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**Abstract:** This paper is focused on the study of a specific joint action, that one could call the "teaching and learning" action. In our vocabulary, we name this action the didactic action, which refers to every action during which somebody teaches, and somebody learns.

We argue that this action is inevitably a joint action. Analyzing an actual didactic situation, where a teacher tries to teach and a student tries to learn, shows a kind of double necessity. The teacher cannot durably act without a kind of participation of the student. The student cannot durably act in the absence of the teacher. We see joint action as a necessity of the didactic action.

In this paper, we study what we call the grammatical structure of the didactic relationship. But before that, it is important to note two fundamental features of the didactic action. First, contrary to most of situations that are currently studied within the joint action paradigm (Clark, 1996; Sebanz, Bekkering, & Knoblich, 2006; Galantucci & Sebanz, 2009), the didactic action is a strongly institutionalized joint action. Contrary to the casual conversation or the current dialogue, it has an overarching goal, that of instructing students. This instruction refers to both general education, and the precise acquisition of skills related to specific pieces of knowledge. The second particular feature of the didactic action is that it is an asymmetrical action, based on a transactional object, the knowledge at stake. The asymmetry of the didactic relationship is grounded on the fact that the teacher's and the student's relations to knowledge are different.

In that perspective, we argue that trying to answer the question "Joint action: what is shared" obliges us to clarify the fundamental structure of this joint action.

In this paper, we first present a general characterization of action. Studying the joint didactic action means using a general framework about action. In the presentation of this general framework, we emphasize what we call, following Descombes (1994, 1996, 2004) and Taylor (1987, 1999, 2004), the necessary passage from shared meanings to common meanings in the inquiry process. The second section of our paper is devoted to the description of what we consider to be the fundamental structure of the didactic action. This leads us to a analysis model of the didactic game. In the third part of the paper, we focus on some empirical cases (in primary education) that we analyze to highlight the main features of the didactic joint action. A short discussion concludes the paper.

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**TEACHING AND LEARNING: JOINT ACTION IN DIDACTIC ACTION**

## Teaching and learning: joint action in didactic action

### Introduction

This paper is focused on the study of a specific joint action, that one could call the “teaching and learning” action. In our vocabulary, we term this action the *didactic* action, which refers to every action in which someone teaches, and someone learns.

As we will see, this action is inevitably a joint action. Analyzing an actual didactic situation, where a teacher tries to teach and a student tries to learn, shows a kind of double necessity. The teacher cannot durably act without a kind of participation of the student. The student cannot durably act in the absence of the teacher. We see *joint* action as a necessity of the didactic action.

In the following sections, we will study what we call the grammatical structure of the didactic relationship. But before that, it is important to note two fundamental features of the didactic action. First, contrary to most of situations that are currently studied within the joint action paradigm (Clark, 1996; Sebanz, Bekkering, & Knoblich, 2006; Galantucci & Sebanz, 2009), the didactic action is a strongly *institutionalized* joint action. Contrary to the casual conversation or the current dialogue, it has an overarching goal, that of instructing students. This instruction refers to both general education, and the precise acquisition of skills related to specific pieces of knowledge. The second particular feature of the didactic action is that it is an *asymmetrical* action, based on a transactional object, the *knowledge* at stake. The asymmetry of the didactic relationship is grounded on the fact that the teacher's and the student's relations to knowledge are different.

In that perspective, we argue that trying to answer the question “Joint action: what is shared” obliges us to clarify the fundamental structure of this joint action.

In this paper, we first present a general characterization of action. Studying the joint didactic action means using a general framework about action. In the presentation of this general framework, we emphasize what we call, following Descombes (1994, 1996, 2004) and Taylor (1987, 1999, 2004), the necessary *passage* from shared meanings to common meanings in the didactic joint action. The second section of our paper is devoted to the description of what we consider to be the fundamental structure of the didactic action. This leads us to an analysis model of the didactic game. In the third part of the paper, we focus on some empirical cases (in primary education) that we analyze to highlight the main features of the didactic joint action. A short discussion concludes the paper.

### 1. Characterizing action

#### *From a social perspective on cognition to the idea of the objective spirit*

As Galantucci and Sebanz (2009, p. 256) argue, the joint action analyses<sup>1</sup> “take a social perspective on cognition”, and it is possible to “make progress in understanding cognition by considering the immediate social context within which it occurs”.

In this paper, we follow this perspective by elaborating on the concepts of *objective spirit* and *social game*.

The concept of objective spirit stems from the Hegelian notion, as it has been reshaped by Taylor (1975) and Descombes (1994, 1996, 2004). Descombes (1994, p. 97) explains that this concept is attached to a *sociological* conception of meaning, which gives a crucial importance to the notion of *institution*: “Meaning is not locked up within the individuals’ inner realm; public and

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<sup>1</sup> In a recent special issue of *Topics in Cognitive Science*.

collective forms of existence and action are its natural elements. In a philosophy of objective spirit redefined as sociology, the study of social life takes its bearings from a study of the *spirit* of these institutions”.

One has to understand that the “spirit” of institution lies in the social life before individuals enter it. As Taylor (2004, p. 205) makes the point “Even such a simple act as a gift (which we can see as ‘economic’ in one context, and perhaps ‘religious’ or ‘social’ in another) can’t exist without some shared background normative understanding of property, of what is mine and thine”. This general feature of action is for us a general feature of *joint action*. In order to understand and describe joint actions, you have to place them in a specific frame of reference against which participants’ action gain its meaning. How is it possible to understand the action of that man with a blue jersey who gives a ball to another fellow before being tackled by a man with a red jersey, without acknowledging that he is playing a rugby game? How is it possible to properly understand this kind of *gift* without situating it in a form a life (Wittgenstein, 1997), without seeing it with the “spirit” of this institution, which is the rugby game? There is an *objective* spirit in the systems of meanings that individuals find before they engage themselves in the joint action.

### *The grammar of action as a social game*

In our inquiry, we try to hold a grammatical stance. Ascribing meaning to a given sentence means understanding it in a specific context. In the same way, assigning meaning to a “phrase” of (joint) action means identifying the context in which such a phrase has to be understood. This context can be seen as a specific form of life, that one may describe as a particular language-game (Wittgenstein, 1997). In our account of joint action in didactic settings, we use the notion of social game, aimed to enable us to perceive the logic of the specific practice at stake.

In doing that, we try to combine several perspectives. A social game embeds the definite objective spirit of a specific field of practices. This objective spirit is not a kind of intellectual entity remote from the actual practice, but a system of concrete meanings, which organize the practice, as the touchdown line organizes the rugby player’s game (Searle, 2005). Seeing human practices as a set of games, which actualizes an objective spirit, enables us to take into account the social world *regularities* (Bourdieu, 1990, 1992).

