_i^{-} When entering the classroom Elsa, Fernão, and Joaquim go to the task board.
Elsa – Today is my turn to hand out the notebooks!… And Alberto is going to water the plants!
Fernão – I take care of the weather!
Joaquim – It is not my turn to do anything!

Table 4: *Discursive rule—Evaluation criteria: Instrument of analysis*

INDICATOR	F ++	F +	F -	F --
IN POINTING OUT THE LEGITIMATE TEXT	The teacher decides what the legitimate text of the specific regulative discourse is and tells children what it is.	The teacher refers to the agreed legitimate text which constitutes the standard according to which children will be evaluated.	The teacher, and children recall the legitimate text which constitutes the standard according to which children will be evaluated.	The teacher does not make any reference to the form and parameters according to which children will be evaluated

Examples

F_i^{++} Before starting group work, the teacher reminds the children:
– You should help each other, respect others' work and each one of you should do his/her part.

F_i^{-} The teacher indicates the task and asks the children:
– How do you think you are going to do it? How are you going to behave yourselves?
The class is silent. The teacher insists:
– Have you already forgotten?!
The class stays silent. The teacher says:
– You should do what I have told you.

Using these methods, it was possible to describe in great operational and theoretical detail the various sociological relationships which characterise the instructional and regulative dimensions of the pedagogic practice which occur in general and specific contexts of learning. Figure 4 shows an example of the results of the analysis of the relationships characterizing the

instructional context of two modalities of pedagogic practice implemented in science classrooms in the 5th and 6th years of schooling (ages 10^{-}–12^{+}) (Morais et al., 1996).

Figure 5 shows an example of the relationships suggested by the analysis of the regulative context of three modalities of pedagogic practice implemented in years 1 and 2, (ages 6–8) of primary school, for learning social competences (Morais & Rocha, 2000).

The studies which led to the characterization of the pedagogic practices referred to in Figures 4 and 5 were developed within action-research projects. They involved conceiving theoretical profiles of the pedagogic practices to be implemented; planning and organizing classroom activities and tasks accordingly; and observing using audio and video taping. Theoretical profiles were elaborated through a dialectical relationship between the empirical and the theoretical, where classroom observation to find appropriate relationships, indicators, and behaviours was carried out and profiles were changed as necessary. Such procedures at the level of classroom context contributed to the development of a model which both distinguishes and characterises the various relationships which define a given pedagogic practice.

Text production in specific instructional and regulative contexts. To study the instructional and regulative texts produced by children in specific contexts of learning we constructed a model (Figure 6) which shows the relations between specific coding orientations and socio-affective dispositions in text production. The interrelation shown in the model between specific coding orientation and socio-affective disposition is intended to highlight their mutual influence. Although constituting different realities within the subject, the possession of a specific coding orientation may be limited by socio-affective dispositions, which are in turn limited by coding orientation.

According to Bernstein (1990), text production in a given context depends on the possession of the specific coding orientation to that context. This means that subjects must have both the recognition rules, that is, be able to recognise the context, and the realisation rules, that is, be able to produce a text adequate to that context. Realisation rules concern both the selection and the production of meanings. Subjects must select adequate meanings and produce texts according to them, in this way showing correct performance in context, demonstrating possession of both recognition and realisation rules.

	RELATION BETWEEN SUBJECTS TEACHER-STUDENT (Ci Fi)					RELATION BETWEEN DISCOURSES (Cie Fe)	
		CONTROL RELATIONS (Fi)					
PEDAGOGIC PRACTICES	POWER RELATIONS (Ci)	Discursive rules SIP				Academic-non-academic knowledge (Ce Fe)	Knowledges within the discipline (Ci)
		Selection	*Sequence*	*Pacing*	*Criteria*		
P1	Ci $^{++}$	Fi $^{+}$	Fi $^{+}$	Fi $^{--}$	Fi $^{++}$	Ce $^{++}$ Fe $^{-}$	Ci $^{-}$
P2	Ci $^{+++}$	Fi $^{++}$	Fi $^{++}$	Fi $^{+}$	Fi $^{+}$	Ce $^{++}$ Fe $^{+}$	Ci $^{-}$

i – internal
e - external

Figure 4—*Power and control relations in the instructional context of two pedagogic practices (5th and 6th years of schooling).*

PEDAGOGIC PRACTICES AND TEACHERS	RELATION BETWEEN SUBJECTS TEACHER-STUDENT (Ci Fi) POWER RELATIONS (Ci)	CONTROL RELATIONS (Fi) Discursive rules SIP *Selection*	*Sequence*	*Pacing*	*Criteria*	Hierarchical rules SRP	RELATION BETWEEN SPACES (Ci) Teacher-student spaces
P1 *YV*	Ci^{+}	F_i^{-}	F_i^{--}	F_i^{--}	F_i^{++}	F_i^{--}	C_i^{--}
P2 *XZ*	Ci^{+}	F_i^{+}	F_i^{--}	F_i^{--}	F_i^{+}	F_i^{-}	C_i^{-}
P3 *T*	Ci^{++}	F_i^{++}	F_i^{--}	F_i^{--}	F_i^{-}	F_i^{++}	C_i^{+}

i – internal
T, V, X, Y, Z - Teachers

Figure 5—*Power and control relations in the regulative context of three pedagogic practices (1st and 2nd years of schooling).*

