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CHAPTER 13: THE SIGNIFICANCE OF EDUCATIONAL DIALOGUES BETWEEN PRIMARY SCHOOL CHILDREN

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Introduction

In this chapter we explore the significance of educational dialogues between primary school children. Drawing on our own and others' research we suggest that there is evidence to support the view that, with teachers' guidance, working and talking together can provide a powerful support for children's cognitive development and learning. However, the evidence also shows that much of the talk in collaborative activity in classrooms is unproductive – with children working everywhere in groups but rarely as groups, and with teachers often seemingly unaware of how to maximize the quality of children's collaborative work. Arguing that there is a need to explicitly induct children into ways of talking and working together, we highlight work from our ongoing programme of classroom-based research explicitly designed to enhance the quality of children's talk and joint activity. Most of our research has been with the primary (8-11 years) age group, and so we will draw on examples and evidence accordingly. We show how a well-designed programme of language-based classroom activities can make an important contribution to the development not only of children's language and communication skills, but also to their reasoning and learning.

Sociocultural theory and the significance of interaction

Within educational research, a particular theoretical perspective has become influential over recent decades, from which education and cognitive development are seen as cultural processes. From this sociocultural perspective, knowledge is not considered to be only possessed individually, but also created by and shared amongst members of communities and the ways that knowledge is created are seen to be shaped by cultural and historical factors. This does not mean that sociocultural researchers boldly assert that intellectual achievement is determined entirely by social experience rather than heredity; they recognize that innate factors play an important part in development, but share the view that we cannot understand the nature of thinking, learning and development without taking account of the intrinsically historical, social and communicative nature of human life.

Detailed explanations of the sociocultural approach to education (which is also sometimes called 'cultural-historical') can be found in Wells and Claxton (2002) and Daniels (2001), but to summarize - from this perspective education is seen as a 'dialogic' process, with intellectual development being shaped to a significant extent through interaction. In educational settings it is not only the interactions between students and teachers that are regarded as being of significance and consequence, but also those amongst students. Such interactions inevitably reflect the historical development, cultural values and social practices of the societies and communities in which schools and other educational institutions exist, as well as the more local cultures and practices within particular schools and classrooms. An important implication of this perspective is that we are encouraged to look for the basis of educational success, and failure, in the nature and quality of the social and

communicative processes of education rather than in the intrinsic capability of individual students, the didactic presentational skills of individual teachers, or the quality of the educational methods, materials and technologies that have been used.

From a sociocultural perspective, language is one of the principal tools for constructing knowledge. Vygotsky (1962, 1978), whose work provided the foundations for sociocultural theory, argued that the acquisition and use of language transformed children's thinking. He described language as both a cultural tool (for the development and sharing of knowledge amongst members of a community or society) and as a psychological tool (for structuring the processes and content of individual thought). He also proposed that there is a close relationship between these two kinds of use, which can be summed up in the claim that 'intermental' (social, interactional) activity forges some of the most important 'intramental' (individual, cognitive) capabilities, with children's involvement in joint activities generating new personal understandings and ways of thinking. From a sociocultural perspective, then, language acquisition and use are seen as having a profound effect on the development of thinking (Mercer 2000, 2008; Wells 1999). This gives the study of talk in educational settings a special significance, and implies that its effective use in classrooms is important.

Although ideas have changed to some extent in recent years, pupil-pupil talk is still regarded with unease by many teachers (see for example, Fisher and Larkin 2008). As any teacher will confirm, one way that they feel their competence is judged by senior staff is: can they keep their class quiet? Of course, the reasonable explanation for the traditional discouragement of pupil-pupil talk is that, as an incidental accompaniment

to whole class chalk-and-talk teaching, it is indeed disruptive and subversive. Even in less formal regimes, teachers have an understandable concern with limiting the amount of 'off-task' talk that goes on. Thus whilst working and learning with other people is quite common in everyday life outside school, educational practice has implicitly argued against it and collaborative activity amongst children has rarely been incorporated into the mainstream of classroom life. One of the motivations for our research has been to change this situation.