Indeed, one needs to clarify the concept of *rule* in order to use the notion of a game as a theoretical tool. In order to do so, we can use a precise distinction made by Hintikka & Sandhu (2006) who distinguishes the *definitory* rules, which specify how to play the game, from the strategic rules, which indicate how to win the game. It seems important to make clear that what Hintikka calls “strategic rules” are not “rules” in the same sense that the definitory rules are. In most cases, strategic rules are not explicit. We argue that “definitory rules” are also “constitutive rules” (Searle, 2005), as rules of the form *X counts as Y in C* that produce institutional structures.

The social game model we present thus features two types of rules. First, the definitory rules specify how to *play* the game, and, in doing that, constitute the game as an institution. Second, the strategic rules specify how to *win* the game; this supposes a *practical understanding* of the game, which Bourdieu (1990) calls “the feel for the game”. According to us, characterizing joint action thus supposes being able to identify the core of ready-made rules, the definitory rules that constitute the institutional game in itself. But this necessary condition is not sufficient. We also have to appreciate the way people master or not the strategic rules that enable them to win this institutional game. When one attends a ballet, one has to identify the choreographic design, as a set of definitory/constitutive rules which shape the dancers’ performance. But one also has to understand the “feel for the game” the dancers

enact to produce an *artistic* performance. One has to consider the ballet from a connoisseur<sup>2</sup>'s viewpoint, by appraising the very meaning of the activity.

### *Social games: background, thought style, and semiosis*

In order to understand and explain joint action, one has to identify how it unfolds against a specific background (Searle, 1989; Clark, 1996; Moyal-Sharrock, 2007). In some cases, a collective can produce a specific *thought style* (Fleck 1979), a system of categories shared in this collective, that ultimately produces "the readiness for directed perception and appropriate perception of what has been perceived" (Fleck 1979, p.99). In this way, a thought style is not only a way of sharing very conceptual assumptions (for example in a scientific paradigm, or in a specific discipline), but has really to be seen as a *perceptual* common ground (Sebanz, Bekkering, and Knoblich, 2006), which makes possible a specific semiosis process. In a Searlian language, one may say that an institutional fact is not only a manner to acknowledge that X counts for Y in C (for example that this green piece of paper counts for a dollar in a given transaction), but also a way of *perceiving* this sheet of paper as a specific sign, in a particular institutional *semiosis*. Playing a social game is thus enacting a specific *seeing-as* (Wittgenstein, 1997). Acting according to the logic of the practice is therefore to be able to participate in a specific *semiosis* process, in which language-games are perceived immediately, as *icons* (Lorenz, 1994). More generally, one may speak of the common background against which agents carry on and understand joint action as a "shared background understanding [that] can be conceived as a set of 'institutions of meaning'<sup>3</sup> (les institutions du sens) defining the meanings by which the people so linked talk and act" (Taylor, 2004, p. 205). This common background assures a kind of "objective certainty", in Wittgenstein's sense (Moyal-Sharrock, 2007), as a core of *hinge meanings* against which agents communicate. This core of hinge meanings is rooted in a semiosis specific to the social game.

### *Intentions and actions in a strategic paradigm*

A general issue about the understanding of joint action lies in the necessity of adopting a first person point of view. As Searle (2005, p. 22) puts up: "You have to be able to think yourself into the institution to understand it". We argue that adopting someone's point of view within an institution means in particular understanding her intention. We may resort here to our game-model. If you want to understand what is going on during a game, a very good way to do that consists in describing the player's intentions. In order to make such a description, most of the time, you have to use the game vocabulary. In doing that, one can persuade oneself that the intentions are not reducible to personal meanings only, but have to be identified against the game background. Moreover, you have to be a connoisseur of the game in order to understand the player's intentions. Such an *externalist* description of intentions may be founded in Baxandall' (1985), who elaborates a system of descriptions of some artists' intentions (for example, Picasso) in relation to some specific pictures (For example, the *Portrait of Kahnweiler*). For this purpose, he first elaborates a generic framework which he uses to study how an English engineer, Benjamin Baker, built a bridge over the Forth River in the east of Scotland. Baxandall (1985, pp. 41-42) states that "The intention... is not an actual, particular psychological state or even a historical set of mental events inside the heads of

<sup>2</sup> Sebanz and Knoblich (2009, p. 356), reporting neurosciences experiments, pointed out that "the amount of observation-induced activation depends on motor expertise, such that a dancer would show more activation in premotor context when seeing familiar dance movements compared to seeing unfamiliar ones".

<sup>3</sup> Taylor refers to Descombes's book, *Les institutions du sens* (1996).

Benjamin Baker or Picasso... Intention is the forward-leaning look of things... a relation between the object and its circumstances". Baxandall (1985, p. 42) continues in pointing out: "Some of the voluntary causes [of intentions]... may have been implicit in institutions to which the actor unreflectively acquiesced: others may have been dispositions acquired through a history of behavior in which reflection once but no longer has a part. Genres are often a case of the first and skills are often a case of the second... [Intentions] are matched with the relation between the object and its circumstances". So, in order to find intentions, according to Baxandall, we have to search for them in genres, and skills, in the relation between the object and its circumstances.

This is a first framework for the description of intentions we will project on the description of intentions in joint action:

1. Intentions are inherent to physical objects and environments in which these objects and actions are located. In order to understand the intention of an agent in a situation, even before questioning her or eliciting her rationale, we have to understand how the symbolic and physical surroundings within which she is acting will lead her to such or such intention.
2. The intentions have to be thought in a broader framework than that fixed by the common epistemology. We saw in particular how Baxandall seeks to extend the meaning of the word "intent" to both institutional practices (including genres) and skills. One can therefore read the intentions in the categories of perception and action that are provided by the institutions, and in skills inherent in the "handling" of particular (symbolic or material) objects in these institutions.
3. It is useful and relevant to consider these intentions at various levels of granularity (specificity). With this respect, Baxandall distinguishes the "Charge" that can "summarize" the general intention specific to a particular action, from the "Briefs" that characterize these intentions locally. The game-model seems to be relevant to take such a distinction into account. In a game (in a practice seen as a game), before playing, the players elaborate complex intentions as a strategic system adapted to the milieu characteristics. When the game is going on, these intentions are fulfilled, but they are rarely realized totally. Some intentions in the game may modify the initial plan if the milieu in which the joint action unfolds appears to be different from what it was expected to be. In this perspective, we will follow Pacherie's recent proposition (2008). Pacherie distinguishes three kinds of intentions, in refining "dual-intentions theories" one can find in Searle (1983) and Bratman (1987) notably. She distinguishes "three main stages in the process of action specification, each corresponding to a different level of intention and each level of intention having a distinctive role to play in the guidance and monitoring of the action" (Pacherie, 2008, p. 181). Pacherie acknowledges Distal Intentions, in particular "prompters of practical reasoning about means and plans" (Pacherie, 2008, p. 182); Proximal Intentions that enables moving from the abstract schema of a distal intention to a schema that meets the brief set by this distal intention but is also constrained by current perceptual information (Pacherie, 2008, p. 185); Motor Intentions that involve motor representations.