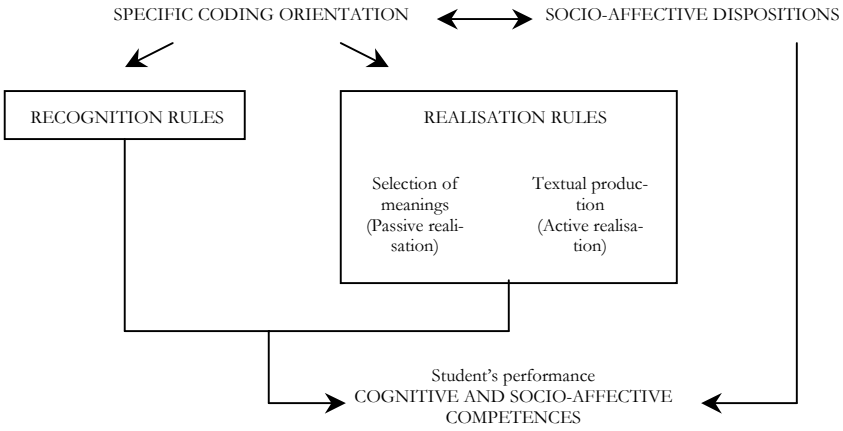

Figure 6—*Cognitive and socio-affective competences as given by coding orientation and socio-affective dispositions specific to the context.*

Failure to show performance may indicate lack of recognition or realisation rules or both. As to realisation rules, subjects may not be able to select meanings or produce them or both. If they are able to select meanings but are incapable of producing the text, we say that they have a passive realisation. If the text is produced, they exhibit active realisation. However, for text production to be accomplished, subjects must also possess socio-affective dispositions specific to the context, that is, they must have the appropriate aspirations, motivations, and values. According to Bernstein, recognition rules regulate realisation rules. Both principles and the requisite socio-affective dispositions are socially acquired and become part of the subjects' internal structures.

Exemplifying these relations among the cognitive competences required in specific classroom contexts, we would say that students receiving a pedagogic practice which requires, for instance, problem solving competence, succeed by (a) recognising the specificity of the micro-context of problem solving within their practice (recognition rules); (b) selecting meanings adequate to that micro-context, that is, knowing how to proceed to solve problems correctly (passive realisation); (c) producing the text, that is, presenting a correct solution to the problem (active realisation); and (d) possessing socio-affective

dispositions favourable to that realisation (motivations, aspirations, values). In the case of socio-affective competences, students receiving a pedagogic practice which requires, for instance, the competence of co-operation, succeed if they (a) recognise the specificity of the micro context of co-operation within the regulative context of their practice (recognition rules); (b) select meanings appropriate to that context, that is, know what should be done to achieve co-operation (passive realisation); (c) produce the text, that is, co-operate according to the rules of the classroom (active realisation); and (d) have socio-affective dispositions towards that realisation (motivations, aspirations, values).

In these terms, a relation of continuity is established between family and school whenever an elaborated orientation is present in the former and both practices are convergent in terms of the classification and framing relations present in their socialisation processes. However, a relation of discontinuity is not a necessary condition of children's school failure, that is, it is not a condition of non-recognition and non-realisation in the school-specific contexts in which students are evaluated. Specific characteristics of school pedagogic practices can be favourable for the acquisition of the recognition and realisation rules underlying the development of cognitive and socio-affective competences, such as those required in the science classroom (Morais, Fontinhas & Neves, 1992; Morais & Câmara, 1997; Morais & Rocha, 2000).

We studied the acquisition of recognition and realisation rules in science classrooms in the specific contexts of problem solving, concept understanding, assessment, and experimental work, as well as in informal education and at the level of specific regulative context. We wanted to find out whether students possessed the specific coding orientation needed to produce texts adequate to given micro-contexts of scientific and social learning. For these analyses we developed instruments conceived in terms of the specificity of the micro-context under analysis and of the text to be produced. The instruments took the form of open and/or closed questionnaires and were administered to children at interviews. Children were asked to group objects (pictures, sentences, etc.), to choose between several answers, or to produce free answers. Through these various methods we obtained the degree of children's specific coding orientation.

To illustrate the methodology followed in analysing students' recognition and realisation rules, we present examples from science learning of instruments constructed for problem solving, concept understanding and assessing. The first refers to the 6th year of schooling (ages 11^{-} –12^{+}), the second to kindergarten (age 5), and the third to the 5th year of schooling

(ages 10^{-} –11^{+}). In the examples which follow, we refer to the instruments' general structure and we indicate the correspondence we have established between the type of questions they contained and their meaning in terms of recognition and passive and active realisation rules. We also give examples of the empirical analysis which showed that correspondence.

Problem solving. The instruments constructed to analyse the specific coding orientation in the micro-context of problem solving followed the same general pattern; they contained problematic situations whose solution required the use of scientific knowledge previously acquired. For each question, there was a free answer and a multiple choice question. In some studies (Morais, Fontinhas & Neves, 1992), the instruments allowed only analysis of the possession of recognition and realisation (passive and active). Further studies (Ferreira & Morais, 1998, 2000; Morais, Neves et al., 2000) also permitted discrimination of recognition in terms of the scientific knowledges and competences involved in the micro-context of problem solving.

