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A socio-cognitive perspective on learning and cognitive development

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Contents

Learning outcomes

After you have studied this chapter you should be able to:

1 describe Piaget's views on the significance of authority, peer collaboration and individual activity for cognitive development;
2 describe Vygotsky's position on the role of social interactions in cognitive development;
3 describe Mead's theory of symbolic interactionism;
4 explain how these theorists' socio-historical contexts may have influenced their thinking;
5 define the concept of 'socio-cognitive conflict' and describe its role in fostering cognitive growth;
6 explain why intersubjectivity is significant in understanding teaching;
7 define 'didactic contract' and explain its significance;
8 discuss how Doise's four levels of analysis offer ways into the study of learning and development.

1 Introduction

In this chapter, we start by reviewing three theoretical positions on cognitive development that have been prominent in research on learning and have had major influences on educational practice. We then explore the importance of recognizing the ways in which children's learning is embedded in and formed by social relationships and practices, and the implications that these have for theory. This leads to a new way of thinking about the processes that are active when learning takes place. It also gives a broader perspective on the factors that may need to be considered when seeking to improve the effectiveness of learning situations, when trying to understand how, why and when children learn.

The ideas covered in this final chapter also offer a new set of perspectives from which to view the ideas and findings presented earlier in the book. In particular, this chapter broadens the frame within which cognitive development can be viewed. It suggests, in a number of ways, that development does not just 'happen' within the individual child, but that it occurs in a context of social customs, understandings and relationships that play an important role in either facilitating or hindering the individual's progress towards more advanced modes of thinking. Further, we argue that this context is an integral part of learning, which defines the meanings that children and teachers give to their joint activities. Learning is embedded in particular social practices, with specific expectations and values, especially, but not only, in school situations.

Our aim in this chapter is to offer a critical analysis of the basic assumptions and orientations of three main theories in developmental psychology, those of Jean Piaget, Lev Vygotsky and George Herbert Mead. We locate their ideas within the

dominant cultural ideologies of Europe, Soviet Russia and the United States and consider some of their implications for the ways in which education and learning are conceived and structured. We then bring in new ways of thinking about learning and teaching situations, illustrated and supported with research evidence, to build a richer understanding of the social and psychological processes involved. A particular focus throughout the chapter is on the mutual understandings that participants in such situations hold about the nature of the social relationships supporting teaching and learning interactions; what we describe as the 'didactic contract'.

2 Three theoretical positions

2.1 Jean Piaget and constructivism

Jean Piaget (1896–1980) always firmly believed that learning and development proceed from *within* the child; that the child constructs their own knowledge as an individual, independent activity. According to Piaget, the transmission of knowledge from one generation to the next was not of prime importance for the child's cognitive development. He was convinced that children are the authors of their own thinking, and his theory was based on this perspective; it lies at the heart of the Piagetian conceptual framework. He promoted this point at a time when it was not an accepted notion, except within the developing movements for 'progressive' education in Europe. Although, as you will see, this position generates many problems, Piaget's firm beliefs represented a major step forward in the mid-twentieth century; a time when behaviourism was a dominant model for psychological development.

According to the behaviourist perspective, children are basically passive learners. Children's learning is seen to arise from the rewards and contingencies provided by the environment around them, and development is simply a gradual accumulation of these acquired habits and associations. These ideas originated primarily in the United States at the beginning of the twentieth century and were consonant with the country's dominant ideology at that time. It can be seen, for example, how the underlying behaviourist images of the child as a 'blank slate' with unrestricted potential are linked to the socio-historical context of the United States. At the time when Piaget's views came into prominence in relation to educational policies and practice, behaviourism was being extensively used as a theoretical rationale for the promotion of somewhat traditional, teacher-led forms of teaching. It was also a basis for the introduction of highly structured machine-based instructional methods, in Europe as well as in the United States. For example, behaviourist ideas lay behind the introduction of 'teaching machines', the forerunners of computer-based teaching, and the use of multiple choice answers in instructional materials that were broken up into small 'learning units'.

Piaget's seminal contribution to theories of learning was that he provided strong arguments against reducing the complex process of learning to a simple

behaviourist view, arguing instead for the importance of the child's own activity in the construction of knowledge. Educational policy was, to some extent, inspired by the Piagetian position. One important development was that 'discovery learning' became a fashionable approach, in which children were offered richly resourced learning environments, and the role of the teacher was reworked as a 'facilitator' of children's own constructive endeavours, rather than purely being a 'transmitter of knowledge'.

However, despite the 'progressive' label attached to such approaches, and the marshalling of Piagetian ideas as a counter to the behaviourist theory of learning, the individualistic constructivist perspective throws up some serious issues that are also open to critical analysis. Perhaps the most damaging of these is the potential that Piaget's theories offer for ethnocentric interpretations of delays in children's development in different socio-economic and cultural circumstances. For example, it is often the case that children in socially disadvantaged groups, or from countries where there is much poverty and hardship, are found to be delayed in their development relative to their more advantaged peers with better standards of living. Given such findings, the view that development is essentially endogenous (i.e. springing from within the child) inevitably leads to the suggestion that such differences are due to inherent deficits in these cultural groups. Highlighting this problem raises the issue of how the relation between culture and the development of thinking can be reconciled with the Piagetian tradition.

Piaget recognized this issue, but he gave little direct attention to the problem, and neither have those who have built on his theory in orthodox ways. However, as we will show during the course of this chapter, the question is closely aligned with a related issue that Piaget did consider to be of great importance; the relation between the development of the individual and what we will call in this chapter 'authority'. By this we mean the influence of those who can exert power and direction over learners in various ways, by their control of resources, communication, time and routine, by virtue of their greater age or greater knowledge, or by holding positions of respect, such as teacher, lecturer or school head. Perret-Clermont (1996) has suggested that the socio-historical context of the first half of the twentieth century and Piaget's own personal biography were sources of the ethical beliefs he came to adopt. These in turn had a major influence on the role he attached to 'authority' in his theory and the image he had of rational thought and what it could achieve.

Piaget lived in Europe through the blind violence of the First and Second World Wars, which he blamed on the prevailing religious and cultural traditions and their autocratic use of authority over people. Perhaps in reaction to this experience, he rejected the notion of 'authority' and placed his faith in rationality and the autonomy of the individual in non-hierarchical social relationships with peers. In line with this way of thinking, he focused his efforts on identifying the conditions that could lead a child towards developing autonomous, critical and rational thought. As a crucial foundation for this, he placed importance on a capacity to reflect on one's own actions and to apply logical reasoning to one's own behaviour as well as to problems in the world. Piaget doubted whether the external, authoritative influences of education and other social institutions could ever do

more than just load children with cultural constraints. This 'baggage' he saw as only giving pre-formed answers to questions that children had neither formulated for themselves, nor attempted to answer in the course of individually developing their own ways of thinking. At the heart of this problem, Piaget believed, lies the asymmetry of status between adult and child, which he saw as constraining children from developing the capacity for autonomous, reflective thought.