At first sight it is not so easy to blend the historical account of intentions provided by Baxandall with Pacherie's conceptualization, but it seems to us relevant to bet on their compatibility, and both possible and fruitful to keep the sociological (in Descombes' sense) orientation of Baxandall's view of *Patterns of Intentions*, and the philosophical relevance of Pacherie's clarification of the dynamics of intentions.

A way of concluding this first section could consist in seeing joint action from a meaning-making point of view. The more "general" joint action, which occurs for example in a casual short conversation between two unknown persons, unfolds against the background of shared meaning, which in some case could be seen as a *conceptual pact* (Brennan & Clark, 1996,

Brennan and Hanna, 2009). This kind of “conceptual pact” needs not be represented explicitly but emerges more or less rapidly from the ongoing interaction, for example in an agreement on the way of naming an object. In institutional settings, as in didactic action, such conceptual pacts may emerge too as shared meanings, but such shared meanings are produced against the background of what we may call, following Descombes and Taylor, *common meanings*<sup>4</sup>.

In this perspective, didactic joint action has to be considered as a specific kind of joint action, in which a background of common meanings links the teacher and the students. We will see that the didactic game consists in renewing this background by bringing new meanings that have to be institutionalized in this didactic game.

## 2. The didactic action is a joint action

As we put it in the introduction of this paper, the expression “didactic action” refers to every action in which someone teaches and someone learns. One may consider schooling settings, apprenticeship practices, familial situations, etc., and try to understand what are the deep structures of this kind of action. In this section, in order to understand the didactic joint action, we have to identify the essential grammar of the didactic relationship, the grammar of the didactic game.

### 2.1 The fundamental grammar of the didactic game

We aim to describe the didactic interactions between the teacher and the students as a game of a particular kind, a *didactic game* (Sensevy, Mercier, Schubauer-Leoni & Perrot, 2005). What are the prominent features of this game?

It involves two players, A and B.

B wins if and only if A wins, but B must not give the winning strategy to A directly.

B is the teacher (the teaching pole). A is the student (The studying pole). This description enables us to state that the didactic game is a collaborative game, a *joint game*, within a joint action. The most important way to identify the very nature of the didactic game consists of acknowledging its basic “if and only if” structure. It is to say that the didactic game is a *conditional game*, in which the teacher’s success is conditioned by the student’s success. This conditional structure logically entails a fundamental characteristic of the didactic game. In effect, in order to win the game, the teacher cannot act directly. For example, in general, she cannot ask a question to the student, and immediately answer this question. She needs a certain kind of “autonomy” from the student. If we look carefully at a didactic game, we see that B (the teacher), in order to win, has to lead A (the student) to a certain point, a particular “state of knowledge” which allows the student to play the “right moves” in the game, which can ensure the teacher the student has built the right knowledge. At the core of this process, there is a fundamental condition: in order to be sure that A (The student) has really won, B (The teacher) must remain tacit on the main knowledge at stake. He has to be *reticent*.

Brousseau (1997) coined the “Topaze Effect” to emphasize this peculiar point. In a dictation, concerning the sentence “les moutons...”, the teacher Topaze wants the students to write accurately the plural of the noun “mouton” (*sheep*), which is marked by a final “s”. So he clearly pronounces the “s” (moutonssse) at the end of the word “moutons”, and the students write down the “s”. One can argue that in this didactic game, the teacher cheated, and the students did not really win the game of writing down the plural of the noun “moutons” accurately. A fundamental rule of the didactic game has not been followed: the teacher has to be tacit, *reticent*, in order to let the student build the proper knowledge, *her* proper knowledge. The student must act *proprio motu*, the teacher’s scaffolding must not enable the

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<sup>4</sup> Here we are in agreement with Tollefsen (2006, p. 149), who shows how “groups themselves form systems that can sustain cognitive properties and processes”.



student to produce the “good behavior” (i.e. put the “s” at the end of the word “mouton”) without the adequate knowledge the student has to master (i.e. the rules of plural agreement). This *proprio motu* clause is necessarily related to the *reticence* of the teacher. We argue that in all kinds of teaching (i.e. direct instruction or inquiry oriented teaching), the teacher has to be reticent in order to be sure that the *proprio motu* clause has been respected, that the students’ behaviors are grounded on an actual knowledge, the knowledge at stake in the teaching/learning process.

Indeed the *proprio motu* clause and the teacher’s reticence compose the general pattern of didactic interactions.

## 2.2 The didactic game: the didactic contract and the milieu

In order to understand joint action in the didactic game, we have to identify the game thought style, which functions as a background for the didactic transactions. We above relied on Fleck’s contention about the thought style as “a readiness for directed perception”. A thought style enacts recognition of patterns, but while perceiving within a given thought style, “we loose the ability to see something that contradicts the form” (Fleck, 1979, p. 92).

In our framework, these thought style properties are taken into account with the notion of *didactic contract* (Brousseau, 1997), which is a system of habits between the teacher and the students. These habits entail particular expectations (either from the teacher or the students): each agent attributing some expectations to the other one(s). These *joint* habits involve both participants (the “teaching pole” and the “learning pole”) in the didactic relationship. A good example of the cognitive strength of the didactic contract can be founded in the research paradigm called “the captain’s age” (Schubauer-Leoni & Perret-Clermont, 1997). Researchers submitted “absurd problems” to students at primary education (a boat has got 3 veils and 42 crew members, how old is the captain? A shepherd has got 125 sheep and 5 dogs, how old is the shepherd?). Surprisingly (at least for the researchers), a great proportion (from 80 to 95 %) of the students gave an answer (by using the given numbers of the problem), only a very small part of them replied that it was impossible to answer. This example makes us understand what is a didactic contract. Every time they had to solve a problem (before encountering “the captain’s age problem”), students had to implement the same set of procedures. First, they had to give an answer. Second, in order to “produce” this answer, they had to use the numbers provided in this problem. Third, these numbers had to be “associated” thanks to the last “means of calculation” (addition, or subtraction, etc.) they had learned. These habits function as rules (in order to respond the problem), and as norms (of what one must do when dealing with a problem). Above all, they stand fast as a system of expectations, and of attribution of expectations. One can simulate the students’ reasoning in a first person point of view by saying: “if the teacher gives me this problem, he is expecting me to behave in the same manner as I always behave when I solved problems, so I have to give a solution, by using the same methods I used before”. It is important to note that the didactic contract, as a system of expectations, is totally implicit. As we argued, it functions as a common background fostered in everyday joint action, a thought style attached to the “problem solving” game. In the didactic transactions, the didactic contract appears clearly only when it is broken.