Learning as a collaborative enterprise

In everyday life, the term 'collaboration' and 'cooperation' are often used in very loose and general ways to indicate that people are working together to get something done. In the research literature, however, there has been considerable debate about how to define terms such as collaboration and collaborative learning (for example, Dillenbourg 1999). Nevertheless, it is usually agreed that collaboration means something more than children working together in a tolerant and compatible manner. 'Collaborating' or being engaged in collaborative learning means that participants are engaged in a coordinated, continuing attempt to solve a problem or in some other way construct common knowledge. It involves a coordinated joint commitment to a shared goal, reciprocity, mutuality and the continual (re)negotiation of meaning (as described by Barron 2000; Nystrand 1986). Participants in collaboration may experience what Ryder and Campell (1989) call 'groupsense' or a feeling of shared endeavour. Such coordinated activity depends upon the collaborators establishing and maintaining what Rogoff (1990) and Wertsch (1991) have termed *intersubjectivity*. It will necessarily involve them maintaining a shared conception of the task or problem. Partners will

not only be interacting, as they might in cooperative activity, but also *interthinking* (Mercer 2000).

There has been a great deal of research interest in children's collaborative working, learning and problem-solving, though much of the research has not been carried out in school. The issue has been researched in diverse ways - for example, through large scale surveys of life in classrooms; experiments in which pairs or groups of children work on specially designed problem-solving tasks; and detailed analyses of talk between pairs or groups of children working on curriculum-based tasks in school. We will now consider each of these in turn.

Perhaps one of the first messages to emerge from work *surveying* classroom activity is that, at least in British primary schools, truly collaborative activity rarely happens. This was the alarming conclusion of a large scale research project carried out in the 1970s called ORACLE (Galton, Simon and Croll 1980). The ORACLE team of researchers, observing everyday practice in a large number of British primary schools, found that just because several children were sitting together at a table (as was common) did not mean that they were collaborating. Typically, children at any table would simply be working, in parallel, on individual tasks. While they might well have talked as they worked, and while they might possibly have talked to each other about their work, the activities they engaged in did not encourage or require them to talk and work together. This problem of children working *in* groups but rarely *as* groups has also been underscored in a number of more recent studies, some of which have shown that even when children are set joint tasks their interactions are rarely productive (Galton, Hargreaves, Comber, Wall and Pell 1999; Blatchford and Kutnick 2003;

Alexander 2005). This tells us something important about the nature of everyday educational practice and leads to the conclusion that much everyday classroom-based talk amongst children may be of limited educational value.

Much of the early collaborative learning research consisted of *experimental studies* of peer interaction which were designed to establish whether working and solving problems collaboratively was more effective than working alone. Typically, children would be given the same task, but allocated either to working collaboratively or working alone, and their performance on the task assessed. Reviewing such studies, Slavin (1980) noted that collaborative learning was often judged to increase students' academic achievement, self esteem and motivation. These sorts of investigations gave rise to research in which independent variables, such as group size (e.g. Fuchs and Fuchs 2000), group composition, (e.g. Barbieri and Light 1999; Howe 1997; Webb 1989) and nature of the task (e.g. Cohen 1994; Light and Littleton 1999; Underwood and Underwood, 1999) were manipulated and the effects assessed. (See Wilkinson and Fung 2002 for a review of work in this field.) However, because such variables interact with each other in complex ways, it has been virtually impossible to isolate the conditions for effective collaboration. Researchers thus started to focus less on establishing parameters for effective collaboration and more on ways in which factors such as task design or group composition influence the processes of collaborative interaction (Dillenbourg, Baker, Blaye and O'Malley 1995; Littleton 1999).