This line of thinking is often seen as demoting culture to just a collection of beliefs, social rules and constraints rather than seeing it as providing a legacy of meanings, understandings, narratives and social structures transmitted from one generation to the next. This creates a major problem for seeing how formal teaching can play any kind of role in fostering cognitive development, especially when taken in combination with Piaget's stance that authority inhibits the development of independent thought and reflection. Indeed, Piaget saw formal teaching as an obstacle and a hindrance to cognitive development; for him, interaction between peers was much more important. Piaget's positive view of peer interaction as a fundamental facilitator of cognitive development is an important point, but one that is rarely noted by commentators, who have tended to portray social processes as insignificant in Piagetian theory. And when Piaget himself stressed the importance of peer interactions, he seems to have been unaware that these commonly occur in social settings organized by adults.

Under the banner of 'active learning', some teachers have taken on these three strands of Piaget's thinking (i.e. negative towards authority and positive towards peer collaboration and individual activity) and have concluded that, apart from providing a rich environment, they need to leave children to learn entirely on their own. In contrast to the educational ideology that children learn best by imitating 'correct' models, teachers who wish to be 'Piagetian' seem to feel that they have to stay 'backstage'. Although teachers' direct experience is likely to tell them that an educational environment needs to be carefully structured if it is going to engage children's interest, the received Piagetian view is that organization must come from the children. From this perspective, the teacher must stay in the background, so that their authority and knowledge do not hold back the child. This creates a tension, for example when children might justifiably ask 'If the teacher knows the right answer, why not give it to us rather than expecting us to discover it for ourselves?'.

This approach can be contrasted with more traditional teaching situations, where teachers are likely to seem omnipresent. In such contexts, teachers often start sentences which students are meant to complete (e.g. 'The name of the largest lake in Switzerland is ...?'), and students are then rewarded if they give the 'correct' response. This is a method which is thought to encourage students' participation, but in fact the ultimate aim is for the child to give a response that matches that of the adult. Yet a common theme in both traditional and progressive approaches is that the final aim is for the child to achieve the adult's answer. Is this expectation a type of cultural ethnocentrism, or simply a lack of awareness of cultural constructions?

2.2 Lev Vygotsky and social constructivism

As these difficulties and weaknesses in the Piagetian position have become apparent, various theorists have proposed ways of overcoming them. A contemporary of Piaget, Lev Vygotsky (1896–1934), developed a theory that has also inspired a great deal of original and innovative research and has offered some very useful and practical orientations towards ways of teaching. In contrast to Piaget, Vygotsky's theory placed child–adult interactions at centre stage in development, as the prime channel for the transmission of tools essential for the development of thinking from one generation to the next. His theory thus proposed expert–novice interactions as a key factor in fostering cognitive growth. In this framework, culture plays a vital role, first, in the form of a 'teacher' who takes a tutorial role (using the term 'teacher' in a broad sense, to include parents and older, more able children as well as formal educators) and second, through language and other cultural tools that shape action and thinking. This role involves bridging the gap between the teacher's and the child's levels of competence by connecting with the child's modes of thought and working jointly in what Vygotsky termed the 'zone of proximal development' (see Chapter 7). This is seen as guiding the child towards more advanced forms of thought (i.e. the adult's understanding) by providing him or her with 'tools for thinking' that they can appropriate, one step at a time. By stimulating their students' mental processes, teachers guide students to their way of thinking, by giving them a set of symbolic tools to use in the same ways as teachers do. Then, the students will in turn become able to do this by themselves and it will become their way of thinking.

However, this theory also runs the risk of supporting a form of ethnocentrism. Teachers following this theory could be viewed as placing themselves in an unquestioned position of superior knowledge. For example, the argument against teachers following Vygotsky could be that they, as teachers who possess the cultural tools, make themselves the focus of their students' attention and present these cultural tools as unquestionable.

From a psychological point of view, this image does have some validity. It suggests that learning can be seen as a form of teaching where *passing on knowledge* is the primary process. However, although it offers a partial theory of learning, it is not an adequate theory of development, since all that it explains is how a student comes to resemble a teacher. As can be seen from the way in which Piagetian theory has been used to justify particular educational methods, it is important to distinguish between the basic tenets of the theory concerned and the ways in which it is interpreted and applied by teachers. It is not necessarily that the *theory itself* is flawed or problematic, but rather *how it is applied* in the context of schooling.

Just as Piaget's theory can be better understood as being related to his own, specific historical context and his personal reactions to this, so Vygotsky's theory can be linked to the dominant ideology within which he was located. First, Marxist thinking was the state-sanctioned and preferred mode of explaining many aspects of human life in Soviet Russia, and Vygotsky's theory must be seen in relation to this. It is important to note, for example, that Vygotsky focused on how

individual development was located within, even subservient to, broader socio-cultural development. Second, he also emphasized the role of technology, through his continued reference to tools (in a broad sense, he was referring to what we can call cultural 'tools of thinking' as well as physical artefacts). Third, he saw mental development as springing from the use of tools embedded in social activities. His position was broadly aligned with the Marxist view that the development of thought is the outcome of both material conditions and people's activities and struggles.

However, despite these broad differences between the two theorists, there is a parallel with Piaget's reaction to the context in which he was located. Vygotsky also stressed the individual, constructive aspects of development. He did not see the child as simply a passive recipient of culture's transmission of tools, but also as a creative builder of their own thinking. This was not consonant with the prevailing ideology of Soviet Russia, and Vygotsky's work was not widely published for many years, so it is for this reason that Vygotsky's work is often seen as following Piaget, although in fact the two theorists were to some extent independently developing their ideas at much the same time. Another point of agreement between the two lies in their recognition that biological maturation also plays a role, albeit a secondary one, in making certain developments possible on the cognitive plane.

On balance, Piaget saw the control of development as being essentially inside the child, while Vygotsky saw the child's development as being the internalization of outside influences or social co-ordinations. In his theory, Piaget justified his position by seeing the logical progression of development as arising from children's reflections on their own actions, culminating in the achievement of formal operational thought, that is, fully abstract and hypothetico-deductive reasoning. For Vygotsky, however, this achievement was the result of a social, rather than an individual process.

