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## **DEVELOPING DIALOGUES**

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This chapter is about how children learn to use language as a tool for thinking, collectively and alone, and how other people use language to help them do so. I want to argue two main points: first, that the prime aim of education ought to be to help children learn how to use language effectively as a tool for thinking collectively; and secondly that classroom-based involvement in culturally-based ways of thinking collectively can make a significant contribution to the development of individual children's intellectual ability. To do so, I first draw on research about parent-child interaction to discuss the relationship between children's engagement in dialogue and the development of their understanding. I then shift the focus to schools. Drawing on classroom-based research, I describe classroom-based education as a dialogic process, in which both talk between teachers and learners and talk amongst learners have important roles to play. In these ways I intend to illustrate the practical educational value of research based on a sociocultural or CHAT perspective. But as well as serving some useful practical ends, I also hope to show how this kind of research can provide answers to some intriguing theoretical questions about the relationship between thought, language and social activity.

The founding father of sociocultural research, Lev Vygotsky (1978), proposed that there is a close relationship between the use of language as a cultural tool (in social interaction) and the use of language as a psychological tool (for organising our own, individual thinking). He also suggested that our involvement in joint activities can generate new understandings which we then 'internalise' as individual knowledge and capabilities. Although developmental psychologists have treated his claims about the connections between 'intermental' and 'intramental' activity with great interest, surprisingly little evidence has been offered to support or refute them. Towards the end of this chapter I will describe some classroom-based research which has provided such

evidence.

### **Development from a Sociocultural Perspective**

The central idea underpinning the sociocultural perspective on human intellectual development is that individual development is integrated with the longer-term historical development of our species; and that language plays a vital role in achieving this integration. Psychological and anthropological studies of adult-child relations, observed in many cultures, support the view that growing up is an 'apprenticeship in thinking', an induction into ways with words and ways of thinking which is achieved through dialogue. (For example, Heath, 1983; Rogoff, 1990, 1995; Wells, 1986.) This research has highlighted the importance of the role that parents and other people play in helping children learn, in the course of everyday joint activity. However, little of that research has been concerned with the activity of adults as self-conscious teachers or instructors, or in the ways children seek guidance or information to improve their understanding. Adults do not only allow children to participate in family activities, they also deliberately provide them with information and explanations and instruct them in ways to behave. And children, for their part, may take active roles in soliciting help or obtaining information and transforming what they are given into their own new understanding. They can also contest what they are told, by adults or other children, and gain understanding from engaging in argument.

I can begin to illustrate these points through the following sequence of dialogue. It comes from a conversation with my daughter Anna, which happened when she was two years old. At that time, I was regularly recording our talk in joint activities. On this occasion, the topic of our conversation had continued from a little earlier the same evening when, for the first time, she had seen bats flying round the house. I had pointed to the eaves, where I had said the bats slept.

Sequence 1: Bats in the roof

Me: What did you think of the bats?

Anna: What?

Me: Did you like the bats?

Anna: Yeh.

Me: Think of those bats now, they're out flying around now. Aren't they?

Anna: They not going - are they lying on the roof?

Me: What about them?

Anna: Lie on the roof.

Me: Oh yeh.

Anna: They not, but not inside.

Me: Yeh, I think they do go inside the roof.

Anna: But not in.

Me: You don't think so?

Anna: Not in!

Me: Not in the roof? I think they go inside the roof. That's where they go to sleep in the day.

Anna: (sounding confused) But they, they not going inside it.

Me: Why? (laughing) Why do you think that?

Anna: (also laughing) But they are not going inside it.

Me: They can get inside it. There are little kind of holes round the edge of the roof, at the top of the walls and they creep in there.

Anna: They go there to bye-byes now?

Me: Yeh- no, they go to bye-byes in the day. They're just coming out now.

Anna: Are they not going to bye-byes now?

Me: No, they go to bye-byes in the day, in the morning, and they fly around all night. They get up at night and go out.