In a didactic institution, such an institutional contract has to be modified all along the learning-teaching process. It is the true nature of a didactic institution to evolve when a new knowledge has to be taught. New habits, new *joint habits*, and new common background, have to be created.

We can theorize this change by introducing the notion of antagonist *milieu* (Brousseau, 1997). The didactic contract can be seen as a way of assimilating, in the piagetian sense, the didactic experience. In our previous example (the Captain’s age), the contract, as background

knowledge, “enables” the students to answer the problem. When some new elements, that the joint action cannot directly assimilate, are brought into the milieu, the didactic contract has to be changed. The teacher and the students no longer move around in a common well known, taken for granted conceptual space. They have to “adapt” to this “antagonist” milieu, which the teacher and students’ joint habits cannot directly deal with. This type of milieu brings a kind of *resistance* to the joint action. Indeed, the new situation at stake, in the “absurd problems”, needs an accommodation from the cognitive system. Learning relies on such accommodation.

## 2.2 Intentions in the didactic game

### 2.2.1 The structural complexity of the intentional structure in the didactic game

We see the didactic game as a specific asymmetrical knowledge game. In order to respect the *proprio motu* clause (i.e. enabling students to build a first-hand relation to knowledge), the teacher has to be *reticent* (not to give knowledge directly). The didactic game rests on a contract-milieu equilibrium, in which the common background has to be renewed when an antagonist milieu, in new didactic situations, prevents using current knowledge habits.

In this perspective, the question of intentions in the didactic game is a fundamental one.

First of all, one has to recognize two structural layers in the didactic game. The first layer refers to the specific logic of the didactic game. As we saw, in this game, the teacher wins the game so far as the student wins - on her own, that is to say that she achieves the capacity the teacher is expecting from her. The teacher thus holds a general intentional stance, which consists in enabling the student to succeed. This intention is acknowledged as such by the student, her involvement in the joint action depending on her trusting the teacher on this point. But this teacher’s intention must not overrun the didactic space. The Topaze effect, as we saw, occurs when the teacher’s intention relative to the student’s success prevents the students to reason and to learn. The student succeeds in putting the “s” as a plural mark, but she does not know why, and she does not learn. This is the second layer of the didactic game. The general intentional stance consists in enabling the student to succeed, but the specific intentional stance consists in hiding the precise didactic intention, so as not to alter both the knowledge at stake, and the student’s relationship to this knowledge.

### 2.2.2 The teacher’s intentions in the didactic game

The general analytical frame we outlined above may be useful to understand the concrete unfolding of intentions in the didactic game. In preparing the learning session, the teacher elaborates a system of distal intentions (Pacherie, 2008). One can say that she builds the joint game that she intends to play along with the students. In doing this preparation, in “building the game”, the teacher may design a system of distal intentions, which is also, as we will see, a system of strategic rules. The specificity of this rational planning refers notably to the fact that the preparation design involves joint action, in that the teacher has to simulate students’ responses to the didactic devices she intends to implement.

Another interesting feature of the unfolding of the didactic intentions lies in their dynamics. In effect, even though the teacher has built the game in designing a system of strategic rules, the very complex online joint action necessarily brings modifications to the planned structure. So the proximal intentions stem not only from the distal intentions previously shaped, but also from the very joint action itself.

## 2.3 (Mis)alignment in the didactic game: crisis or reference

The very nature of the didactic game entails a peculiar structure of alignment and misalignment. So to speak, the “early moments of processing” that researchers have put into

focus in weakly institutionalized everyday (or experimental) interactions cannot have the same nature in the didactic game. In the latter, the transactions appear against a set of ready-made rules (the regularities of the didactic contract), which enable, in most cases, a (relative) reciprocal understanding between the teacher and the students. For this reason, in didactic settings, it is useful to search for situation of (more or less) “radical misalignment” (Pickering and Garrod, 2004, p. 179). The “captain's age” situation, that we previously outlined, is such a situation. The common background does not function, and the misalignment is radical, in that the new didactic milieu (the “absurd problem”) cannot be assimilated. Such a misalignment is a crisis of reference that makes impossible (for the teacher or for the students) to draw on joint inferences that characterize a “plain” didactic transaction. It is worth to note, here, that the “radical misalignment” situations are often grounded in semiosis problems, as we will see in the next section.

### 3. Joint didactic action: an empirical study

We believe that understanding joint action relies on the use of various complementary methodologies. In particular, it is obvious that experimental methodology has played and will play a fundamental role in this collective inquiry. In the following empirical studies, however, we use a clinical method, grounded on Foucault (1994) and Ginzburg (1987) conception of clinic.

All these cases are situated at primary level. The first three cases refer to “ordinary” lessons. The last case stems from a design research experiment.

#### 3.1 Reading at First Grade: Sol's case

The episode occurs in a First Grade Class (6-year-old students), in March, during a read-aloud collective activity.

The teacher has the students read aloud, one after the other. It is Sol's turn. She has to read the following sentence: “The ravens gathered and flew” (*Les corbeaux se rassemblèrent et s'envolèrent*).

In this very short excerpt, the focus is on the word “rassemblèrent” (gathered).

241	Sol	The raven + have ( <b>pause 15s</b> ) [ <i>some students raise their hands</i> ] Les corbeaux + ont
242	T1	So + try alors + essaie
243	Sol	Try Essaie
244	T1	No no No (laughs) Try to read the word + go ahead come on + take up since the beginning + look you have a « r » and a « a », it makes « ra » Non non non (rire) essaie de lire le mot + vas-y lance toi + reprend depuis le début + regarde t'as un re et un a + ça fait ra ::
245	Sol	<u>Ra</u>

In 242, the teacher (T1) heartens Sol, who cannot read the word “rassemblèrent” (gathered). Sol takes this support literally (242: *So, try*) and misinterprets this support as the giving of the “good word” she has to read (243: *Try*). After that, Sol is supplied by the teacher who prompts her to “read the word” (244) and helps her to produce the good technique of word segmentation (phonological decoding).

These few speech turns reveal some fundamental phenomena in didactic joint action. Sol's task consists in reading the word “rassemblèrent” (gathered). This task draws the milieu of her action. It is important to note that she has to recognize an *intentional* pattern, which P1 expressed in 242 (*so+try*), and a *non-intentional* pattern (the word “rassemblèrent”(gathered) she has to read aloud). We think her error came up because she has given priority to the intentional pattern, in the didactic contract (the supportive teacher's action she believes to be

the giving of a word), while the non-intentional graphic form (the word “rassemblèrent” (gathered)) was difficult to decipher.