2.3 George Herbert Mead and symbolic interactionism

A third line of theoretical development is relevant to the theme of this chapter, and, like the two theories discussed above, can also be considered critically in the light of its specific socio-historical context and related ideological background. In the first half of the twentieth century, the dominant culture of the United States was committed to the ideals of personal freedom and opportunity. A dominant motif was the individual striving to achieve, while at the same time developing the qualities of concern for others, citizenship and patriotic allegiance. In this context, George Herbert Mead (1863–1931) developed his theory of the social origins of thinking. He argued that shared, social activity, and specifically the process of communication, was the way in which objects and actions came to have meaning, or, in his terms, 'symbolic significance' (Mead, 1934). According to Mead's 'symbolic interactionism' theory, the 'signs' that at first accompany actions then lift the child's understandings to new, symbolic levesl (by 'signs' he meant verbal and non-verbal gestures that come to represent what is happening). Thus, for example, a child does not understand what a tool is just by virtue of its shape, but rather through its incorporation into meaningful tool use. That is to say, a hammer is not a tool simply in and of itself, but becomes a tool through its use in

appropriate ways by 'significant others". For the child, seeing a hammer used in specific ways by another person and hence in a social context, imbues the object with social significance. Through such repeated experiences whereby objects, actions and language come to acquire social meanings, the child also begins to form simultaneously a representation of the self and of what Mead called the 'generalized other'. This means that the child becomes able to see themselves and their actions from the perspective of another person, and as a result, begins to *internalize* meanings and values. According to Mead, it is this process of internalization that allows children's thinking to advance from the level of immediate experience to a level of self-reflection. Mead believed that this is an important part of children forming a conscious concept of self, and he believed that the play of young children, in which role-playing other people and their activities tends to be common, was a primary vehicle for this development. This stands in contrast to Piaget's view of the role of other people. According to Piaget, play is at first solitary, and then later (as two or more children play together) becomes 'parallel play', where the players merely co-ordinate their behaviour, but do not truly co-operate. Only in Piaget's final stage of development do they properly take account of other people's real or potential perspectives.

The reason why these different interpretations of the role of play are important is that play can be seen as an excellent example of a form of social activity that is not bound by external authority structures, nor by imposed power relations. Although at times one child or another inevitably 'sets the agenda' for where the play is going, in general, play is an activity that children engage in for its own sake, not for its purpose in relation to some defined outcome. The significance of such reciprocal peer relations for development will be explored in more detail as this chapter progresses.

Summary of Section 2

- Piaget, Vygotsky and Mead are three influential theorists of the development of children's cognition.
- The positions adopted by each of these theorists bear some relation to the socio-historical contexts in which they worked.
- Piaget saw cognitive development as a quest for knowledge and essentially a solitary pursuit with the child constructing their own mental processes. This is called an *endogenous* (internal) process.
- Vygotsky saw the child as acquiring cultural tools through social interaction in the 'zone of proximal development', created with a more able partner.
- Mead saw interactions with significant others as providing the child with new meanings, not only for action, but also for reflection, via social signs.
- Both Vygotsky and Mead stressed *exogenous* (external) sources of development.

3 Social interactions and the development of thought

These three theorists' positions on the development of thought and its relation to social processes became widely disseminated throughout the academic communities of Europe and the United States. This led to a recognition of parallels and disagreements among the theories, which formed the background to the emergence of a new genre of research in the 1970s. This was strongly empirically based, and set out to address the new questions posed by the theoretical debates about the extent to which cognitive development is influenced by social factors. In particular, interest focused on how children negotiate and make use of situations involving conflicts of ideas to make progress in their development. This new line of enquiry took a scientific approach, using standardized tasks and situations, often in laboratory settings, to explore how children resolved the intellectual and social problems posed by conflict. This recognition that an intellectual conflict requires both an intellectual solution and a social solution is central to the ideas explored in this chapter. If someone disagrees with you, and you each want to do more than simply register the difference of opinion (i.e. seek some kind of resolution) you need to do the intellectual work of analyzing the nature of the dispute and do the creative work of coming up with something that can satisfy both parties. But, and this is a crucial point, you also have to do equivalent work towards resolving the *social disjunction* that occurs in conflict situations.

Since the 1970s, the issue of the role of socio-cognitive conflict as a stimulus for development has inspired an impressive body of research. Findings from this research have shown clearly how children, adolescents and adults have a capacity to benefit, in terms of developing their modes of thought, from situations in which the joint resolution of cognitive challenges is required (Perret-Clermont, 1979, 1996; Doise and Mugny, 1981; Perret-Clermont and Nicolet, 1986, 2002; Gilly, 1989; Howe *et al.*, 1990, 1995; Azmitia, 1996; Carugati and Selleri, 1996; Carugati, 1997; Littleton and Light, 1999; Schwarz *et al.*, 2000).

The first important finding was that if children work together to solve a problem, they are often able, by co-ordinating their actions, to arrive at cognitive solutions that neither of them are able to reach alone. This shows the limitations of looking solely at what children can achieve by working on their own, and how such an approach can lead to an underestimation of children's levels of cognitive ability. This issue is especially important when children's abilities are being assessed on the basis of their performance in an educational context. It is also worth noting that the asymmetry of power relations that exists in teacher–student interactions is not present in this sort of peer collaboration. We will return to this point in Section 6.

The second important finding was that when children work together in particular ways on tasks that they cannot initially solve alone, they can, even in the short term, become able to tackle tasks of a similar level of difficulty on their own. In this way, cognitive tools that are first constructed jointly to solve

problems in a social situation, then become part of a person's own repertoire of tools that they can use for themselves.

A good example of this is the strategy of only changing one variable at a time if the combined effects of a number of different variables are being explored. This can be a very useful, general-purpose thinking tool, and children are quite likely to begin to formulate such an approach when working together on a problem. They might, for example, find that this offers a way of making the task easier to talk about. Such cognitive tools, although they may initially be used with given materials and in a specific social situation, have a certain degree of stability that often allows them to then be used successfully in other situations and with other materials. In this way, children may be able to generalize their thinking beyond the specific task context in some circumstances.