The example which follows refers to one of these more recent instruments, which took the form of a questionnaire (Ferreira & Morais, 1998, 2000). The free question was intended to find out whether children possessed active realisation (*RLa*), the multiple choice question to find out if children who did not produce the correct text in the free answer were capable of passive realisation (*RLp*) or not and, in this case, if they possessed recognition either of scientific knowledge (*RCk*) or of the competence (*RCc*) involved in the problematic situation. Scientific knowledge might be only partially recognised (*RCk*$^{-}$).

Questionnaire

Problematic situation:
You have noticed that to remove the mist of the car windows we only have to switch on the heating system for a while.

Free question: Explain this situation on the basis of the knowledge acquired in your science classes (*RLa*).

Multiple choice question: Mark with an X the answer you think most adequately explains the situation:

A. The surrounding water vapour loses energy when it is in contact with the glass and passes to the liquid state and this makes it become misty (*RCc*).
B. Vapourisation is the change of a body from the liquid state to the gase-

ous state when it gains energy by heating (*RCk*).

C. The window's mist gets away because it is hot and this makes the water that is on the windows disappear (*RCk -, RCc*).

D. The drops of water, which make the windows become misted, gain energy when heated and pass to the gaseous state so that the windows become demisted (*RCk, RCc, RI-p*).

Children are shown to possess active realisation (*RI-a*) when they give a text of option D type in answer to the free question.

To determine students' specific orientation to problem solving, we followed a complex methodology which cannot be explained in the space available here. All the texts produced by students were analysed according to a system of categories we created for both recognition and realisation rules. Numeric scales were attached to these categories.

Concept understanding. Our example (Morais & Câmara, 1997) was inspired by Holland's study (1981), designed to analyse text produced about understanding the concept of *insect*, explicated in terms of the principle "number of legs". The instrument contained four questions based on three sets of six pictures each concerning insects, arachnidae and miriapodae. The first question established whether or not children had recognition (*RC*) and active realisation (*RI-a*). In the second question, the context was given and children were probed for passive realisation (*RI-p*). If they were not able to achieve passive realisation, the context was orally identified and they were taught how it should be done, in order to change their specific coding orientation by giving them the appropriate recognition and realisation rules. The third question sought active realisation (*RI-a*), while the fourth was similar to the first question, seeking to find out if the children already recognised the context (*RC*) and could actively realise legitimate text (*RI-a*).

Interview

1. The interviewer gives six pictures of 6 animals[3] to the child.
   Interviewer – Look carefully at these animals. Make groups with these animals, placing them in the boxes. Make the groups you wish. There are many boxes, use those you wish. Why did you group (place) the animals in this way? (RC; RI-a)

2. The interviewer takes out the same pictures and makes three groups herself, using the principle, "number of legs". (If the child has already used this principle in the first question the interview proceeds to question 2.2.).

2.1 *Interviewer* – Look carefully at the groups I made. Find out why these animals are grouped in this way. (*RLp*)

If the child answers correctly, the interview proceeds. If not, the interviewer explains the reason for the grouping, using reception learning.

2.2. The interviewer gives the child six pictures of six other animals with the same characteristics[4] as those in question 1.

Interviewer – Look carefully at these six animals. Place each one of them in one of these groups I made. Explain as you go along. (*RLa*)

The pictures are then removed.

3. The interviewer gives the child six pictures of six other animals with the same characteristics as those used in questions 1 and 2.

Interviewer – Look carefully at these six animals. You are now going to make groups again in these boxes as you wish. (*RC; RLa*)

On this basis we obtained a relative value for each child with respect to the acquisition of recognition rules, realisation rules, and specific coding orientation. These values represented a measure of scientific achievement with respect to the concept of *insect*. We constructed a 4 point scale which measured an increasing degrees of the specific coding orientation for the micro-context of concept understanding.

Assessing. The instrument we constructed to analyse recognition and realisation rules in the assessing context (Morais & Miranda, 1996) took the form of a semi-structured interview. In the first part of the interview, we sought to analyse recognition rules (*RC*). We wanted to see if students could recognise the basic principle in marking (grading) test answers, distinguishing between *correct* and *incorrect*. In the second part, we sought to elicit their realisation rules (*RL*). Did students reproduce their teacher's text when correcting and marking? The questions asked related to tests which had already been given to children; one of these tests assessed factual knowledge, a second assessed concept understanding, and a third assessed the use of knowledge in new situations. Answers to each, covering the widest possible range of teachers' marks, were considered.

Interview

First stage (RC)

1. The student is given the first question and a set of 10 answers to it.
   Interviewer – Here is a question from the test made by your teacher and 10 answers given by some of your classmates to that question. Please group the answers as you wish.

2. Students are asked to indicate the answers in each of their groupings (through the notation A_1, A_2…) and to explain the reason for each grouping.

3. The second and third questions and sets of answers are presented, and for each question, procedures 1 and 2 are repeated.

Second stage (RL)

4. Students are again given the first question, the "correct answer" and mark value, and a set of 5 answers.
   Interviewer – You have here the first question you were given before, and this is a correct answer. You are going to take on the role of your science teacher, correcting and marking the tests. These cards are for you only, so you can write whatever you wish on them.

5. Students are then asked to justify the mark they gave for each answer and to explain the meaning of the notations they have made.