It seems that our earlier conversation, while watching the bats, had left Anna with some intellectual dissatisfaction with what she had heard me explain about the life style of the bats. This motivated her to ask whether the bats' habit was to sleep lying on the roof, thus questioning my own earlier statement that they slept inside it. As can be seen from the transcript, when I would not confirm her existing belief, she reiterated it four times, continuing to do so until I offered a more elaborated explanation of how the bats might

enter the roof. She seemed to accept this explanation as reasonable, because in her next statement she asked if the bats were now going 'there' to sleep. As we continued on this topic, it became apparent to me that she did not understand that the bats were nocturnal, and so I tried also to explain this feature of their lifestyle.

One thing that interests me about Sequence 1 is that both explanations which I provided were about matters raised by her, not by me. The information children gain through language may sometimes be, or at least appear to be, incompatible with experience gained in other ways, or with their existing understandings which have been formed through past experience. Language provides both a means for generating a motivating kind of cognitive conflict and also a means for resolving it. Using language, children can actively test their understanding against that of others, and may use argument to elicit relevant information and explanations from adults and other children about what they perceive - and what they want to know.

### **Adult Guidance**

Observations by researchers of the casual adult-child interactions of everyday life have revealed that adults often rely on particular techniques or guidance strategies for generating a common frame of reference during an episode of teaching-and-learning. For example, Wertsch (1985) observed parents of young children using two rather similar techniques. The first, which he calls 'establishing a referential perspective', is when an adult responds to a child's apparent lack of comprehension by referring to other shared knowledge. Imagine, for instance, that while on a country walk a parent says to a child 'Look, there's a tractor'. If this reference fails (that is, the child doesn't seem to realize which object is being referred to), the adult may then say something like 'Can you see, that big green thing with enormous wheels in the field?' In doing this, the adult is drawing on resources of common knowledge to build a shared contextual frame of reference, based on the reasonable assumption that the child's understanding of basic features like colour and appearance will help them identify the strange object in question. Coupled with this technique, adults use a kind of reverse process which Wertsch calls 'abbreviation'. This is when, over the course of time, an adult begins to

assume that new common knowledge has been successfully established and so, when talking to the child, makes progressively more abbreviated or cryptic references to what is being discussed. For example, the next time the same parent and child are out in the countryside, the parent may first point out 'another big green tractor', but then later just refer to 'the tractor'. In these ways, by creating common knowledge and then gradually assuming its existence, the adult first provides a 'scaffolding' to support the child's developing understanding and then dismantles it as the child becomes able to sustain their new understanding independently. It is important to note that from such experiences the child can gain not only a better understanding of the experience being discussed with the adult, but also of how language can be used effectively as a tool for describing and consolidating shared experience.

Research in schools has revealed that teachers also depend on the use of particular linguistic strategies for guiding, monitoring and assessing the activities they organize for their pupils (in ways described in Edwards and Mercer, 1987; Mercer, 1995). All teachers ask their pupils a lot of questions. Most teachers also regularly offer their classes recaps -- summaries of what they consider to be the salient features of a past event -- which can help students to relate current activity to past experience. Teachers also often elaborate and reformulate the contributions made to classroom dialogue by pupils (for example in response to a teacher's questions) as a way of clarifying what has been said for the benefit of others, and also of making connections between the content of children's utterances and the technical terminology of the curriculum (Lemke 1990; Wells, 1999). These strategies seem to be in common use throughout the world, even though teaching styles and ways of organizing classrooms vary within and across cultures (see Edwards and Westgate, 1994 and Mercer, 1995 for a review of relevant research).