3.1 Socio-cognitive conflict

The fruitful line of research that we discussed above is guided by the hypothesis that one of the mechanisms by which social interactions can lead to cognitive development is the communication conflicts that arise between partners. The term 'socio-cognitive conflict' has been coined to label this dynamic process that leads to joint cognitive constructions as different (initially incompatible) points of view come into the field of discussion. This hypothesis highlights the crucial functions of conflicting viewpoints and interpersonal communication between partners as they work towards a shared, single response to a problem; to do this they have to 'decentre' from their own, individual perspectives. Of course, the fact that the partners differ in their viewpoints does not necessarily lead to this sort of productive adaptation, since the difference may cause dispute and argument instead. In this case, differences in opinion become much more concerned with the interpersonal relationship than with the task in hand. This is an important point since it stresses that underlying interpersonal relationships are important for a dynamic that in favourable circumstances can lead to productive change and development.

In general, it has become clear that if tasks are solved by simple amicable agreement or by one partner conforming to the other's preferred approach (both of which are solutions to the *social relationship issue* rather than the *task issue*) then neither partner makes progress. Smedslund (1966) hypothesized that it is the shared elaboration of cognitive solutions to communication conflicts that leads to constructive change. It is now clear that such change depends on people agreeing to communicate with each other about the cognitive conflict that happens at the social level as a result of their disagreement.

3.2 Social marking

As a result of studying the effects of changes in the ways in which tasks are presented, a further significant finding has emerged which has identified a process that has been called 'social marking' (Doise, 1986; Rijsman, 1988, 2001; Nicolet, 1995; Carugati and Selleri, 1996). This has helped to show that it is not just the logical structure of a problem that influences success. The match or mismatch of the problem structure with the social rules associated with it is also important, as is the social structure of the partners' interaction. For example, in

the classic Piagetian conservation of liquid task, a child is first asked to confirm that the amounts of liquid in two identical containers are, indeed, the same. Then the liquid from one container is poured into another container with different proportions and the child is asked whether the two amounts of liquid are the same. Children find it much easier to solve this problem correctly if the task is presented as a 'fair shares' reward of a drink to each child for their participation in the experiment. Here, the task of judging whether the two containers hold the same amount is supported by the notions of fairness and equity. This particular social marking is therefore based on the concept of 'distributed justice'. But, of course, social marking is itself subject to meaning construction and how it operates in a particular situation will depend on how the children make sense of the social rules that the adult intends to appeal to. For example, evoking the concept of distributed justice is more effective if children are placed in a co-operative situation than if they are expected to compete with each other. Research that has made use of rules to do with the 'right' to have equal quantities of objects or drink have confirmed this phenomenon.

In this section, then, we have shown two broad patterns of findings regarding the social context of experimental conditions. The first contextual effect that we have found is that the cognitive demands that a task makes of a child, and the child's chances of reaching a solution, do not simply reside in the task itself. They are made harder or easier by the social context of the child, the task and other people. A degree of social conflict around possible routes to solving the task can make the finding of a correct solution easier. Once such a joint solution has been found, through the resolution of the socio-cognitive conflict, it can then be available for the child to apply to new tasks with similar demands when working independently. In this way the child's cognitive development has been fostered. The second important contextual effect that we have highlighted concerns the 'match' of the social context to the rules that have to be applied to the task in hand. For example, as we illustrated in respect of the Piagetian conservation task, a match between task and social context also helps children to come to a successful solution. In the favourable circumstances outlined above, then, children can perform at higher levels than those predicted by theoretical positions that only offer individualistic interpretations of cognitive development, such as those of Piaget.

Summary of Section 3

- 'Socio-cognitive conflict', that arises when two children work together to solve a task, can be an important source of development.
- Children working together can often solve problems that they could not solve on their own.
- Tasks are made easier if there is appropriate 'social marking', where the task maps onto a social rule such as 'fair shares'.

4 Meeting of minds: adult–child intersubjectivity

As suggested in the previous section, the ways in which participants in a social interaction make sense of what is going on between them are important for what they achieve together. They can only collaborate and discuss if to some degree they have a shared understanding of the task. Similarly, they need to be able to attend jointly to the same aspects of the task. This 'intersubjectivity', an area of shared experience, may not always be present at the start of interaction; it may take some time to arrive at shared objects of discourse and thinking.

4.1 The relational context

Several studies have shown that the competence that a person can demonstrate is affected by the form of relationship context that they are in (e.g. Labov, 1972). In addition, the implicit understandings held about a relationship and its rules , the 'communication contract', have been shown to structure the conversation and responses of people being tested (Rommetveit, 1978, 1992). A general question that has interested researchers in this area is how best to describe the tools and socio-cognitive patterns within which abstract thinking is constructed. What is it, in a specific situation, that enables two people to draw out a common understanding of a problem and the same view of what might count as a 'solution'? How do they come to engage jointly with the problem, consider the same aspects, apply the same reasoning and carry this through to a solution?

Research by Schubauer-Leoni (1986b) and Grossen (1988) has helped to clarify how these shared understandings come about when a psychologist and a child, or a teacher and a student, interact in situations that involve a child's ability being assessed or a student engaging in learning. As we will show in the next section, these researchers have devised experimental situations that bring out the particular ways in which adults talk and behave to enable children to show their abilities (for example, in showing a mastery of Piagetian-type thought). They also illustrate the ways in which children construct understandings of what is being talked about by the other person and what is in turn being expected of them, and how they should talk about the topic that is at issue between them.

4.2 Children testing children

To show in concrete terms how this intersubjectivity is constructed between a child and an experimenter, Grossen (1988) set up situations in which one child, who had already succeeded on a particular task, was asked to administer the same task to another child. She used tasks such as the Piagetian conservation of liquids task described in Section 3.2. She noticed that many children who seemed to have constructed an idiosyncratic understanding of the psychologist's role, thought that they should warn their partner that there was a trap, for example by saying 'Now watch carefully. I am going to do something with the liquid. But watch and think about this carefully', or by saying 'Now pay attention, because

there is a trick!'. Other children started the test, but then turned to the researcher, asking 'Now, should I tell her that there is a trick or not?'. Further, Grossen observed that children who were non-conservers (i.e. they believed that moving a quantity of liquid from one container to another of different proportions changed the amount of liquid) tended to produce correspondingly non-conserving responses from the children that they were testing. Conserving children, on the other hand, tended to elicit conserving responses from their partners.