Some experimental studies of collaborative interaction, have focused on how children talk together when they are working on a problem or task. They have handled the data of recorded talk by reducing it to pre-defined coded categories which in turn lend

themselves to treatment by statistical analyses. In particular, correlational techniques have been used to establish whether there is an association between features of learners' talk and on-task success or subsequent learning gain. For example, Azmitia and Montgomery (1993) found that the quality of children's dialogue is a significant predictor of their successful problem-solving. Studying children engaged in joint computer-based problem-solving tasks, Barbieri and Light (1992) found that the amount of talk about planning, negotiation and the co-construction of knowledge by partners correlated significantly with successful problem solving by pairs, and to successful learning outcomes in subsequent related tasks by individuals. Similar analytic techniques used by Underwood and Underwood (1999) demonstrated that for pairs of children working on a computer-based problem-solving activity, those who were most observed to offer opinions, analyse the situation in words and express agreement and understanding achieved the best outcomes.

Regarding effects on individuals, a series of experimental, and observational, studies by Howe and colleagues (see this volume) have shown that conceptual understanding in science is enhanced by children's discussion of ideas during group work. They found that some features of dialogue are particularly associated with solving complex problems, such as requiring that partners should try to achieve consensus in their discussion (Howe and Tolmie 2003). Reviewing their own and other research (mainly school-based), they conclude that the most productive interaction seems to involve pupils proposing ideas and explaining their reasoning to each other (Howe, Tolmie, Thurston, Topping, Christie, Livingstone, Jessiman and Donaldson 2007). Moreover, the expression of contrasting opinions during group work was the single most important predictor of learning gain. They also found that the positive effects of group work are often delayed (Howe, Tolmie, and

Rodgers 1992) and this seems to be because dialogue primes children to make good use of subsequent experiences (Howe, McWilliam, and Cross 2005). Howe et al. (2007) also found that group work seemed most productive when teachers did not intervene, but left pupils to work through problems without intervention - Barnes and Todd also draw attention to how teachers can inadvertently undermine group collaboration, a point further underscored by Hertz-Lazarowitz (1992).

Overall, then, the *experimental* evidence supports the view that focused, sustained discussion amongst children not only helps them solve problems but promotes the learning of the individuals involved. This conclusion may seem like common sense: but if it is so obviously true, one is led back to the question of why high quality peer discussion has not been directly promoted and facilitated in formal education.

In the 1970's Barnes and Todd undertook one of the most important early *studies of children's talk while working together in school*, carried. It involved secondary-age children (Barnes and Todd 1977, see also 1995 and Barnes 2008), but the insights that research provided have informed much other research since, including that focused on the primary years. Barnes and Todd suggested that pupils are more likely to engage in open, extended discussion and argument when they are talking with their peers outside the visible control of their teacher and that this kind of talk enabled them to take a more active and independent ownership of knowledge:

‘Our point is that to place the responsibility in the learners’ hands changes the nature of that learning by requiring them to negotiate their own criteria of relevance and truth. If schooling is to prepare young people for responsible

adult life, such learning has an important place in the repertoire of social relationships which teachers have at their disposal.’ (127)

Based on their detailed observations, Barnes and Todd suggest that classroom discussion has to meet certain requirements for explicitness which would not normally be required in everyday conversation. One of their key ideas was the concept of Exploratory Talk, in which a speaker articulates half-formed thoughts so that they can be tested out in the telling, and so that others can hear them, and comment. In that kind of talk, knowledge is made publicly accountable, relevant information is shared effectively, opinions are clearly explained and explanations examined critically. They also argued that the successful pursuit of educational activity depends on learners (a) sharing the same ideas about what is relevant to the discussion and (b) having a joint conception of what is trying to be achieved by it. These points have been supported by other research based in primary schools (e.g. Bennett and Dunne 1992; Galton and Williamson 1992; Mercer and Littleton 2007).