Of course, as with the tools of any trade, teachers can use these common discursive strategies relatively well or badly. To make such an evaluation, we need to consider what their intended educational purpose might be. For a teacher to teach and a learner to learn, both partners need to use talk and joint activity to create a shared framework of

understanding from the resources of their common knowledge and common interests or goals. Talk is the principal tool for creating this framework, and by questioning, recapping, reformulating, elaborating and so on teachers are usually seeking to draw pupils into a shared understanding of the activities in which they are engaged. I find it useful to think of this shared understanding as an 'intermental development zone' (IDZ) in which educational activity takes place. The IDZ is a dynamic frame of reference which is reconstituted constantly as the dialogue continues, so enabling the teacher and learner to think together through the activity in which they are involved. If the quality of the IDZ is successfully maintained, misunderstandings will be minimised and motivations will be maximized. If this is successful, the teacher will be able to help the learner transcend their established capabilities and to consolidate their experience in the zone as improved capability and understanding. If the dialogue fails to keep minds mutually attuned, however, the IDZ collapses and the scaffolded learning grinds to a halt.

The IDZ is a mutual achievement, dependent on the interactive participation and commitment of both teacher and learner; but a teacher must take special responsibility for its creation and maintenance. It is a continuing, contextualizing framework for joint activity, whose effectiveness is likely to depend on how well a teacher can create and maintain connections between the curriculum-based goals of activity and a learner's existing knowledge, capabilities and motivations. (I discuss the relationship between the idea of the IDZ and the well-established sociocultural concepts of 'scaffolding' and the Zone of Proximal Development in Mercer, 2000, Chapter 6.) In the next section I will describe some ways in which teachers can most successfully develop an IDZ with their pupils and help them make the most of their educational experience.

### **Some Characteristics of Effective Teaching**

For several years now, I have been involved in research on how teachers use language as the principal tool of their trade. Based in primary schools in England and in Mexico, one of the aims of this research has been to improve the quality of classroom education. The Mexican strand of this research, led by Sylvia Rojas-Drummond at the Autonomous University of Mexico (UNAM), has compared teachers in state schools whose pupils

had been found to develop particularly well in reading comprehension and mathematical problem-solving, with teachers in similar schools whose pupils have not made such significant achievements. Using video recordings of classroom interactions, the Mexican researchers and I tried to discover if the better teachers differed from those who were less successful in the ways they interacted with their pupils. Essentially, we were trying to see if the better teachers were providing a more effective 'scaffolding' for their pupils' learning. We were also interested in what kinds of learning teachers appeared to be encouraging.

Our analysis covered several features of classroom interaction, including teachers' uses of questions. We looked at the content of tasks, activities and discussions, at the extent to which teachers encouraged pupils to talk together, and the kinds of explanations and instructions teachers provided to pupils for the tasks they set them. The results of this time-consuming and complex analysis (described in more detail elsewhere: Rojas-Drummond, S., Hernandez, G., Velez, M. & Villagran, G.1998; Wegerif, Rojas-Drummond and Mercer, 1999; Mercer, 1998; Rojas-Drummond, in press) can be summarised as follows. We found that the more effective teachers could be distinguished by the following characteristics:

(1) They used question-and-answer sequences not just to test knowledge, but also to guide the development of understanding. These teachers often used questions to discover the initial levels of pupils' understanding and adjust their teaching accordingly, and used 'why' questions to get pupils to reason and reflect about what they were doing.

(2) They taught not just 'subject content', but also procedures for solving problems and making sense of experience. This included teachers demonstrating the use of problem solving strategies for children, explaining to children the meaning and purpose of classroom activities, and using their interactions with children as opportunities for encouraging children to make explicit their own thought processes.

(3) They treated learning as a social, communicative process. As I mentioned, earlier

research has shown that most teachers make regular use of a set of conventional dialogic techniques -- question-and-answer sessions, recaps, reformulations and so on. The more effective teachers used these effectively to do such things as encouraging pupils to give reasons for their views, organising interchanges of ideas and mutual support amongst pupils and generally encouraging pupils to take a more active, vocal role in classroom events (cf. Nassaji & Wells, 2000).