4.3 Psychologists testing children

When psychologists were observed carrying out the same sorts of tests it was also noted that some types of responses were under-valued while other types were over-valued (Perret-Clermont *et al.*, 1992). For example, a psychologist might seem to be trying to 'extract' from a child not simply a statement that the notion of conservation is understood but rather a specific sort of statement that conforms to their expectations of what counts as a 'proper' conserving response. A failure to produce a response of this more restricted type might then be taken as 'non-conserving', even though the 'difficulty' does not actually lie in the child's failure to understand conservation, but rather in their failure to conform with the tester's implicit rules of how language is used to express understanding. Thus, a simple response of 'Yes' to the question 'And do they have the same amount in?' is likely to be less acceptable to the tester than a spontaneous answer such as 'They have got the same amount in because nothing's been added'. Moreover, sometimes a tester will unconsciously give hints as to the expected answer, for example by praising a 'yes' and then waiting for further elaboration, or sometimes giving no hints at all. Or it may be that the person being tested has such rigid, preconceived ideas about the nature of the testing that they will fail to appreciate any hints that they are given and hence fail to converge with the tester's expectations. This points up how the assessment of a person's competence in a particular, narrow domain can be easily confounded by how competent they are in the much broader domain of shared linguistic understanding, in a context where meanings and social rules are being negotiated (Smedslund, 1977; Hundeide, 1985, 1988; Elbers, 1991; Baucal *et al.*, 2002).

In one study, Bell *et al.* (1991), tested students in a number of ways, in particular by asking them to make a 'sutemi' (a nonsense word). They gave each child a raisin, some toothpicks and some paper, and said 'Now make a sutemi for me', but not a single child asked them what on earth they were talking about or said that they did not know what the word 'sutemi' meant. The children seemed able to construct at least some sort of sense from this question, as if it were simply not possible that an adult would ask a nonsense question; if a question is asked, one must attempt an answer! One has to make the best of what is available. This clearly shows how the implicit understandings of the social rules can have a major effect on how tasks are approached. In the situation just described, it seems clear that children hold a strong, implicit belief that one of these rules is that they must attempt to answer an adult's question, however odd it seems.

Summary of Section 4

- The concept of 'intersubjectivity' refers to mutual understandings of what a task is about and the sharing of attention to the same aspects of the task.
- A child's level of performance on a test task, or in a teaching/learning situation, is partly dependant on the expectations that they have about what behaviour is expected and what is appropriate in the specific situation.

5 The 'didactic contract'

In the 1980s, research looking into the links between context, teachers, students and subject area introduced the concept of a 'didactic contract', a special case of Rommetveit's 'communication contract', to refer to the ways of behaving that teachers and students adopt and the rules that they follow (Brousseau, 1980; Chevallard, 1985). There are two sides to this contract. On the student's side there are expectations of what it is to be a learner, and on the teacher's side there are expectations of what it is to be an effective teacher. This implicit contract reflects the knowledge and understandings of what one has to comply with in educational processes in everyday school life.

5.1 The student's view of 'being a student'

Along with the concepts of intersubjectivity and constructions of social rules that we have already introduced, Schubauer-Leoni (1986a, and b, 1996) took up this idea of a 'didactic contract' to examine how a student manages to learn about a topic while maintaining a relationship with their teacher. She described how a student's answers to a teacher's questions can be seen as an outcome of a particular relation with the adult, not just as a response relating to the subject matter. In a classical teaching situation, the roles tend to be clear; there is a teacher who knows things and can ask questions, and there are students who have to respond in 'correct' ways. To explore this relationship, Schubauer-Leoni carried out some elegant experiments which aimed to clarify how children view 'being a student' and 'being a teacher'. Children in the first and second year of primary schooling had to construct problems which they then put to their classmates or younger children to solve. These 'novice teachers' considered that a good problem is one that cannot be solved without mistakes being made. In other words, if students do not get things wrong, then one cannot be sure that one is a good teacher! This means that the child's notion of 'being a teacher' carries the implicit expectation of occupying a superior position.

In some ways adopting this position may make it more difficult for teachers to play a facilitating role in working out joint solutions with children. Schubauer-

Leoni (1990) has also shown how younger children are more successful at solving problems when the tester is a psychologist who is making a game out of a problem-solving situation than if the tester is a teacher. In contrast, children who have had more experience of school are more likely to succeed if the task is presented as a 'school' task and not as a game.

5.2 Task difficulty and context effects

From Schubauer-Leoni's research, it seems that the child's understanding of the rules and expectations of the social context affects the ease or difficulty that they experience in working towards solutions. It is thought that this is because the task is given meaning by the context in which it is located. This has been shown in several other studies (e.g. Rommetveit, 1978; Hundeide, 1985, 1988, 1992; Light and Perret-Clermont, 1989; Säljö, 2000). However, one study in particular shows this effect very clearly. Säljö and Wyndhamn (1993) gave a task, in a mathematics classroom setting, to competent mathematics students aged 15–16 years that involved finding the postal rates for packages of different weights and sizes. Although the students were given a post office tariff chart, which could be easily used to find the answers to the problem directly, they seemed to be unable to use this simple solution but focused instead, inappropriately, on the proportions of the packages. For them, the didactic contract inherent to the classroom setting carried with it the expectation that that they had to be shown how to apply some newly acquired knowledge, not to use ready-made solutions that were close at hand. So it seems that the students were defining the task as different and more difficult than it needed to be because of the way they had constructed the demands of the task's social context.

5.3 How children interpret adults' questions

Another aspect of the significance of children's interpretations of the didactic contract is how children make sense of adults' questions in teaching and testing situations. In situations like this, a child will interpret questions at two levels: first, at the explicit level of what the question actually asks and second, at the level of what the social rules of the situation define as an acceptable answer. The child is not only trying to work out what the meaning of the task is, but also trying to work out the demands of the social relations in which the task is embedded. A key part of this process is the child trying to guess what answer the adult expects, and what response will please them most (Donaldson, 1978). These two aspects may not necessarily align with each other because the logically correct answer may not seem to be the same answer as the one that fits the social demands of the context. A good example of this is provided by the effects of an adult repeating a question. This has been studied in experiments based on the classic Piagetian conservation tasks referred to in Section 3.2. In the Piagetian version of these tasks, when the child's reasoning is tested, the same question is usually asked twice. First, the child is asked, before any changes are made, the question of whether two amounts (of liquid, lengths of string, balls of plasticine etc.) are the same. Then, the adult transforms the shape of one of the amounts (pouring one

amount of liquid into a different container, straightening one length of string, rolling out one ball of plasticine etc.), before asking the child a second time the same question 'Are the amounts the same?'.