6. The second and third questions and their values are given, and for each one, procedures 4 and 5 are again followed.

In order to analyse recognition rules, we organised the texts produced by students in the first stage of the interview according to categories, based on previous analysis of their text to the "why" of answers group formation, distinguishing acquisition and non-acquisition. The following examples show the meanings and categories assigned to students' texts when explaining group formation. We show, for two students, the groups they made and the reasons they gave:

Category: The student groups according to the degree of similarity of the answers.
DOES NOT POSSESS RECOGNITION RULES

Student's text
First group: A_1 and A_6 because they are similar.
Second group: A_2 and A_{10} because they are equal.
Third group: A_4, A_7 and A_8 because they tell the same thing.

Category: The student groups according to the correct/incorrect criterion, with intermediate degrees.
POSSESSES RECOGNITION RULES

Student's text
First group: A_1, A_3, A_4 and A_9 because I think these are the ones which are right.
Second group: A_2 and A_6. These are also right, but for me the most right are these four (the answers of the first group).
Third group: A_5, A_7, A_8 and A_{10}. These are what I think is not right.

In analysing realisation rules, categories were similarly constructed, on the basis of a previous analysis of students' answers, the mark value given, and teachers' notations to answers, again distinguishing acquisition and non-acquisition.

Category: Student values an answer (or part of it) which is out of context.
DOES NOT POSSESS REALISATION RULES

Student text
Does not answer the question, but is appropriate to another question.

Category: Students give the same mark as teacher's.
POSSESSES REALISATION RULES

Student text
For correct answers: It means the same as the answer provided in different words.
For incorrect answers: It does not make sense.
For partially correct answers: The answer is not finished, it does not tell… (student explains).

We determined the degree of acquisition of recognition and realisation rules by numeric scaling of categories. We then determined the specific coding orientation of each student, for the micro-context of assessing, through a composite index from recognition and realisation.

Teacher training contexts

We used the same kind of conceptualisation for teachers' educational contexts (Morais, Neves, & Afonso, 2001; Rocha & Morais, 2000) as for school learning contexts. We present extracts from the instrument used to plan and characterise researcher-teacher relationships in one of our action-research studies (Morais, Neves, & Afonso, 2000) (Tables 5 and 6). They correspond to the same rules that we gave for teacher-children relations

(see above). Each extract is followed by examples of researcher-teacher interactions where degree of framing is measured on a 4 point scale.

Table 5: *Discursive rule—Evaluation criteria: Instrument of analysis*

INDICATOR	F ++	F +	F -	F - -
TASKS TO BE CARRIED OUT	During the discussion, the researcher makes clear not only the objective of the task but knowledges and also the paths to be used.	During the discussion, the re-searcher makes clear the objective of the task, without detailing knowledges and paths to be used.	During the discussion, the researcher raises questions about ways of dealing with the task and about its solution.	During the discussion, the researcher accepts any form of dealing with the task and also accepts multiple solutions.

Examples

F_i^+ Teachers are planning an experiment to test the hypothesis of the relationship between the amount of lichen covering trees and the distance of those trees from the town. Some teachers propose experiments whose procedures and results are not in accordance with the hypothesis. The researcher recalls it and discusses, in general terms, whether the procedure is appropriate to obtain the information needed.

F_i^- Teachers give several examples of successful and unsuccessful experiences they have had with their children. They speak about possible causes and diverse strategies which they have used to solve problems. The researcher listens to the various reports and poses some questions which aim at better understanding of the situations reported.

Table 6: *Hierarchical rules: Instrument of analysis*

INDICATOR	F ++	F +	F -	F - -
IN THE RELATION OF COMMUNICATION	The researcher privileges a vertical and unidirectional relation of communication.	The researcher promotes a vertical and unidirectional relation of communication, with occasional intervention of teachers.	The researcher promotes researcher-teacher communication but the vertical relation is also frequent.	The researcher privileges a permanent communication between researcher and teachers.

Examples

F_i^{++} Teachers and researcher analyse the problem of school success/lack of success. The researcher shows a transparency with three graphs. She starts by describing the data given in the first graph. She goes on to describe the data in the second graph. Finally she describes the data in the third graph. The teachers follow attentively.

F_f - All teachers group the leaves of various plants according to their own personal criteria and compare them with those of their colleagues. They verify that they have used similar criteria (colour, texture, size). They refer to their use of leaves in various activities (in the study of the seasons of the year, in arts…). Afterwards, a dychotomic key is given. The teachers engage in a lively discussion when they find out that their criteria do not coincide with scientific criteria. They discuss why this happens: Some teachers do not accept that colour is not an important criterion for classifying, while others find justifications for the fact that the criteria they used are not valued in the scientific context.

Family learning contexts

The studies directly centred on the family (Morais & Neves, 1993; Neves & Morais, 1996; Pires & Morais, 1997a, 1997b) have followed a model (Figure 7) which, starting from Bernstein's concept of pedagogic code, sought to illuminate relationships between the discourses and practices of family and school.