This error can be seen as a kind of misalignment. It can be understood very well, mainly for the following reasons: the word giving is a *joint habit* in the didactic contact of this class. Thus Sol has good reasons to interpret the teacher's supportive action as a word giving, by perceiving directly the teacher's help against the background of this habit. In terms of learning games, we would say that Sol mixed up two different processes (the capacity of recognizing the intentional teacher's help; the capacity of deciphering the word) in the same learning game, that we could call a *decoding* game. We can describe easily the main definitory rules of this learning game: the student that the teacher has assigned “reads” the words by trying to decipher, and she knows she can rely on the teacher's help, if the word is too difficult to decode, thanks to the word-giving technique (or syllable-giving). The word-giving technique is part of the common meanings that the students and the teacher share, in the didactic contact of the class. In this excerpt, the “antagonist” milieu (here, the word “rassemblèrent”) brings *resistance* to the “natural action” embedded in the joint habits. The student has to recognize, in the words of the teacher, the “good” intentional pattern (not a word-giving technique, but simply an encouragement), and to work out adequately the resistance of the milieu. Sol's funny mistake reveals the structure of the common background against which the transactions are in progress.

From the teacher's viewpoint, this episode may illustrate the didactic *reticence*, in that the reading aloud exercise rests on the fact that the teacher must not give the student the word “rassemblèrent” (gathered) directly, in order to let her produce a first-hand relationship to the piece of knowledge at stake. It's only when it becomes obvious, by considering Sol's mistake, that she alone will not be able to read aloud the given word, that the teacher helps her to decipher, syllable after syllable.

### 3.2 Geology at Fifth Grade: Paul's case

In this excerpt (Santini, 2007), students work in groups on isoseismic lines<sup>5</sup> maps and the teacher T2 presents a simulation to evaluate a students' hypothesis (the earthquake loses power while moving on) that may explain these maps, with 14 cards standing two by two (fig. 1).

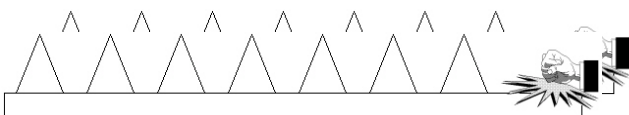


Figure 1: Simulation of earthquake damages on buildings

814. T<sub>2</sub> It (*the earthquake*) loses power while moving on well we will see so I'm going to simulate an earthquake a small one hush a small one first just to see here. T<sub>2</sub> hits the table. All cards remain standing up.
815. Stud<sup>6</sup>. A It doesn't work
816. T<sub>2</sub> Nothing happens
817. Paul Not felt by humans + not felt by humans
818. T<sub>2</sub> Oh good what have you said?
819. Paul It's first degree on C.M.S.
820. T<sub>2</sub> On M.S.K. scale he said not felt by humans it may be the first degree
821. Paul Only by seismographs
822. T<sub>2</sub> No one notices it only seismographs maybe
823. Stud. A Well that's normal

In the same way as the previous episode, this episode can throw light on some fundamental didactic phenomena in didactic joint action. The learning game, here, does not refer to the

<sup>5</sup> Lines exhibiting equal intensity of earthquake shock.

<sup>6</sup> Stud. Stands for “Student”.

production of a technique (decoding), as previously seen, but consists in the familiarization with a modeling process. First, the students have to see the cards as a “model” for the buildings and the teacher’s hit as a “model” for the seism. But this first semiosis cannot be sufficient. The teaching-learning process needs a second one, grounded on the recognition of a second modeling process, about the perception of a seism: in the same manner as the teacher’s hit can occur without moving the cards down, an actual seism can occur without being perceived by the humans. In such a case it will be the seismograph sensibility that will allow the geologist to identify the seism.

In order to play the game accurately, students need to assimilate the new milieu. The current didactic contract is an “experimental sciences” contract, in which the students are notably used to making hypotheses, and to imagine and/or use simple “models” of physical or biological phenomena. Against the common background of these habits (and others), the students have to assimilate the new milieu, which modelizes the seism.

A closer look at the transactions shows how the teacher manages the learning game.

The student Paul leads the activity. He understands directly the second part of the learning game (i.e. the second semiosis) that allows him to introduce (with a designation error) the M.S.K scale (817) and the seismograph (821). Paul is straightaway in the appropriate modeling game: he directly perceives the signs and their reference as expected by the teacher. He is in a high transactional position, in that he is the one who moves the knowledge forward, as we can see by considering the entire set of his speech turns, which enables to appreciate the “knowledge story” in the class.

Is it to say that the teacher is inert, only in the observation of students’ activity? Absolutely not! Paul’s interventions depend strongly on the teacher’s management, which make them possible. After Paul’s first utterance, the teacher legitimates this declaration (818) and asks him to repeat what he has said. This legitimization is determinative for the following process. One can see both the selection function of the teacher’s role in the didactic transactions, and the trilogic aspect of his declaration, since the repetition allows the dissemination between the students of a good relation to the modeling process. More generally, T2 marks his teacher’s position by modalizations (the conditional mode (may be); the adverb “maybe”), which diminish the directness, and even the possible dogmatism of Paul’s argumentation. The entire set of transactions may be analyzed in the same way.

Such an episode shows us a student perfectly adequate to the teacher’s project. The teacher acknowledges in Paul’s behavior the “scientific” thought style he is trying to teach, both as a way of reasoning and a way of perceiving analogically. The teacher accompanies this student and they both move the knowledge forward, the student by bringing on the didactic stage new pieces of knowledge, the teacher by legitimating this action, and by disseminating the very meaning of student’s utterances in the class. If Paul holds a high position in the didactic transaction, it is thanks to the approval of the teacher.

This example highlights the fundamentally “joint nature” of didactic transactions. Without the student’s declarations, the teacher would not put forward the didactic game; without the teacher’s interventions, the student would not reach the high position he holds in this episode. On the contrary, the next studied episode shows a great discrepancy between the teacher and one student.

### 3.3 *Mathematics at fifth grade: Luria’s case*

The class (Fifth grade) is working on a problem in which a geographic map has to be “enlarged” (Ligozat & Leutenegger, 2008).

We pass from a map A to a map B “enlarged”.

A distance of 3 cm on the map A is 4 cm on the map B “enlarged”.

How, on map A, is a distance which measures 1, 5 cm on map B?

Here is the production of a student (Luria who is working in dyad with Christine)

$$\begin{array}{l|l} 1,5 : 3 = 0,5 & 3 : 3 = 1 \\ 1,5 + 0,5 = 2 & 3 + 1 = 4 \end{array}$$

*Reception of the teacher:*

1. T3: so Luria// could you explain again as you said to Christine?
2. Luria: so yes// a little bit// it is// I thought it was the third// the third larger// the third more↑
3. T3: why the third?