The findings of our research are in accord with those of other researchers (see for example Brown and Palinscar, 1989). This has encouraged my colleagues and me -- and the teachers with whom we have been working closely in both the UK and Mexico -- to believe that it is useful for teachers to become aware of the techniques they use in dialogue and what they are trying to achieve through using them. Teachers have found this approach useful for examining their own practice. Even very good teachers, who probably do these things without being aware that they do so, seem nevertheless to appreciate gaining this meta-awareness.

As I suggested earlier, effective teaching does not simply depend on the use of particular language techniques, it depends on how they are used to create and maintain IDZs. The better Mexican teachers and those who were less effective were all using elicitations, recaps, reformulations and other conventional features of the everyday language of classroom life. The crucial difference between the two sets of teachers was how and when they used them, and what they used them to teach. They differed significantly in the extent they used dialogue to help children see the relevance of past experience and common knowledge, and in the opportunities they provided for children to explain their own understanding or misunderstanding. When setting up activities or reviewing them with children, the most effective teachers used language to support and guide the children's activity. They also encouraged more active and extended participation in dialogue on the part of the children.

The extent to which the children themselves contribute to the establishment and maintenance of an IDZ is of course crucial. That is, the 'ground rules' of classroom

interaction must offer them legitimate opportunities to express their uncertainties and reveal their confusions, and to request information and explanations from others who are more knowledgeable. We concluded that the quality of children's educational experience is significantly affected by the extent to which their dialogue with the teacher gives what they are doing in class a continuity of meaning (so that activity is contextualized by the history of past experience) and a comprehensible and worthwhile purpose.

These findings encouraged us to conclude that a good primary school teacher is not simply the instructor or facilitator of the learning of a large and disparate set of individuals, but rather the creator of a particular quality of intermental environment - a 'community of enquiry' (Lipman, 1970; Wells, 1999, this volume) in which students can take active and reflective roles in the development of their own understanding. In such classrooms, the students are apprentices in collective thinking, under the expert guidance of their teacher. I will return to these matters shortly, after some consideration of talk among children when a teacher or other 'expert' adult is not involved.

### **Talk among Learners**

A sociocultural perspective helps us appreciate the reciprocal relationship between individual thinking and the collective intellectual activities of groups. We use language to transform individual thought into collective thought and action, and also to make personal interpretations of shared experience. Not only the intellectual development of early childhood but the whole of human life depends on the maintenance of a dynamic relationship between the 'intramental' and the 'intermental'. So far, I have focused on how the pursuit of intermentality figures in the relationships between adults as 'experts' and children as 'novices'. But as well as learning from the guidance and example of adults, children (and novices of all ages) also learn the skills of thinking collectively by acting and talking with each other. Any account of intellectual development which was based only on the study of dialogues between older and younger generations of a community would therefore be inadequate. Members of a younger generation use language among themselves to generate their own, shared understandings and to pursue their own interests. Each generation is active in creating the new knowledge they want and, in

doing so, the communal resources of the language toolkit may be transformed. Yet even the rebellious creativity of a new generation is, in part, the product of a dialogue between generations.

Language offers children a means for simulating events together in play, in ways which may enable the participants to make better sense of the actual experiences on which the play is based. Elbers (1994) provides some excellent examples of children engaged in this kind of play activity. Like many children, when they were aged 6 and 7, his two daughters enjoyed setting up play 'schools' together with toy animals. They would act out scenarios in which, with one of them as the teacher, the assembled creatures would act out the routines of a school day. But Elbers noticed that one typical feature of their play school was that incidents that disrupted classroom life took place with surprising frequency. Here is one such example (translated by Elbers from the Dutch). Margareet is the elder girl, being nearly 8 years old, and here takes the role of the teacher. Elisabeth, her younger (6-year-old) sister, acts out the role of a rather naughty pupil.