The significance of exploratory talk

In the Spoken Language and New Technology (SLANT) project in the early 1990s researchers observed the talk of children’s aged 8-11 years when they worked together in small groups at the computer in classroom settings (as described in Wegerif and Scrimshaw 1997). Classroom talk was recorded in ten primary school classrooms across five counties in the south east of England. Detailed analysis of the children’s joint sessions of work suggested that most of the interactions recorded were not task-focused, productive or equitable. In some pairs or groups one child so completely dominated the discussion that the other group members either withdrew

from the activity, becoming increasingly quiet and subdued, or else they participated marginally, for example, as the passive scribe of a dominant child's ideas. In other groups the children seemed to ignore each other, taking turns at the computer, each pursuing their own particular ideas when 'their turn' came round. Some groups' talk involved them in unproductive, often highly competitive, disagreements. From time to time these disagreements escalated, with the children becoming increasingly irritated with each other and engaging in vehement personal criticism. On the other hand, much group talk was relatively brief, somewhat cursory and bland. Particularly when groups of friends worked together, the discussions were uncritical, involving only superficial consideration and acceptance of each other's ideas. These observations resonated with those of the other research projects, detailed earlier, that indicated that although grouping children was a common organisational strategy, talk of any educational value was rarely to be heard. That said, very occasionally there was evidence of a distinctive kind of interaction that was qualitatively different and more educationally productive. Here the children engaged in discussions in which they shared relevant ideas and helped each other to understand problems. They were mutually supportive and were constructively critical of each others' ideas, with challenges and counterchallenges being justified and alternative ideas and hypotheses being offered. There was more of the kind of interaction which Barnes and Todd (op.cit.) called Exploratory Talk.

On the basis of the analysis of the SLANT data, the researchers devised a three part typology of talk, designed to characterize the different ways in which children in the project classrooms talked together (Fisher 1993; Mercer 1995). In this typology, the concept of Exploratory talk differs from the original usage by Barnes and Todd by

being less focused on individuals sorting out their thoughts and more on collaborating partners thinking together – what we would term ‘interthinking’ (Mercer 2000).

- *Disputational Talk*, which is characterized by disagreement and individualized decision making. There are few attempts to pool resources, to offer constructive criticism or make suggestions. Disputational talk also has some characteristic discourse features – short exchanges consisting of assertions and challenges or counter assertions (‘Yes, it is.’ ‘No it’s not!’).
- *Cumulative Talk*, in which speakers build positively but uncritically on what the others have said. Partners use talk to construct ‘common knowledge’ by accumulation. Cumulative discourse is characterized by repetitions, confirmations and elaborations.
- *Exploratory Talk*, in which partners engage critically but constructively with each other’s ideas. Statements and suggestions are offered for joint consideration. These may be challenged and counter-challenged, but challenges are justified and alternative hypotheses are offered. Partners all actively participate, and opinions are sought and considered before decisions are jointly made. Compared with the other two types, in Exploratory Talk knowledge is made more publicly accountable and reasoning is more visible in the talk.

(Mercer and Littleton 2007: 58-59.)

The reader might like to test the application of the typology by considering each of the following short examples of discussions, Sequences 1-3 below (to which we will also provide a commentary). In all three of the transcripts below, the participants are primary school children who are working at the computer. They are all engaged in the joint task of making up a conversation between two cartoon characters portrayed on a computer screen, and also have to decide what the characters are thinking as they speak. They then type the words into the relevant 'speech' and 'thought' bubbles. (Whenever it seemed to the researchers that the children were speaking the voices of the characters, the words have been placed in inverted commas.)

Sequence 1: Jo and Carol

- Carol: Just write in the next letter. "Did you have a nice English lesson."
- Jo: You've got to get it on there. Yes that's you. Let's just have a look at that.
"Hi, Alan did you have a nice English lesson. Yes thank you, Yeah. Yes thank you it was fine."
- Carol: You've got to let me get some in sometimes.
- Jo: You're typing.
- Carol: Well you can do some, go on.
- Jo: "Yes thank you."
- Carol: [*unintelligible.*]
- Jo: You're typing. "Yes thank you" "I did, yeah, yes, thank you I did."
- Carol: You can spell that.
- Jo: Why don't *you* do it?
- Carol: No, because *you* should.