But it was found that if this question is *not* asked twice, but only asked once, after the transformation, then children are more likely to give conserving responses, asserting that the quantities have not changed. If both questions are asked, before as well as after the transformation, they are more likely to give non-conserving responses. Why might this be? The idea of the didactic contract helps us to come up with an explanation. In this situation, the child is trying to make sense of the adult's intention, and it is not immediately obvious to the child why the same question is being asked for a second time. People do not usually ask a question if it has already been answered once, and when a *teacher* asks a question twice, it can be taken to mean that they have not been pleased by the first answer, and want a different response. Since the only thing that has changed since the question was first asked is something to do with the materials, a plausible guess is that the tester wants the child to say that the amounts are different!

What this example shows is that, for the child, the implicit social rules of the situation are as much of a problem to be solved as the explicit problem that is being posed. To fail to meet the social expectations, defined by the underlying rules as the child interprets them, would be as much of a failure as a lack of success in solving the explicit problem. In fact, in some situations, getting the socially appropriate response right might be a much more salient issue for the child than getting the explicit answer right.

Although a tester may be genuinely interested in assessing a child's cognitive level, for the child the cognitive demands may be set aside if it is more important for them to be a 'good student', as they see it. The child's sense of what is going on – that they are expected to give responses that meet the adult's expectations – is tied up with their wish to do what they can to maintain the flow of conversation. As a result they are likely to be hesitant at giving responses that are at variance with this sense (Lévy and Grossen, 1991; Perret-Clermont *et al.*, 1992).

The idea of the didactic contract offers a critical reinterpretation of the basis on which children perform in the sorts of tasks that Piaget developed. For him, the ability to conserve was one important marker of a major transition in thinking that signalled the child's progression from one stage of development to the next. His intention in developing all of his ingenious 'tests' was to provide situations that could index clearly the level of cognitive development that a child had reached. Recognizing the significance of the social dimension of this kind of testing throws the feasibility of this aim into question.

Summary of Section 5

- The 'didactic contract' is a term coined to describe the sets of mutual understandings that teachers and students have about the roles of student and teacher.
- Some types of understandings of didactic contracts by children or teachers may have the effect of leading children to perform at levels lower than they might be capable of under different conditions.
- An important aspect of the didactic contract is how it leads to children interpreting teachers' questions in specific ways.

6 The psychology of everyday school life

In the preceding sections, we have referred to several research findings that have highlighted how the social contexts of learning and testing, and how children interpret these contexts, can affect the levels of performance that children show. We have also suggested that this affects the opportunities that they have to advance the levels of their thinking. However, within a conception of cognitive development that stresses the individual origins of cognitive ability, the impact of such studies may be considered limited. They may be viewed, for example, as showing that there are additional variables that affect development, but may not be considered as significant in terms of further implications for theory. However, if social dynamics are considered to be at the centre of the construction of cognitive capacities, this suggests that cognitive development is a much more complex phenomenon. It suggests that these issues of communication, interpretation and negotiation are crucial to the meaning construction that goes on in teaching and learning situations. From this perspective, it seems clear that it is not enough to just study these processes in abstracted, research laboratory situations, but that it is important to study concrete learning contexts in the everyday life of schools, students and teachers.

6.1 How classroom conversation constructs meaning

Classrooms are rather special places. They are a particular type of setting in which there are always specific sets of expectations about social interaction, communication and learning that underpin the exchanges between teachers and students. Almost without exception, classroom conversations are defined by particular types of asymmetric relations. These are a consequence of the understandings that the participants hold, their respective statuses and the institutional powers of the teacher, especially as shown in the time management, social control and assessment practices that they impose. Teacher–student

conversations, as a result, are structured in very different ways from most other situations in everyday life.

The implicit assumption that guides most classroom activity is that the teacher poses the questions and knows the right answers. On this basis, a teacher evaluates the student's responses and then uses this information to judge the student's level of competence. Where a group of children show that they understand and accept this basic, underlying social rule, the flow of communication in their classroom is then well regulated on the basis of this consensus. This is generally seen as best fitted to meeting the mutual expectations for good teaching. Edwards and Mercer (1987) and Mercer (1995) have shown how, in classes of 8–10-year-old students, classroom activity and the teacher's language use build shared understandings about these basic social rules which students then use to attribute meaning to their interactions. The teacher uses language to point up and mark these implicit understandings, so that the way talk is organized and used in the classroom by the teacher develops a shared vocabulary which fixes the respective roles of teacher and student. This sets up the particular perspective in which the teacher is expected to lead the student along a path to the acquisition of new concepts and the reorganization and extension of knowledge.

6.2 Classroom discourse and cognitive development

The way in which teachers use language is clearly important for how children acquire knowledge in schools, so it is necessary to consider how the special forms of communication that characterize 'teacher talk' affect children's cognitive development. One of the prime objectives of schooling, after all, is to engage students in forms of learning that bring about changes in their ways of thinking and help them to integrate new knowledge with that which they already possess. Here we might usefully refer to Vygotsky's (1934, 1962) concept of working in the zone of proximal development, that highlights the developmental importance of the difference between what a child can achieve alone and what they can achieve with the help of a more able person.

In the classroom, language is the primary medium through which this asymmetric interaction between teacher and student proceeds and it is also language that supports the interactions that integrate and enrich children's thinking. This position that children's discourse is not just a mirror of their thinking but also the means by which their thinking develops, has guided many studies of classroom discourse in recent years. In real classroom life, many interaction situations, especially those in which the teacher intervenes, cannot truly be described as real debates. Even if they have the superficial appearance of a debate, the underlying social expectations are very likely to be that students should give responses that conform to the teacher's verbally or non-verbally expressed expectations. For example, if a child's response to a question is greeted by silence from the teacher, the child will probably take this silence as a criticism that can only be dealt with by changing the response. A different response is then

based not just on a reflective analysis of the answer but also on the child's perception that they need to give a different, more 'correct' response.

A specific type of classroom dialogue that has attracted the interest of researchers is where groups of children seem to be able to develop new understandings through 'externalized reasoning' where they all participate in more of a true debate. In this sort of situation, the teacher's interventions take on a different meaning. Their role can be to get closer to understanding the students' modes of thought, rather than encouraging the student to better understand the teacher's thought processes. Rather than guide them along a preconceived path, the teacher may facilitate the students' discourse and cognitive processes to support the development of new understandings (Mercer, 1995).

These insights have led to a major shift in perspective that now puts at centre stage the relationship between student–teacher debate and the development of thinking (Pontecorvo, *et al.*, 1991; Pontecorvo, 1993; DeGroot and Schwarz, 2003; Schwarz *et al.*, 2003). Seeing the classroom situation as a context in which characteristic types of conversational events take place, where the development of modes of thought are either facilitated or hindered, points up the reciprocal relation between the social milieu and the knowledge of the child (Barth, 1994). The shared cultural practices of school life, the objects that they involve and the communication patterns within them all contribute to a 'referential framework' (Resnick, 1991) for the teaching and learning process.