#### Sequence 2: Play school

- Margareet: Children, sit down.
- Elisabeth: I have to go to the toilet, Miss.
- Margareet: Now, children, be quiet.
- Elisabeth: I have to go to the toilet.
- Margareet: I want to tell you something.
- Elisabeth: (loud) I have to go to the toilet!
- Margareet: (chuckles) Wait a second.
- Elisabeth: (with emphasis) Miss, I have to go to the toilet!!
- Margareet: OK, you can go.
- Elisabeth: (cheekily) Where is it? (laughs)
- Margareet: Over there, under that box, the one with the animals on, where the dangerous animals ...(chuckles) under there.
- Elisabeth: Really?
- Margareet: Yes.

(Elbers, op. cit. p. 230.)

In this sequence we can see a child appropriating an adult's way with words. 'Now, children, be quiet' is exactly the kind of teacher-talk that Margareet will have heard every day in 'real' school. But Elbers suggests we can also interpret this sequence as an example of children reflecting together on the rules which govern their behaviour in school, and how the robustness of these rules can be tested. They can play with ideas of power and control without risking the community sanctions which such behaviour would incur in 'real life'. Teachers normally have to be obeyed, and children are not meant to leave the class during lessons - but given the legitimate excuse of having to go to the toilet, how can a child not get her way? Sometimes, in setting up this kind of activity, the girls (out of role) would discuss how best to ensure that such disruptive incidents occurred. For example:

### Sequence 3: Setting up the play school

Margareet: You should choose four children who always talk the most; those children must sit at the front near the teacher. It'll be fun if they talk.

Elisabeth: (to one of the toy pupils) You, you sit here and talk, right?

Margareet: The desks are behind each other, then they can only.. then I have to turn round all the time, if the children talk.

(Elbers, op. cit. p. 231.)

These kinds of examples illustrate something important about how language use in play activities may contribute to children's development. Language can be used by them to simulate social life, to create virtual contexts in which they can practice using the genres of their culture to think together about their shared experience in the communities in which they are cultural apprentices. That is, language enables children to think together about social experience; and social experience enables them to acquire and practice ways of using language to think collectively. For children, playing with discourses is an important way of assimilating the language resources of the community in which they

are growing up. This kind of 'adult' talk is particularly common in the classroom 'home' corner in the early years of school.

### **Learning to Engage in Collective Reasoning**

In everyday life outside school, the 'ground rules' of everyday communication are usually taken for granted, and there is little meta-discussion or joint reflection on how things are normally done. This indicates a clear and useful role for schools, which are special institutional settings created for guiding intellectual development and understanding. Education should help children gain a greater awareness and appreciation of the discourse repertoire of wider society and how it is used to create knowledge and to get things done. Some valuable, practical ways of using language may not be used much in the informal activities of everyday childhood life, and so children can hardly be expected to learn them there. School life should give them access to ways of using language which their out-of-school experience may not have revealed. It should help them extend their repertoire of language genres and so enable them to use language more effectively as a means for learning, pursuing interests, developing shared understanding and - crucially - reasoning and solving problems together. There is little evidence, however, that this role is recognized within most education systems, or carried out by most teachers. The use of language as a toolkit for collective reasoning is not a common topic in classroom talk, nor does it figure explicitly in any school curriculum I have seen (but see Pontecorvo and Sterponi, this volume). In all levels of education, from primary school to university, students usually seem to be expected to work out the 'ground rules' of effective discussion for themselves.

Classroom research has also shown very clearly that in most of the dialogue between teachers and pupils, it is rare for pupils to ask the teacher questions, and even less common for pupils to challenge explanations or interpretations of events that are offered by teachers. That is, the kind of interrogative exchange that took place between Anna and myself in Sequence 1 would be unlikely to occur in a classroom. Reasons for this, in terms of power relations and conventional norms of social behaviour, are not hard to find; but the fact is that teacher-pupil dialogues do not offer much opportunity for pupils

to practise their use of language as a tool for reasoning more generally. A more suitable setting for productive argumentative dialogue, one might expect, would be collaborative activity amongst pupils without a teacher present. However, observational research in classrooms suggests that when pupils are allowed to work together in groups most of their talk is either disputational or blandly and unreflectively co-operative, only involving some of the children and providing no more than a brief and superficial consideration of the relevant topics (Barnes & Todd, 1995; Bennett & Cass, 1989; Wegerif & Scrimshaw, 1997).