Sequence 2: Sally and Emma

Sally: Yeah. What if she says erm erm “All right, yeah.” No, just put ‘Yeah all right.’ No, no.

Emma: No. “Well I suppose I could.”

Sally: “spare 15p.” Yeah?

Emma: Yeah.

Sally: “I suppose.”

Emma: “I suppose I could spare 50p.”

Sally: “50?”

Emma: Yeah. “Spare 50 pence.”

Sally: “50 pence.”

Emma: “50 pence.” And Angela says “That isn’t enough I want to buy something else.”

Sally: Yeah, no no. “I want a drink as well you know I want some coke as well”.

Emma: “That isn’t enough for bubble gum and some coke.”

Sally: Yeah, yeah.

Sequence 3: Tina, George and Sophie

George: We’ve got to decide.

Tina: We've got to decide together.

George: Shall we right, right, just go round like [take

Tina: [No, go round. You say what you think,
and she says.

George: I think she should be saying 'Did you steal my money from me?'

Tina: Your go

Sophie: I think we should put 'I thought that my money's gone missing and I thought it was you'

George: 'I think it was you'.

Sophie: Which one?

Tina: Now what was it I was going to say, Um, um.

George: No because she's *thinking*, so we need to do a thought. So we could write her saying.

Sophie: 'My money's gone [missing so].

Tina: [I was going to say if we're doing the one where she's saying, this is *saying* not thinking.

Sophie: 'My money's gone do you know where it is?'

Tina: No, [on the saying one she could say

George [You should be saying.

Tina: Like she could be thinking to say to Robert, she could be saying 'Do you know where's my money?' 'Do you know anything about my money going missing?'

George: Yeah, what, yeah that's good. When she's thinking I think she should be thinking 'Oh my money's gone missing and its definitely Robert.'

Tina: Yeah.

Sophie: No 'cos she's *saying* it to him isn't she?

Tina: [No she's *thinking* at the moment.

George: [No she's *thinking*.

Tina: *That's* the speech bubble.

The talk in Sequence 1 has characteristics of Disputational Talk. Both participants take an active part, but there is little evidence of joint, collaborative engagement with

the task. Much of the interaction consists of commands and assertions. The episode ends with a direct question and answer, but even this exchange has an unproductive, disputational quality. Sequence 2 has obvious features of Cumulative Talk. There is no dispute, and both participants contribute ideas which are accepted. We can see repetitions, confirmation and elaborations. The interaction is cooperative, but there is no critical consideration of ideas. Sequence 3 has some characteristics of Exploratory Talk. It begins with Tina and George making explicit reference to their task as requiring joint decision making, and they attempt to organize the interaction so that everyone's ideas are heard. They then pursue a discussion of what is appropriate content for the character's 'thought' and 'speech' bubbles in which differing opinions are offered and visibly supported by some reasoning (For example 'No, because she's *thinking*, so we need to do a thought.' '...if we're doing the one where she's saying, this is *saying* not thinking.'). However, their reasoning is focused only on this procedural issue: they do not discuss explicitly or critically the proposed content of the character's thoughts and words. Were the space available to include longer examples, we could show that their later discussion also has some 'cumulative' features.

It is important to emphasize that the three-part typology described and exemplified above is not only meant to be descriptive: it has an evaluative dimension, reflecting a concern with educational effectiveness. Talk of a mainly 'disputational' type, for example, was very rarely associated with processes of joint reasoning and knowledge construction. Whilst there may be a lot of interaction between children, the reasoning involved was mainly individualized and tacit. Furthermore, the kind of communicative relationship developed through disputation was defensive and overtly

competitive, with information and ideas being flaunted or withheld rather than shared. It was common for this type of talk to comprise tit-for-tat 'yes it is', 'no it isn't' patterns of assertion and counter-assertion. Disputational argument of this kind has little in common with the kind of reasoned argument that is represented by Exploratory Talk. Children engaged in a disputational type of talk are not, however, orientated to the pursuit of reasoned argument, they are being 'argumentative' in the negative sense of squabbling and bickering.