In this model the pedagogic code of the family is analysed at two levels which, although interlinked, are taken as separate components of realisation code at discursive and transmission levels. Analysis of the discursive level, which refers to both family instructional discourse (FID) and family regulative discourse (FRD), is focused on knowledges/activities and norms of social conduct present in the family. Through an indirect pedagogic practice (IPP), children, as spectators of the discursive universes of the families, learn (in a non-evaluative context) to value the meanings transmitted by parents' instructional and regulative discourses. Analysis of the transmission level, which refers to the realisation of families' pedagogic discourses, that is, to the instructional and regulative practices of families, focuses on the process of transmission-acquisition developed by parents in pedagogic interaction with their children. Through a direct pedagogic practice (DPP), children as active participants in the learning process, acquire (in an evaluative context) specific skills and norms of social conduct, in social roles which determine how they behave in other contexts of learning. The contextual realisation of meanings is established by using the values of classification and framing which define the pedagogic code. The model also considers coding orientation (elaborated or restricted), the meanings which are present in the family's discourses and practices. At the level of the contextual realisation of meanings, it directly considers the communicational dimension of the pedagogic code and also, indirectly, its organisational dimension.

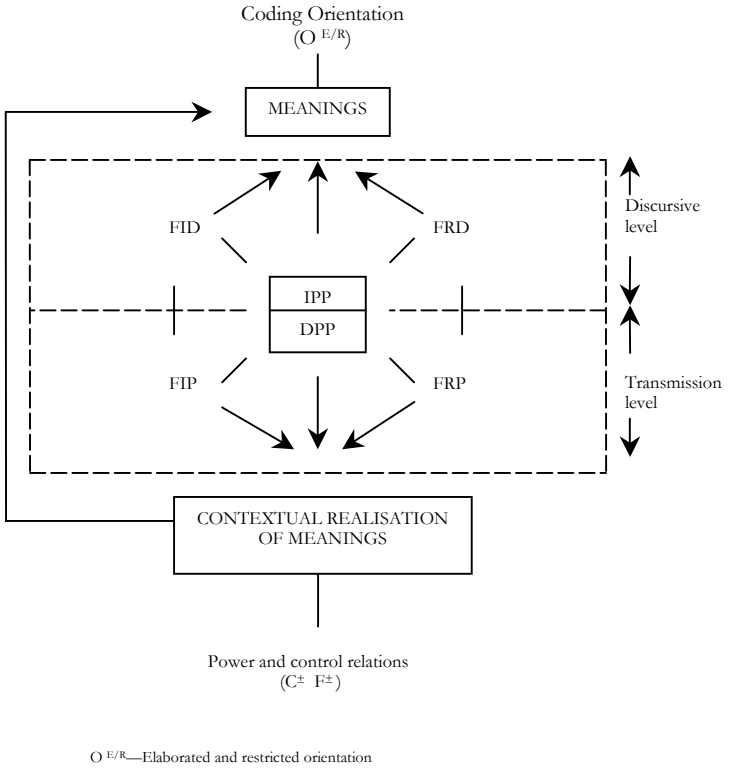

Figure 7—*Theoretical model of family's pedagogic code.*

On the basis of the concept of pedagogic practice defined in the model (Figure 7), it was possible to derive the following dimensions of empirical analysis:

1. the knowledge/activities and norms of social conduct which are present in families' everyday lives;

2. the principles adduced by parents as underlying the knowledge/activities and norms of social conduct which they value;

3. the form used by parents to transmit their knowledge and norms of social conduct and to explain tasks to children;

4. the modality of social control used by parents in their communicative relations with children;

5. the form in which pedagogic spaces and materials are organised at home; and

6. the principles adduced by parents as underlying the ways they teach their children.

Dimension 1 refers to the discursive universe of the family and provides data both about the relative importance given at home to manual and non-manual tasks and to academic-non-academic knowledges (instructional discourse) and also about the positional/interpersonal nature of the relations of social conduct according to age, gender, and parental status (regulative discourse). Dimensions 2 and 6 give the coding orientation of the family, providing data about the particularistic and universalistic nature of the meanings underlying its general form of communication (dimension 2) and the meanings underlying the form according to which parents teach their children (dimension 6). Dimension 3 refers to the theory of instruction valued by the family, providing data about the discursive rules (selection, sequence, pacing, evaluation criteria) which regulate the process of transmission-acquisition in the family instructional context. Dimension 4 refers to the form of communication privileged by parents in their social relations with children, providing data about the hierarchical rules which regulate the modality of control in the family regulative context. Finally, dimension 5 refers to the organizational dimension of the pedagogic code, providing data about the characteristics of the local pedagogic space.

To analyse pedagogic practice in the family context, we took the text produced by parents in an interview situation. The instrument guiding the interview contained a set of propositions and research questions refined in pilot interviews. Classification and framing scales used in the characterization of family's pedagogic practice were similarly constructed. An interview guide was constructed, to be administered to parents, and the results of the interview gave answers to research questions.

In order to show the form taken by the analysis, we present the part of the instrument (propositions and research questions) which referred to the

characterisation of discursive rules selection and evaluation criteria and hierarchical rules (Neves & Morais, 1996), with illustrative extracts, indicating the degree of framing on a scale of F^{+++} to F^{---}.

Discursive rule—Selection

Proposition: At home one may only say/do given things or one may say/do anything one wants.

Research question: Do children only say/do what is established by parents, or do they say/do what they want?

Examples:

F_i^{+++} […] he likes painting (the house walls) very much but cannot be allowed to do so… I don't let him (the son) paint.

F_i^{---} He [the son] tried to make an omelette his way … we even thought it was good he had initiative… because I think he should also take initiatives […]

Discursive rule—Evaluation criteria

Proposition: At home there may be established or free ways to say/do various things.