Over the last ten or so years, Lyn Dawes, Rupert Wegerif, Karen Littleton and I have been working closely with primary teachers in the UK to develop a practical programme of 'Talk Lessons' for children aged 8-11. The Talk Lessons are designed with a careful balance of teacher-led and group-based activities. Drawing from the research on teacher-pupil communication which I described earlier, we have designed teacher-led whole-class activities to raise children's awareness of how they talk together and how language can be used in joint activity for reasoning and problem-solving. These teacher-led activities are coupled with group-based tasks, in which children have the opportunity to practise ways of talking and collaborating, and these in turn feed into other whole-class sessions, in which teachers and children reflect together on what has been learned. The group tasks include topics directly relevant to the National Curriculum for English, science and citizenship (Cf. Dawes, 1997, 1998 for a teacher's account of these lessons and activities in a curriculum context). We have also created computer-based activities using specially designed software (as described in Wegerif, Mercer & Dawes, 1998; the Talk Lessons and associated software are available as Dawes, Mercer and Wegerif, 2000).

In order to evaluate the Talk Lessons programme, we made comparisons between children in 'target' classes (those using the Talk Lessons) with 'control' classes (of similar children in schools not involved in the programme). One specific kind of comparison we made was to video-record groups of both target and control children doing the same computer-based activities. This comparison reveals striking differences

between the two sets of children. Children who took part in the programme are seen to discuss issues in more depth and for longer, participate more equally and fully, and provide more reasons to support their views. (The findings of this research are reported in detail in Mercer, Wegerif and Dawes, 1999; our methods of analysis are described in Wegerif and Mercer, 1997.) Our analysis of recordings of the group activities shows that the improved ability of the 'target' children to think together critically and constructively can be related directly to the structure and content of their talk.

Our 'target' and 'control' classes were also both given a psychological test, the Raven's Progressive Matrices, which has been commonly used as a general measure of non-verbal reasoning (Raven, Court, & Raven, 1995). As an additional way of assessing any effects of the Talk Lessons on children's problem-solving skills, we gave both sets of children this test before the target children did the Talk Lessons, and then again after the series of lessons had been completed. A group of children in each target class was also video-recorded, before and after the programme, as they tackled the test. In this way we were able to observe, analyse and assess these children's joint problem solving activity. When we compared groups in 'target' classes who had failed on specific problems in the pre-lessons test with their successes in the post-lessons test, we could see from the transcripts of their discussions how the quality of their collective reasoning had enabled them to do so. Here for illustration, are two sequences from the talk of children in the same group. They are doing one of the Raven's puzzles (D9). Sequence 6 was recorded before they did the series of Talk Lessons, while Sequence 7 was recorded after they had done so.

Sequence 6: Graham, Suzie and Tess doing Raven's test item D9 (before the Talk Lessons)

Tess:	It's that
Graham:	It's that, 2
Tess:	2 is there
Graham:	It's 2
Tess:	2 is there Graham

Graham: It's 2  
Tess: 2 is there  
Graham: What number do you want then?  
Tess: It's that because there ain't two of them  
Graham: It's number 2, look one, two  
Tess: I can count, are we all in agree on it?  
[Suzie rings number 2 - an incorrect choice - on the answer sheet]  
Suzie: No  
Graham: Oh, after she's circled it!