.....

15. T3 (*Look at Luria dubiously*) It's right it's two centimeters//but I must admit I have some trouble in understanding your reasoning

*After he has produced his procedure, Luria said to his partner:*

Luria: (xxx) zero point five...// she's going to tell us/ but why do you do that (fake voice to imitate T3)

When she gave this problem, the teacher had in mind a specific method of resolution: the cross-products method. Thus, the procedure she was expecting for consists in integrating "the figures of the problem" in a table as following:

Distance on the map A	3 cm	1,5 cm
Distance on the map B	4 cm	???

before performing the cross-product ( $(4 \times 1,5 / 3 = 2)$ ) to find the right answer, which is 2.

We can see this procedure as a set of distal intentions. The teacher has been given the "scale problem" by the researchers, she has studied it in her preparation, and her strategic system could be paraphrased by an utterance of this kind "Bring the students to use first the proportion table, then the cross product!"

We can see that Luria has found another way. Luria used a method that one could qualify both additive and analogical. The analogy is expressed by the semiotic disposition of his computing. One can say, in effect, that he has followed a "path", from 1,5 (the number he had to find the image of), identical as the one he perceived to go from 3 to 4. We could paraphrase his solving method in this way: first take the third of the number, and then add this third to the number ( $((1,5/3) + 1,5 = 2)$ ). As we can see, Luria is not "in the didactic contract" (those of cross-products), and if it is so, this is paradoxically because he has explored the milieu, by working with the problem numbers in a rather inventive way, rooted in the mathematical signs.

When T3 encounters Luria's production, she asks him first to explain it. Luria cannot do that easily, but in a certain way, his explanation is right (*the third larger*). But Luria cannot justify this "third". He is not really self-conscious of the technique he has used, maybe partly performed by chance.

The teacher herself is in a certain state of uncertainty. After she acknowledges the rightness of Luria's result, she admits her perplexity (15: *but I must admit I have some trouble in understanding your reasoning*). This perplexity is a clue for our analysis: the transaction is ruled against different backgrounds. For Luria, a "serendipitous" method, additive and analogical, grounded on the work of signs; for T3, the cross-products that one may see as a

specific thought style, which prevents her from i) recognizing other ways of modeling the problem; ii) understanding the mathematical activity as grounded on the works of semiotic forms. One can also remark a joint habit in the didactic contract of the class: the students must be able to explain and justify what they have done. We can trace this habit in the proper transaction, on the one hand (1: could you *explain again as you said to Christiane?*), and after this transaction, when Luria formulate in a parodic way, by imitating P3, this norm of the didactical contract (*she's going to tell us/ but why do you do that (fake voice to imitate T3)*), a norm which has confused him, since he has not been able to justify his calculation ("add the third").

If we compare this situation to the previous one, we can see very similar things as well as very different ones. In both cases, the student (Paul or Luria) is committed in a relevant way of doing, but only one of them (Paul's one) is adequate to the teacher's project. The teacher T2 recognizes his didactic goals in the student's declarations, and, thanks to relevant moves in the learning game, gives the student a prominent place in the transactions. There is a common knowledge at work, a common thought style that the teacher hopes to disseminate in the classroom. In the other case (Luria), on the contrary, the teacher T3 cannot understand the student's action, since it is very far from Luria's knowledge background. There is no common knowledge, no shared milieu, and no common thought style here. Luria does not recognize the teacher's expectation about the cross-products; the teacher does not recognize Luria's semiotic/analogical work on the problem at stake.

### 3.4 Mathematics at Fifth Grade: the puzzle's case

We focus now on a different case. Contrary to the previous studies, this episode occurs in a design experiment. It refers to the puzzle situation (Brousseau, 1997) within a very large "didactic engineering" (N & G. Brousseau, 1987), which is a first situation for the study of linear mappings. It consists in enlarging puzzles, so that the segment that measures 4 cm on the model will measure 7 cm on the reproduction.

After a brief planning phase in each group, the students separate in order to make up the pieces.

In the studied episode, as usual in this case, the students of a group have added 3 cm to every dimension.

It's a mistake, but a quite understandable mistake, as we will see.

The result, obviously, is that the pieces are not compatible. The teacher comes to a group at this moment. We give the transcription of the dialogue between the teacher and the students.

1.	Student	There's a problem it looks as if one is missing
2.	Teacher	There's a problem yes
3.	Student	But already here it's leaning a lot here and then it's there
4.	Teacher	Yes and it should be leaning in the same way?
5.	Student	Here we can see that the pike it touches the other one here again there is a problem and here it should be there it does like this there it does like this it would have been correct
6.	Teacher	And everywhere here you have added 3 are you sure you've added 3
7.	Student	yes
8.	Teacher	1,2,3, 1,2,3, 1,2,3
9.	Student	Well not to this one
10.	Teacher	1,2,3, have you added 3 everywhere?
11.	Student	Well it is correct
12.	Teacher	Then what must be challenged?
13.	Student	Well It's wrong well this piece is a good one
14.	Teacher	Well no it's not because it doesn't make up the good puzzle
15.	Student	Here it doesn't make 3
16.	Teacher	Where 3?
17.	Student	It only makes 2

18.	Teacher	Well 3? It's 3 more where?
19.	Student	On each side
20.	Teacher	If I were you I'd think about the method I used maybe this is what's not good
21.	Students	Yes
22.	Teacher	Maybe it's you're sure you've added 3 you didn't make any mistakes when you cut out the pieces ok? Everyone has cut on the lines?
23.	Students	Yes
24.	Teacher	Well so maybe you mustn't add 3 you must do something else
25.	Tony	But from 4 to find 7?
26.	Teacher	Ah
27.	Student	There's a problem here too
28.	Teacher	Are you listening Tony
29.	Students	Yes
30.	Teacher	Go on try to look into this problem

### The puzzle episode: a first description

In 1, the student acknowledges that “there is a problem”. We can analyze the excerpt by structuring it into four parts: in the first part, from 1 to 11, the teacher want the children to agree that if there is a mistake, it is not a measurement mistake; 12 (*Then what must be challenged?*) is the teacher's first try to give the students an incentive to challenge their method, but without effect; in the second part, from 13 to 19, the teacher and the students return to the discussion of the measurement method, notably by arguing about what is a “good piece” (13-14); in the third part, from 20 to 26, the teacher takes a high transactional position, in order to focus the students' attention on the “proper signs” of the situation; in the forth (last) part, one can think that the students are beginning to challenge their method (25-27), so the teacher leaves the students and goes to another group.