6.3 Does knowledge transfer out of the classroom?

Schooling is commonly accepted as being a means of equipping children with knowledge that is of value to them outside and after their school-based experiences. The question then arises as to how children make use, in other situations, of knowledge first gained within a didactic contract. In a range of studies, simple arithmetic problems (addition and subtraction) were given to primary school students, sometimes in the classroom and sometimes outside in a nearby room (Schubauer-Leoni and Perret-Clermont, 1997). Young primary school children can easily solve the following problem: 'I make a bunch of five flowers, then I put in another three, then I meet a friend and give him two of my flowers. How many flowers do I have left?'. When they are asked in the classroom, students give brief but adequate 'arithmetic' responses. However, when asked outside the class, on their own with an adult who is not a teacher, they are much more likely to make detailed drawings and give elaborated narratives, for example: 'How did I do it? I put them together, I made a pretty bunch. I found my friend and gave him the blue flowers ...', thus transforming the bunch of flowers into a narrative problem rather than a problem of arithmetic. This has led to an exploration of the implicit understandings of these 'situated problems'. What is it that makes the same problem, presented in the same way but in different situations, produce such very different solutions? Researchers have been puzzled at the findings that, outside the classroom, neither children nor adults tend to use the knowledge gained in school and, in particular, they

rarely use arithmetic approaches even when these have been studied and learned in the school setting.

As we saw in Chapter 7, research on this theme was carried out in Recife in Northern Brazil by Nunes *et al.* (1993) who studied the mathematical abilities of street children. At ages of 6 or 7, the researchers found that these children are already surviving independently by re-selling oranges, or doing small jobs, and some of them quickly become highly accurate in working out monetary transactions and giving the correct change. Yet these same children systematically fail in mathematics in their first year of schooling and tend to be rapidly rejected by the educational system. Why is it that they are unable to transfer the knowledge acquired from their street life to school tasks? On the streets, children learn highly complex algorithms to deal efficiently with the buying and selling situations that they encounter, situations that demand accurate calculation. In the school situation, the teacher does not know that the students already possess these practical techniques and when they spontaneously use them in class the teacher tends to treat their strategies as clumsy or incorrect. This then contradicts the children's experiences and does not allow them to reflect on the strengths and limitations of these strategies (in large part oral) that they use in their commercial transactions.

The question thrown up by this research is the nature and extent to which there is a link between the context in which one acquires knowledge and the context in which it is used or transferred, since the desired transfer of knowledge and skills often fails to occur. There can be many reasons for this; perhaps the teacher fails to understand the significance of this aspect, or fails to clarify it, or perhaps the students themselves fail to grasp the relations between the knowledge they have gained in one situation and that required in another. It may also be the case, at times, that knowledge is context-bound without any of the participants being aware of this. Thus we have to consider further the three-way relations in the triangle of teacher, student and knowledge.

6.4 The developmental triangle

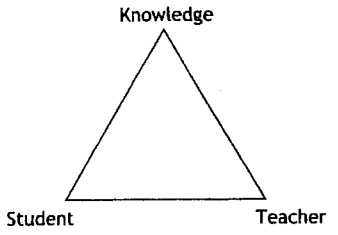

Figure 1 The developmental triangle.

In respect of the three points of this triangle shown in Figure 1, developmental psychology has tended just to focus on one point, the student. Research has been primarily concerned with how the student thinks, the stages that he or she goes through, his or her developing modes of thought and what it means to behave

well as a student. We have shown so far in this chapter how the development of the individual's knowledge cannot be easily isolated from the other two points, the teacher and the object of knowledge itself, since all of these are situated within an institutional and cultural context. We have also tried to show how much there is to be gained in enriching understandings of cognitive development by considering all three points together. Generally, trainee teachers see knowledge as being their focus, so, for example, in mathematics they may concentrate on how to design a series of lessons, how to demonstrate a formula or how to choose examples to be worked through. We would argue that this is a narrow view of teaching and that to study this aspect unquestioningly, without also considering the other points of the triangle and their relations, is too limited and reductionist.

As far as the teacher is concerned, theoretical and research interest has mainly tended to focus on the socio-emotional aspects of the teacher–student relationship rather than on the ways in which the teacher represents the child's points of view. It has also tended to see teaching in relation to the evaluation of student abilities. It is only very recently that studies have been conducted on how teachers think about intelligence, learning and development, and their mental models of students (for an exposition of the dynamics of causal attributions see Monteil, 1989; with respect to the educational implications of social representations, see Mugny and Carugati, 1985; Selleri *et al.*, 1994; Carugati and Selleri,1996). However, little is known about the reasons why teachers find it difficult to decentre from their own points of view.

The study of this teacher–student–knowledge triangle in teaching situations is becoming increasingly important. How do teacher-trainers, teachers themselves and psychologists studying 'the triangle' see it functioning? The implicit didactic contract seems to be that the teacher sets tasks that correspond with what he or she wishes the students to know. Because students come to understand what they are expected to know, they then expect to be given exercises that will lead to success in the task. One can talk of a genuine 'micro-culture', with slogans such as 'You have to do this, because it is how you learn properly'; 'If you do it in this way, you get a good mark'; 'If you do this, it means that you have understood'. In other words, students' responses and the roles that they take on are not spontaneous constructions, but are the product of particular teaching practices.

So how can these issues around the meanings of learning situations and the corresponding expected behaviour(s) be addressed? A crucial theme here is the modes of constructing shared understandings between teacher and students that support or do not support students in discovering the knowledge that the teacher wishes to transmit. In what circumstances do children genuinely learn what one is seeking to teach them? The school system and the life of the classroom are usually sufficiently based on well-oiled daily routines to allow students to respond correctly without having properly understood. Students do not often see the aim of schoolwork as being to gain *understanding*, but rather to pass tests successfully. For students, essential achievements are to gain a satisfactory mark for homework, to meet the teacher's expectations and to show that they know what they ought to know. To understand is an optional bonus! This is often what happens if, when a

teacher says 'try to understand', the student hears this as 'try to understand how you have to answer, so that I believe that you have understood'! Some students even gain good qualifications without ever having properly experienced the satisfaction of having truly understood something. We believe that to understand is an autonomous act, internal and free, which does not depend on hierarchical structures, nor can it be prescribed or demanded. So there is a risk that this level of deep comprehension, if it has not been experienced, may end up playing no part in the students' field of experience, or even in their expectations.