Sequence 7: Graham, Suzie and Tess doing Raven's test item D9 (after the Talk Lessons)

Suzie: D9 now, that's a bit complicated it's got to be  
Graham: A line like that, a line like that and it ain't got a line with that  
Tess: It's got to be that one  
Graham: It's going to be that don't you think? Because look all the rest have got a line like that and like that, I think it's going to be that because ...  
Tess: I think it's number 6  
Suzie: No I think it's number 1  
Graham: Wait no, we've got number 6, wait stop, do you agree that it's number 1? Because look that one there is blank, that one there has got them, that one there has to be number 1, because that is the one like that. Yes. Do you agree?  
[Tess nods in agreement]  
Suzie: D9 number 1 [She writes '1', which is the correct answer]

In Sequence 6, we can see that Tess does offer a reason -- a good reason -- for her view, but Graham ignores it and she seems to give up in the face of his stubbornness. Suzie has taken the role of writer and she says little. At the end, having ringed the answer Graham wanted, she disagrees with it. It is not the right answer; but they all move on to

the next problem anyway. Sequence 7 illustrates some ways that the talk of the same children changed after the programme of Talk Lessons and how this helped them to solve the problem. Graham responds to opposition from Tess by giving an elaborated explanation of why he thinks 'number 1' is the correct choice. This clear articulation of reasons leads the group to agree on the right answer. Such explanations involve a series of linked clauses and so lead to longer utterances. All three children are now more equally involved in the discussion. They make more effective rhetorical use of language for expressing their opinions and persuading others of their value. Compared with their earlier attempt, language is being used more effectively by the group as a tool for thinking together about the task they are engaged in.

The quality of the discussion of the children who were most successful in solving the Raven's problems can be related to the concept of 'exploratory talk', a way of using language for reasoning which was first identified by the pioneering British educational researcher Douglas Barnes (e.g. Barnes and Todd, 1995). My own conception of this way of communicating is as follows:

Exploratory talk is that in which partners engage critically but constructively with each other's ideas. Relevant information is offered for joint consideration.

Proposals may be challenged and counter-challenged but, if so, reasons are given and alternatives are offered. Agreement is sought as a basis for joint progress.

Knowledge is made publicly accountable and reasoning is visible in the talk.

There are good reasons for wanting children to use this kind of talk in group activities, because it is a very functional kind of language genre, with speakers following ground rules which help them share knowledge, evaluate evidence and consider options in a reasonable and equitable way. That is, exploratory talk represents a way in which partners involved in problem-solving activity can use language to think collectively -- to 'interthink' effectively, with their activity encapsulated in an intermental zone of their own construction. Other experimental and observational studies have demonstrated the value of talk of this kind in problem solving (Teasley, 1997; Lyle, 1993; see also

Littleton and Light, 1999). As a result of some recent convergence between sociocultural research and systemic functional linguistics, the relationship between the language genres of a community, the organization of social activity and the pursuit of education has become clear (Gibbons, in press, Russell, 1997; Wells, 1999). Exploratory talk is embodied in some important social practices, such as those used in science, law and business, and it is reasonable to expect that education should help every child to become aware of its value and become able to use it effectively.

### **From the Intermental to the Intramental**

The comparisons between the talk of the children in target and control classes, and between the 'before' and 'after' talk of children in the target classes, confirmed that the Talk Lessons were changing the ways language was used as a tool for collective reasoning. In a nutshell, the lessons led to the children using more 'exploratory talk', and the increased use of this kind of talk was associated with improved joint problem solving. But, as I mentioned at the very beginning of this chapter, the results of this research also provide some evidence about Vygotsky's hypothesis about the link between social activity (the 'intermental') and individual development (the 'intramental'). This aspect of the research depended again on the use of the Raven's test. Two versions of this test are available and so, as well as giving one version of the test to groups of children in both target and control classes before and after the Talk Lessons programme had been implemented (with the target classes), we also set each child in the target and control classes the other version of the test as an individual problem-solving activity. We found that target children became significantly better at doing the problems individually, when compared with the control children. That is, the children who had experienced the Talk Lessons appeared to have improved their reasoning capabilities by taking part in the group experience of explicit, rational, collaborative problem-solving. This is despite the fact that these children had no more experience or training in doing the Ravens' puzzles, together or alone, than the children in the control classes.