### Some teacher's moves in the Joint Action

We can focus on several teacher's moves in this excerpt. 1) In 4, the teacher holds an “accompanying position”, at the same level as the students, but the students do not really understand the question. 2) In 12, the teacher's move is produced in order to make the students understand that they have to change their way of conceiving the problem. It is worth noticing that this calls for a different position from the teacher: not an “accompanying position”, but an “analysis position”, in which the teacher does not use the same kind of *reticence* about her knowledge. But this move does not work, for the students go on discussing about their measurement. 3) In 20, the teacher takes a higher position, in a very interesting utterance: “*If I were you*” functions as a prominent sign in the didactic contract. For the students, the use of the first person pronoun may mean that the teacher is saying an important thing, and by using the word “*method*” the teacher draws the students' attention to the fundamental meaning in this episode; 4) In 22, the teacher makes a summary of the students' work that functions as a kind of frame for an inference, which could be: if you are sure that your measurement was right, then you have to challenge the *mathematical* method. 5) In 24, the teacher draws herself the inference (if it is not a measurement error, then it is a *method* error). Tony's reaction in 25 (*But from 4 to find 7?*) is very informative of his endorsing of the additive strategy, and one may see that as an encounter of ignorance. For the first time in the episode, the additive strategy is questioned, which may function as a sign for the teacher that the learning process is going on.

### The puzzle episode: a redescription

The fundamental goal of this situation is to provide an antagonist milieu, which the current didactical contract cannot assimilate. But, as we will see, the fact the current didactical contract is invalidated has to be built as a piece of evidence. In that perspective, first of all,



the students have to *encounter their ignorance*, with the resistance of the milieu. We mean that they have to acknowledge that their current mathematical knowledge (grounded on the addition), which they used in this situation, does not enable them to do the right enlargement. In this learning game, as we have seen, they have to make a clear distinction between what is a *measurement error* and what is a *method (mathematical) error*. In order to move the knowledge time forward, the teacher has to be sure that the students are convinced they have not made a measurement error. It is a necessary condition for them to challenge their method (i.e. the additive method).

The transactional characterization of this learning game enables us to understand how the teacher is progressively taken more and more responsibility in the didactic transactions. From a low transactional position at the beginning of the episode, he reaches a rather high transactional position at the end of the episode. Thus we can acknowledge the specific interplay between time and position in this rather short episode. The high transactional position is possible only because the knowledge time has gone by, as we can see in the comparison of 2, 12, and 24. The teacher's "feel for the game" enables her to accomplish gradually this transactional rising while keeping an effective didactic reticence.

#### The contract-milieu dialectic

At the beginning of the episode, the students are caught in the didactic contract enacted by the situation. The question Tony asks at the end of this episode (ST 25, *but from 4 to find 7*) is very symptomatic of this contract. In this situation, to solve this enlargement problem, one *has to make* an addition. The present learning game is supposed to stem from the students' observation that the puzzle pieces do not fit together. This observation has to be seen as a resistance of the milieu, a relevant feedback for the modification of the students' strategy. But this resistance is not obvious for the students, and the teacher's work consists in helping the students "read" the milieu. For the researcher (and for the teacher as well) a fundamental aspect of this episode consists in acknowledging how the contract/milieu dialectic needs to be built in the joint action. The students do not "naturally" perceive the milieu feedback. In the uncertain didactic transactions, what counts as an evidence for the teacher (the pieces do not fit together), which provides an accurate inference (the additive strategy does not work) is very far from the students' relationship to the milieu, given that this relationship is shaped by the "additive contract". It is worth noticing that the students, in experiencing these obstacles, are not very far from situations that history of sciences teaches us. When a researcher thinks in a certain thought style (as the additive contract for the students in this episode) some things are just unthinkable, even thought they would have to be inferred from the experimental results. In this situation, the students have to build another relationship to the milieu, to the "experimental facts" (the pieces do not fit together), and to the mathematical and physical necessity, and *they can't do that alone*.

The teacher's monitoring, in the joint didactic action, is fundamental to foster the students' relevant relationship to the milieu and its events, which will enable them to "resist" to the didactic contract joint habits and to renew them. In that, for the teacher, enacting the contract-milieu dialectic in the didactic transactions is a way of taming the uncertainty while building a relevant certainty, and enabling the students to accurately recognize the "empirical facts".

## 4. Synthesis and discussion

### 4.1 Intentions in Joint action

#### The shaping of intentions in joint action

Most of the time, the distal intentions cannot integrate the actual action, and, in particular, the actual joint action. In our empirical studies, one can for instance acknowledge dramatic differences between Paul's Case (Earthquake in Geology) and Luria's Case (Cross-product in Mathematics) from the teacher's intentions viewpoint. One can describe the two teachers' intentional systems in the same way, namely as related to a specific thought style (the "modeling" of earthquake, the cross-products procedure in the proportion table) which in part determines the future action. But in the first case (Earthquake), the teacher has to monitor the behavior of a "didactic collaborator" (Paul) who is in full knowledge of what is at stake, in order to disseminate Paul's thinking among the students, while in the second case (Cross-product), the teacher is confronted not only with Luria's lack of understanding of his way of dealing with the mathematical problem, but also with his own lack of understanding of Luria's technique. In each case, the distal intentions set up a general strategic system, but the proximal intentions may take very different orientations according to the students' transactional reactions. It's not surprising that the distal intentions and the proximal intentions are different, given that they are "ontologically" different. But in our cases, one can see such a specification of the relationship between distal and proximal intentions by the joint action as a consequence of the logical structure of didactic action. The moving from an abstract "distal intentions schema" to a concrete "proximal intentions schema" is both the condition and the effect of the transactional shaping of the "newly" shared background between the teacher and the students. As we saw in Luria's case as well as in the puzzle situation, this transformation depends both of "perceptive" and "epistemic" factors, which allow the teacher and the students to share the same seeing-as.

#### Shared intentions

In that way is it possible to think of shared intentions? Our answer will be specific. In the didactic game, in order to win the game, the sharing of intentions must have a distinctive nature. Like in all sorts of game, shared intentions must respect the logic of the game. As we saw, the didactic game is a *conditional* game (B (the teacher) wins if and only if A (the student) wins). Thus the sharing of intentions must respect this logical structure. We argued below that one can consider two fundamental kinds of teacher's intentions. A first layer refers to a general intentional stance, which consists of enabling the teacher to success. A second layer bears on the necessity of teacher's *reticence*. In a certain way, one could say that the teacher's intention to teach has to become the student's intention to learn. Consider for example the puzzle's case studied above. The intention to teach, for the teacher, primarily lies in the fact that the students have to encounter their ignorance, i.e. to become able to recognize that the pieces of the puzzle do not fit together even though their measurement is right. The intention to learn, for the students, consists in producing an enduring work in an uncertain condition, while relying on the teacher's help, but in taking into account the fact that knowledge does not lie in the deciphering of teacher's epistemic intentions. What does the sharing of intentions mean in this case? It is given by a kind of trust in the joint action. The teacher trusts the students, in that he knows that they are ready to commit themselves in the pursuit of knowledge. The students trust the teacher in that they know that the situation is "playable", that the didactic game will enable them to learn. If the teacher and the students are

committed together in the joint action, the very fact of this joint commitment appeals for a specific kind of trust<sup>7</sup>.