Research question: Do children say/do things in the way that parents establish is correct or do they say/do things in the way they themselves think is correct?

Examples:

F_i^{+++} I taught him… the fork should be placed on this side, the knife on this, the napkin on this side outside the plate, the bread is placed in the saucer… It must be laid in this way according to hotel service standards.

F_i^{---} […] The way she [the daughter] tidies up [the toys] for me is not important… The way she tidies up is something personal…

Hierarchical rules

Proposition: For controlling what children can say/do and how they say/do it, parents use control modalities which can be based on their authority or on each child's attributes.

Research question: How do parents tell their children that they should only say/do things already accorded and how do parents tell their children the way they think it is correct to say/do things? By explaining

the reasons why they should or should not say/do given things and explaining the reasons why they should say/do things in a given way? Or simply telling them that they cannot say/do given things in the way they want and that they must say/do things in the way parents consider as correct?

Examples:

F_i^{+++} I beat her up and say she must pay more attention… if I am not to beat her up again.

F_i^{--} […] For I tell him that I… daddy likes the fact that he has passed the year and has good results, that is good for him and I am pleased.

Synthesis

These examples of models, instruments, and interactions show how we have operationalised the concept of pedagogic practice and, particularly, the concepts of framing and discursive and hierarchical rules. These concepts are part of Bernstein's internal language of description. The models/instruments and the dimensions they contain, as well as the indicators and their descriptions in terms of various framing degrees, are the external language of description for a specific context. The examples of interactions are the empirical data. In constructing the models and instruments, we held empirical evidence and theoretical principles in dialectical relation. Transcripts were analysed on the basis of previous theory and models/instruments constructed and successfully transformed on the basis of empirical data. Through this process, the internal language of description underwent changes as a result of the empirical analysis.

The following are examples of this active methodological process related to classroom analysis. When everyday knowledge enters the classroom it could be considered as a weak framing of the selection. However, our empirical evidence showed that everyday knowledge can be brought in not only by children but also by teachers. In the first case framing of the selection would be weak and in the second strong. However, in both cases, classification and framing are weakened between academic and non-academic knowledges. That methodological process is also exemplified when, in correcting and marking a test, a teacher makes clear to each child what is missing in child's text. While this is rightly viewed as strong framing of evaluation criteria, there is in this case a simultaneous weakening of framing at the level of hierarchical rules as reasons are explained to students through a personal mode of communication. To give another example, when the

teacher conducts a discussion in the classroom in order to lead children to a given concept, the selection is strongly framed at least at the macro level but framing is weak at the level of hierarchical rules in the relations between teacher-student and student-student.

Further example from classroom analysis also highlights how articulations between the theoretical and the empirical permitted the development of an external language of description which gave a higher degree of applicability to the internal language of description. We held that there is a specific regulative discourse for which there is an instructional pedagogic practice regulated by discursive rules of selection, sequence, pacing, and evaluation criteria, so that we characterised the transmission-acquisition of social competences in the same way as cognitive competences and processes. This definition of indicators was aimed at allowing the theoretical propositions which guided the characterisation of distinct modalities of pedagogic practice to come into relation with initial empirical data.

The fact that the instrument for guiding the analysis of families' practices and discourses was conceived on the basis of a model equally applicable to schools made possible the characterisation of families' practices and discourses in terms of their relationship with the school pedagogic context. In similar manner, trainer-teacher relations were characterised and also related to the modality of pedagogic practice privileged by teachers in their relations with children. Both sets of relations also show how the development of an external language of description contributed to the development and transformation of the internal language of description, and make evident the explanatory diagnostic and transferability power of the theory which guided the research.

The concepts of recognition and realisation rules provided by the theory have achieved a more extensive and broader meaning on the basis of empirical evidence and application in distinct contexts of textual production. The development of an external language of description has allowed a deepening of analysis at the level of textual production in both general instructional and regulative contexts and in specific micro-contexts of scientific and social learning. Good examples of this have been seen in the analysis of textual production in distinct learning contexts; in the definition of indicators to differentiate between the two components of realisation (passive and active); and in the instructional micro-context of problem solving, not only in the recognition of content (knowledge) but in the recognition of competence. While enriching and broadening the conceptual language, the research carried out at this level has also revealed the importance of an ex-

ternal language of description for activating the internal.

Examination of the relation between discourses encompassed distinct disciplines (interdisciplinarity), school and family-community knowledges (academic/non-academic), and between knowledges within a given discipline (intradisciplinarity). This last relation is not taken into account or worked out in common discourse relation analyses. Weak classification at the level of intradisciplinary knowledges means a close relation between those knowledges, that is, a relation between concepts of distinct specificities and orders in the direction of higher levels of conceptualisation and consequently more meaningful scientific learning. The consideration of the classification between concepts of a given discipline also means an extension of the internal language of description.

Final Considerations

An important aspect of our research concerns the models constructed in various studies to analyse pedagogic contexts and texts. These models made possible analyses at distinct levels and in many situations of learning and interaction. The models also revealed their potential to guide the planning of pedagogic practices and interactions and to evaluate their outcomes. This was made possible by the strong conceptual structure and explanatory power of the theory on which the research is based. The explanatory power of Bernstein's internal language of description has allowed us to use the same concepts in contexts as diverse as family, school, and teacher education to broaden the relationships studied and conceptualise the results at a higher level. However, much is still to be done in terms of operationalisation, in terms of greater precision of the indicators of each aspect of pedagogic interaction and its outcomes, and at the level of concrete and specific directions for teachers' and trainers' practices.