Of course, we cannot be sure exactly what the target children learned from their experience that made the difference. It may be that some gained from having new,

successful problem-solving strategies explained to them by their partners, while others may have benefited from having to justify and make explicit their own reasons. But a more radical and intriguing possibility is that children may have improved their reasoning skills by 'internalising' the ground rules of exploratory talk, so that they become able to carry on a kind of silent rational dialogue with themselves. That is, the Talk Lessons may have helped them become more able to generate the kind of rational thinking which depends on the explicit, dispassionate consideration of evidence and competing options. That interpretation is consistent with Vygotsky's claims about the link between the social and the individual; collective thinking has a shaping influence on individual cognition.

### **Conclusions**

One of the strengths of bringing a sociocultural perspective to bear on education, I believe, is that it encourages us to recognize that the quality of education cannot be explained in terms of 'learning' or 'teaching' as separate processes, but rather in terms of the interactive process of 'teaching-and-learning'. (The English language offers no elegant way of referring to this process. Interestingly, Vygotsky had at his disposal the Russian word *obuchenie*, which means both teaching and learning.) While the focus of attention of educational research may at any particular time be on the teacher or on the learner, we need to consider the active contributions of both these partners to *obuchenie* in any account of events and their outcomes. I have introduced the notion of an 'intermental development zone' to highlight the way that the success of education can be very dependent on partners creating and maintaining shared knowledge resources and a common frame of reference for their joint activity. For an applied researcher or teacher who is concerned with assessing and improving the quality of education, a sociocultural perspective helps avoid any tendency to attribute problems or solutions to the separate actions of teachers or learners, or to account for events without reference to the historical, cultural and institutional frameworks in which they take place.

In relation to classroom education, a sociocultural perspective may also help us transcend the persistent, unfortunate and unhelpful debate about the relative benefits of

teacher-led, whole-class sessions and activities where learners work together without the teacher in small groups. Group activities offer learners good opportunities to practise and evaluate ways of using language to think collectively, away from the teacher's authoritative presence. But they need first to be guided in how to talk and work together if these activities are to be of most benefit for their learning; and they may later need the intellectual leadership of a teacher to help them consolidate what they have learned from their joint efforts and relate it to the curriculum and other cultural reference frames. Thus in the Talk Lessons programme, teachers organize and lead activities, provide children with information and guidance and help them recognize and reflect on what they have learned. They talk explicitly with children about the goals of classroom activities. Each teacher models 'exploratory' ways of talking for the children in whole-class sessions - for example, asking 'Why?' at appropriate times, giving examples of reasons for opinions, and checking that a range of views is heard. The success of the Talk Lesson programme depends very much, I believe, on its careful balance between teacher-led, whole-class sessions and 'talk groups' in which children work and talk together, without constant teacher supervision, on problem-solving activities. The organized continuity of this experience helps children to consolidate learning, gain educational benefit from their experience - and hopefully helps them understand better how language can be used, in many kinds of social situation, for thinking together and getting things done.

The sociocultural or CHAT perspective on intellectual development asserts that we are essentially social, communicative creatures who gain much of what we know from others and whose thoughts and actions are shaped by our interactions. It also highlights the ways that, through involvement in the taken-for-granted normality of social life, each new generation is influenced by the habits of its predecessors. The role of language as a cultural toolkit for joint intellectual activity is emphasised by this perspective - and so is the relationship between the social and psychological uses of language. All these ideas can be traced back to the original work of Vygotsky. But we need now to go further, following Vygotsky's pioneering example by developing a more radical conception of the relationship between language and thinking. My own suggestion is that we focus our attention directly upon language as a means for thinking collectively - a process which

we might, by analogy with 'interaction', call 'interthinking' (Mercer, 2000). This would involve the study of many other kinds of social interaction, not only those which are in any obvious sense 'educational'. Such studies could help us to bring the intellectual, developmental, pragmatic, social and cultural functions of language within one theoretical framework. We could then, with increasing confidence, apply this framework in educational and other applied fields of research.

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