In a more general perspective, one may argue that the joint action relies necessarily on a certain fitting of intentions, on a certain adjustment of strategies<sup>8</sup>. Intentions, and the strategies that they embed, have to fit; that means they have to respect the very nature of the game in which the action unfolds. In joint games, one could conjecture that the fitting of intentions and strategies relies on a certain comprehension of the nature and the structure of the partner's intention and strategies, even in the asymmetrical games as the didactic games. But our fundamental point is that this reciprocal intentional comprehension is not just an "individual" understanding of what's going on in the game, from the other's point of view. It refers to the "objective spirit" embedded in the game. It is a fundamental part of the "feel for the game" which makes the good player. But the "feel for the game", if it refers to the way a given individual make her own world in a given game, necessarily reflects the essence of the game at play.

#### 4.2 *Common background, thought style, and semiosis process*

Following Fleck (1979), we have argued that a thought style both allows recognizing what is meaningful in the conceptual and perceptual framework it enacts, while it prevents to recognize what is meaningless under its perspective (Sensevy, Tiberghien, Santini, Laubé, & Griggs, 2008). According to us, the empirical studies we have presented in this paper give pieces of evidence for such a view. As we showed in this section, Luria's case and Paul's case may be interpreted as a dramatic lack of common background between Luria and the teacher, and as an unexpected presence of a full common background between Paul and the teacher. In the same way, Sol's case (Reading at Grade 1) show that the common background lies in the "decoding game" we have identified, and which makes the transaction possible, while Sol's error (repeating the teacher's word of encouragement, she takes to the word to read) demonstrates that a "false" background may be easily instantiated in the didactic game. As we have tried to show in our analysis, the puzzle's case is a dramatically uncertain situation, in that the common background has vanished, even the most obvious material signs (the pieces of the puzzle do not fit together) failing to be accurately recognized in the didactic transactions. In each case, the common background necessary to the reciprocal understanding rests on a thought style which is common in some cases, which has to be commonly built in some others.

At the beginning of this section, we have described the common background in two layers: an "ancient" common background which allows the communication; a "newly" shared background, which has to be shaped within the ongoing transaction. In our theoretical frame, the "ancient" background is the *didactic contract*, that system of joint habits and joint expectations which functions both as a system of rules and a system of norms. The newly shared background is shaped in the actual milieu of the transactions. It seems to us that this kind of distinction may make us understand why the didactic joint action might be seen as a kind of "ultimate" cooperative game against which each cooperative game could be thought.

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<sup>7</sup> Analyzing a situation in which an adult and some children are involved in the same activity of finding stickers, Butterfil (2007, p. 5) shows that "the child already knows what the adult is doing because she knows what she herself is doing, and she knows that the adult is doing this with her". We would like to generalize such a reflection. Even thought, in the ordinary didactic action, the student and the teacher do not share the same background, they know they are playing the same joint game, and they both know how this game has to be played.

<sup>8</sup> As Tollefsen (2005) analyzes it, Bratman (1993) poses the necessity of subplans meshing in the "cooperative neutral" joint action. Our "adjustment of strategies" is a kind of generalization of this idea, from the "objective spirit" point of view. This is this "objective spirit" of the game that allows the players, to borrow Tollefsen's analysis (Tollefsen, 2005, p. 93) to "perceive jointly" the common intentions and the subplans meshing.

We may pose that every joint action can be seen as unfolding against two types of backgrounds. A *common background*, a core of hinge meanings which makes the communication possible, and which can be seen as a system of fundamental reciprocal expectations attached to the social game at stake. A progressively *shared background*, an *in progress background*, which is built with the transactions. According to us, this conception bears two consequences.

First, there is a pragmatic efficiency of the background. One may be struck by the fact that the examples often given in the literature about the notion of background are so often very strange (when someone shows us a chair in her office, we do not climb the chair...) as if their philosophical use was first to struggle the skeptic stance. But the background is not only the locus of an objective certainty, it is first and above all the main basis of everyday meaning-making process.

Second, such a conception of the background as a thought style may help considering the issue of lower-level processes *versus* higher-level processes. As Sebanz and Knoblich (2009, p. 365) argue, it is an important question to understand “how lower-level processes like action simulation and higher-level processes like verbal communication and mental state attribution work in concert”. If one approaches such a problem with the notion of (layered) background as a thought style, one can likely rely on the essence of what is a thought style to understand how the grasping of affordances is both a perceptual and a conceptual process. To be able to see the puzzle pieces as pieces that do not fit together, is it a lower-level process, or a higher-level process? We argue that this distinction, here, might be counterproductive. Achieving this capacity, as well as, we conjecture, achieving all connoisseurs’ capacities, might be to be able to see the concept in the particular, and the particular in the concept.

#### 4.3 *The grammatical stance*

As we saw, this paper is grounded in a simple idea, that is, in order to understand the agents’ action, one needs to know the game at play, what game the agents are playing. It’s what we have called the *grammatical stance*. Finding important differences in data analysis (concerning the “target advantage”) between Kronmüller and Barr (2007) and Metzing & Brennan (2003), Brennan & Hanna argue that “This striking difference in time course between the two experimental situations... suggests that they may have represented quite different language games for their participants” (Brennan & Hanna, 2009, p. 84). We aim at generalizing this kind of reflection, which, it seems to us, expresses very well this grammatical stance we would like to hold. Seeing a situation as a language-game, whether it be experimental or not, enables the researcher to understand the logic of practice, and, in doing that, to elucidate the agency of individuals acting in this situation, playing this game. In this perspective, understanding joint action means in a first movement necessarily identifying the grammar of the situation, the kind of game in which action unfolds.

We argue that in order to understand joint action in didactic settings (like in any other milieu), the most important is *not* to build some general understanding of what is joint action in itself. It is certainly crucial identifying biological, anthropological, developmental, etc. conditions and constraints, which explain the ontological necessity of joint action, and which determine some fundamental aspects of its nature and structure. But the most important, from us, is to be able to describe particular institutional practices as they actually occur in the social space, from a conceptual viewpoint. The grammatical stance, which consists in recognizing the very logic of a given practice in the social world, and the “objective spirit” or human institutions, enables us to envision such conceptual description of everyday practices.

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