Through the development of a constructive external language of description, based on the relationship between Bernstein's concepts and the data suggested by empirical analyses, we followed a research methodology which made evident the diagnostic, predictive, descriptive, explanatory, and transferability potential of the theory. It has been possible, on the basis of the concepts and relations suggested by the theory, to make a *diagnosis* of the kinds of experimental work done by teachers in their classrooms and the kinds of family modalities of control; *predict* situations of school success or failure both on the basis of continuity or discontinuity of relationships

between family and school discourses and practices and also on the basis of the relationship between the characteristics of teachers' pedagogic practice and the acquisition of the recognition and realisation rules needed for the production of the instructional and regulative texts required by the school; *describe* pedagogic practices in family and school and in teacher training; and *explain* reasons associated with families and schools for the success or failure of children from the same and different social groups and variations in the family's coding orientation within lower social groups. It has also been possible to explore the *transferability* of the theory, for example, when we apply to the analysis of family learning and teacher training contexts the concepts and relations used in the analysis of school learning contexts. The transferability power of the theory is also evident when we develop the analysis of transmission-acquisition of specific regulative discourse by applying concepts associated with instructional practice of specific instructional discourse, as well as in the characterisation of family pedagogic practices and teacher training processes by using the model developed for characterising school pedagogic practices. The external language of description we have developed has contributed to the activation of Bernstein's internal language.

Our research *as a whole* has shown how specific power and control relations in classrooms and in schools lead to differential access to recognition and realisation rules which regulate the multiple contexts of pedagogic interaction. These relations also lead to differences in socio-affective dispositions. Children's success in school, in scientific and social learning, requires the acquisition of recognition rules which permit them to distinguish the specificity of the multiple micro-contexts where that learning takes place and of realisation rules which enable the selection of legitimate meanings for each micro-context and the production of text appropriate to it. Studies developed outside specific learning contexts and focused on more general school contexts and curriculum organization (Daniels, 1989; Holland, 1981; Whitty, Rowe, & Aggleton, 1994) have also shown the importance of these processes. When family codes and practices are in continuity with school pedagogic codes and practices, acquisition of the recognition and realisation rules appropriate to school contexts is facilitated by the elaborated orientation brought in by children. Similar power and control relations in the family and the school permit more efficient access to recognition and realisation rules in school contexts. This immediately gives an advantage to children whose processes of primary socialisation are regulated by pedagogic codes similar to school codes. In general, these children tend to come from

higher social or dominant ethnic groups.[5] However, this situation can be altered by school pedagogic practices whose characteristics permit access to the school coding orientation. Teachers' acquisition of the recognition and realisation rules and socio-affective dispositions appropriate to the implementation of such pedagogic practices is crucial for such change.

The aspect which is revealed to be most crucial in the research we have carried out is the explication of evaluation criteria, that is, the presence of a strong framing at the level of this discursive rule. Such explicitness, which in our studies was achieved by making clear to children the specificity of a given context and what needed to be added to their textual production for it to be correct in both transmission and evaluation contexts, seemed to help them in acquiring both recognition and realisation rules. However, for evaluation criteria to be explicated by the teacher, time is necessary, that is, a *weak framing of pacing* is needed. At the same level, a correct textual production requires not only the possession of recognition and realisation rules but also positive socio-affective dispositions, motivations, and values towards the text to be produced. Weak framing at the level of hierarchical rules, that is, personal control in an open relationship with children, where reasons for contents, competences, and procedures are explained and discussed, tended to produce acceptance and enjoyment by children of the contents, competences, and procedures developed in their classes. Such relationships tended, when the text was constructed with students, in turn, to influence the acquisition of recognition and realisation rules in which children developed a greater degree of involvement. Such acquisition was also influenced where weakening of the classification and framing between academic and non-academic contexts occurred. When teachers introduce examples of everyday situations and these are explained on the basis of school knowledge, they provide simultaneous access to both contexts and, implicitly, introduce the principles which permit distinction between those contexts. Continuous access to both is likely to enable students to construct recognition rules. When teachers accept and integrate examples brought by children (weakening of framing in selection), such construction is also greatly facilitated. This, of course, can only occur if the criteria are clearly explicated, for to weaken the strong classification and framing present in the socialisation of disadvantaged children between academic and non-academic contexts constitutes a considerable step, not always easy for those children. What we did, in fact, was to make clear the strong classification between the two contexts and their specificity. It should be noted that the weakening of framing, at the level of micro-level selection and, even more,

at the level of hierarchical rules, carries with it the raising of children's position or status, which is also a condition for success at school.[6] Only a pedagogic practice which takes into account *all* children can contribute to a higher status for disadvantaged children.

Explaining evaluation criteria, together with the weakening of framing at the level of hierarchical rules, either in the context of transmission or in the context of evaluation, constitutes, from a sociological perspective, an innovative strategy. To give children access to the principles which direct all of teachers' actions, to make visible an usually invisible message, means to give them the possibility of challenging teacher-student power relations. And if this message is more invisible for disadvantaged children, a pedagogic change in that direction is a considerable change, for it leads to forms of equality in school and society.