Summary of Section 6

- In real-life classrooms, implicit didactic contracts are established and maintained, and they constrain meaning, discourse and thinking.
- 'Classroom knowledge' tends to be marked out as involving specific forms of discourse.
- Some forms of discourse (exploratory talk, debate and the resolution of disagreements) are more likely to foster the development of thinking.
- Classroom knowledge does not necessarily always transfer well to other contexts, not vice versa.

7 The socio-cognitive perspective

The methods and scientific culture of modern social psychology aim to focus attention on and develop understanding of the ways in which the individual and the collective are connected. Willem Doise, a social psychologist who has been concerned with this chapter's topic of interest, has differentiated four levels of analysis which can serve as points of entry for studying these connections (Doise, 1982). In this section we make use of these four levels to organize what we have already covered in this chapter, and to see what insights they can offer into the learning process.

We hope that our preceding arguments have shown convincingly that cognitive development is not just the result of a simple maturation of an innate potential nor is it a simple behaviourist stimulus-response process. It does not result solely from social transmission, pouring knowledge into empty vessels. The recent research that we have discussed in this chapter is beginning to reveal the complexity of the processes that support the development of modes of thinking. That one person can appropriate the knowledge of another, that each generation can build on the experience of the previous one, that cultural life can shape and transform thinking (Bruner 1990, 1991) and that it is possible for new, creative thoughts and ideas to emerge ... these are phenomena that seem miraculous when examined in detail.

7.1 Levels of analysis for socio-cognitive research

Level one – the individual

This first level of analysis is located in the individual student in search of greater understanding. At this level, a student is focused on as a person with a cognitive and an emotional life and a need to establish their identity, and as always engaged in the crucial business of seeking meanings. As well as *acquiring knowledge*, the individual also *makes use of knowledge* to interpret and give meaning to the social contexts in which they find themselves. As well as negotiating the complexities of new forms of thinking and new areas of knowledge, they are equally concerned with negotiating all the social challenges that come their way in handling relationships with peers and more powerful adults.

Level two – interpersonal interaction

The individual person's quest for knowledge, development and meaning described at level one does not take place in a vacuum, but instead, it is situated in relations with other people. At this second level of analysis, attention is focused on interpersonal relations. This level includes all the aspects of interactional dynamics, both the verbal and non-verbal communications through which questions and responses, conflicts and solutions, and interpretations and expectations are formulated and resolved at the collective level. In particular we can observe how intersubjectivity is built out of sharing roles and communication (or didactic contracts), sharing concrete experiences of specific situations and their tasks, and resolving conflicts between differing points of view. This leads to the establishment of shared frames of reference.

Level three – roles and statuses

At this level the dynamics of the development of intersubjective understandings are constructed by intergroup relationships, institutional practices and social rules that govern both the forms and the contents of people's interactions, their expectations and prejudices, and their social attributions of successes and failures. Positions of control, such as those of teacher, give some individuals a special status in defining what counts and what does not count as appropriate behaviour in particular settings. In turn, there are certain expected behaviours associated with the role of student. However, from a psychological point of view, these positions are not just 'givens'. They are themselves learned and negotiated in social situations by individuals with their own personal agendas.

Level four – social representations

The focus at this level is on implicit expectations, traditions and established narratives about what count as teaching, learning and cognitive development. It includes a concern with values, cultural expectations of individuals and collective forms of action. It also includes such social representations as 'what it is to be a teacher', 'what counts as intelligence' or 'what is established knowledge' (Gilly, 1980; Emiliani and Molinari, 1989). Thus the notion of adults acting in

professional teaching capacities, with formally given responsibilities for the education of young people is also in itself a social representation, which affects the activities at the lower levels of this analysis. In turn, the experiences of individuals, dyads, classes, schools and experiments may transform existing social representations.

Summary of Section 7

- Doise has proposed that the social nature of cognition can be analysed at four different levels. These four levels focus on different objects of concern.
- Level 1 is the level of the individual engaged in constructing their modes of thought and their knowledge, trying to make sense of their experience.
- Level 2 is the level of actual relationships, interaction and discourse, for example, student–teacher or peer–peer expectations. It focuses on, for instance, the construction of intersubjectivity and mutual expectations.
- Level 3 refers to roles and statuses that frame and constrain the sorts of behaviour that are considered 'proper' for teaching and learning in different contexts.
- Level 4 is the level of national policies and ideologies, systems of social representations, that define situations (such as schools) in specific ways. These may often be dictated by professional training and traditions, and by government policies that define situations in specific ways. But these are always reinterpreted by the participants, for example by teachers and students in specific schools and situations.
- These levels are not independent: one level can affect or transform another.

8 Conclusion

In this chapter we have set out to show how communication contracts and didactic contracts, both of which are largely implicit, govern the transmission of understandings and the conditions of learning. Learning lies at the heart of specific ways of relating which are closely interlinked with the rest of the daily life of the class. Learning is also linked more generally with the ways in which the school operates so as to organize understandings and the dynamics of teacher–student interaction. We have also explained the importance of the ways in which teachers and students construct their own meanings for these practices and traditions. The transmission of experience and knowledge from one generation to the next is seen as something that can be appropriated and interpreted. It can become both a personal and also a collective acquisition, and is thus not a

'miracle' in the sense of magic wand-waving, but instead is a 'technical miracle' of human communication. More precisely, it is a form of social engineering and complex didactics which creates 'spaces for thinking'. These function as transitional zones, bringing about a restructuring of cognitive understanding arising from mutuality, the experience of 'otherness' and the realities of social interaction (Perret-Clermont, 2000; Perret and Perret-Clemont, 2001; Perret-Clemont and Zittoun, 2002).

Seen from a social psychological point of view, learning, in the double sense of 'gaining knowledge from another' and 'developing new competencies' (new for self and also, at times, collectively new) shows itself to be an eminently cultural activity that only takes place if it is socially organized and personally significant. If you, the reader, have accepted the arguments put forward here, you have seen that the understanding of learning processes that we have presented here (which does not exhaust its complexity!) is not the fruit of a series of deductions derived from a set of prior theoretical beliefs, but rather the result of work carried out by researchers seeking to find commonalities in their empirical findings (natural observations, investigations and experiments, analyses of teaching approaches and students' difficulties etc.) and discussing their interpretations of these. As yet, no single theoretical model has been able to account for the complexity of this reality. In this debate among researchers, models are being tested, brought into question and replaced by others in order to, step by step, develop an elaborated understanding of this field of study.

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