Contrary to what is argued by many progressive educationalists (e.g., Montessori and Klein, cited in Bernstein, 1977, p. 131), as to the potentialities of a totally invisible pedagogy characterised by weak classifications and framings (as in the case of the open school), our studies so far show that while these weak classifications and framings are an essential condition for learning at the level of pacing, hierarchical rules, knowledge relations (interdisciplinary, intradisciplinary, academic-non-academic), and relations between spaces, they are less so at the level of selection (at least at the macro level) and, certainly, at the level of evaluation criteria. This conclusion does not support either a return to the traditional education of strong classifications and framings or a total acceptance of progressivism. Rather, it suggests a *mixed pedagogy*, a prospect suggested by the language of description derived from Bernstein's theory enabling distinction between specific aspects of classroom social contexts, going well beyond the dichotomies of open/closed school, visible/invisible pedagogies, and discovery learning/reception learning, introducing a dimension of great rigour into research on teachers' pedagogic practices.

In defence of some educators committed to a pedagogic code characterised by weak classifications and framings, it is possible that a fundamental confusion exists between regulative and instructional contexts, particularly between the hierarchical and discursive rules which regulate the regulative and the instructional practices in the classroom. If a weakening of framing at the level of hierarchical rules and a weakening of classification at the level of the relations between spaces seem to be clearly favourable to students' learning (to have access and have the opportunity to discuss teachers' reasons and to acquire a high status), the weakening of the fram-

ing of evaluation criteria and even of selection leaves children who entered school in disadvantage more disadvantaged—there is a text legitimised and valued by school and by society to be learned and *all* students should have access to that text. Only by explicating evaluation criteria and having control over selection (at least at the macro level) can teachers lead children to understand what is required from them.

The conclusions reached in our studies focused on scientific learning are complemented by research which highlights the importance of learning social competences, pointing to the need to start such undervalued processes in the first years of schooling. The importance of promoting children's personal and social development in school, in order to prepare them for contexts related to citizenship, mutual respect, co-operation, and freedom, renders serious reflection and a grounded intervention indispensable in the hope that differential pedagogic practices may enhance development. As with scientific learning, the pedagogic practices more favourable to the social learning of disadvantaged children do not point to generally weak classifications and framings. Such practices leave the text legitimised by the school and society invisible, increasing the differences marking children of distinct social and cultural backgrounds on entering school. Pedagogic practices can be changed in order to obtain better school results, particularly with children of disadvantaged social groups; without such educational innovation, schools institutionalise inequalities in the acquisition of the discourses of power and in access to the power of the discourse.

Our research also contributes to a better understanding of family factors which explain the general failure of socially disadvantaged children. The studies make clear that there are fundamental differences within the working class which are reflected in children's primary socialisation and which, in turn, reflect on their actions at school. The studies can lead schools and teachers to understand how some children succeed and others fail. We believe that teachers' knowledge of primary socialising discourses and practices may give them a clearer vision of the causes of success and failure of children from lower social backgrounds and enable teachers to act in a more explicit and efficient way in classroom contexts to improve such children's learning. Our reading of our results and conclusions does not allow us to condone schools' inaction. On the contrary, our reading impels us to think about *how* and *where* the school should intervene. We believe that there is an urgent need for more studies of primary socialising processes, to improve thinking about school-family relations and to enable us to act more successfully at the level of secondary socialisation, particularly in the

early years of schooling.

Pedagogic innovation is possible whenever teachers undergo a process of professional development where they have access to an education which promotes the acquisition of recognition and realisation rules and socio-affective dispositions appropriate to implementing such acquisition. Pedagogic change may result from joint work between teachers and researchers, provided we manage to transmit to teachers the idea that they have more power and competences than they currently believe they do. They have, in many respects, "a considerable space available for the *how* of school learning, that is, for pedagogic practice and its realisation. It is possible that the how of the acquisition is more important than the what; in fact it may even model the what" (Morais et al., 1993, p. 519).

Finally, we want to make clear that although we consider that the studies we have carried out and the research methodology we have used have important potential in the field of educational research, pedagogic intervention, and teacher education, we are aware of their limits. It is work to be continued.

Notes

1 The work we have been developing also includes analyses of textbooks and syllabuses (see chapter 9 in this volume).

2 The concept of action-research that we have used in our studies differs in many aspects from perspectives which consider it as a weak classification and framing researcher-teacher relation. We consider action-research as a process of teacher training where the researcher intends to pass new knowledges and competences to teachers while taking into account the level of teachers' practical knowledge.

3 Ant, mosquito, housefly, spider, centipede, "milpés".

4 Animals belonging to the same taxonomic groups.

5 Various studies (e.g., Morais et al., 1993; Morais, Neves, et al., 2000) have shown that families at lower social levels can create primary socialising contexts similar to school contexts, depending on particular conditions, such as their access to agencies of challenge, resistance, or opposition (e.g., trade unions, political parties) or even to agencies of cultural reproduction (e.g., dominant religious institutions, sports associations).

6 The studies that we have carried out have developed ways to analyse children's positioning in family and school and to implement strategies towards its change in the

school (e.g. Morais et al., 1993; Morais, Neves, et al., 2000). We believe that, together with coding orientation, positioning is crucial for children's success. Space limitations do not allow us to elaborate in this chapter.

Transcription conventions

[…] = Text omitted
… = Pause

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