In contrast to Disputational Talk, Cumulative Talk characterizes dialogue in which ideas and information are shared and joint decisions are made: but there is little in the way of challenge or the constructive conflict of ideas in the process of constructing knowledge. Cumulative Talk represents talk which seems to operate more on implicit concerns with solidarity and trust, hence the recourse to a constant repetition and confirmation of partners' ideas and proposals.

Exploratory Talk represents a joint, co-ordinated form of co-reasoning in language, with speakers sharing knowledge, challenging ideas, evaluating evidence and considering options in a reasoned and equitable way. The children present their ideas as clearly and as explicitly as necessary for them to become shared and jointly analysed and evaluated. Possible explanations are compared and joint decisions reached. By incorporating both constructive conflict and the open sharing of ideas, Exploratory Talk constitutes the more visible pursuit of rational consensus through conversation. Exploratory Talk foregrounds reasoning. Its ground rules require that the views of all participants are sought and considered, that proposals are explicitly stated and evaluated, and that explicit agreement precedes decisions and actions. It is

aimed at the achievement of consensus. Exploratory Talk, by incorporating both conflicting perspectives and the open sharing of ideas, represents the more visible pursuit of rational consensus through conversations. It is a speech situation in which everyone is free to express their views and in which the most reasonable views gain acceptance.

The purpose of this three part analytic typology is quite circumscribed: to focus attention on the extent that talk partners use language to think together when pursuing joint problem-solving and other learning activities. It is not designed to deal with many other important ways that the forms of talk reflect a variety of purposes used, such as the maintenance of social identities, expression of power and solidarity, emotional ties amongst speakers and so on (as studied extensively by sociolinguists, social psychologists and other researchers). The three types of talk were not devised to be used as the basis for a coding scheme (of the kind used in systematic observation research). Rather, the typology offers a way of exploring the functional variation of talk as a means for pursuing collaborative activity. In an initial consideration of the data, it helps an analyst perceive the extent to which participants in a joint activity are at any stage behaving collaboratively or competitively and whether they are engaging in critical reflection or in the mutual acceptance of ideas. It has also proved useful for helping teachers and others involved in educational practice gain insights into the functional variety of children's talk. Other educational researchers have independently come up with very similar characterisations of intellectually stimulating, collaborative and productive classroom talk - though usually with secondary school students. In the USA, Anderson and colleagues (Anderson, Chinn, Waggoner and Nguyen 1998; Chinn and Anderson, 1998) have identified the kind of talk they call *Collaborative*

Reasoning (CR). On the basis of data they obtained through their own interventional studies, they say that during CR discussions, the quality of children's reasoning is high and they display higher levels of thinking than in usual classroom discussions. 'In the course of CR discussions, children actively collaborate on the construction of arguments in complex networks of reasons and supporting evidence' (Kim, Anderson, Nguyen-Jahiel and Archodidou 2008). It should be noted, however, that the source of such talk in their studies was *teacher-led* discussion with groups of children. There are also strong links between the concept of Exploratory Talk (as we have defined it) and what some educational researchers have called 'accountable talk' (Resnick 1999; Michaels and O'Connor 2002).

Drawing on their own extended work, as well as that of several other cognitive scientists, philosophers and discourse analysts, Keefer, Zeitz and Resnick (2000) also tried to identify the characteristics of the most productive classroom discussion when the subject matter is literature. They define a set of four types of informal dialogue which we summarize as follows:

- (1) *Critical discussion*, which has the main goal of achieving shared understanding through accommodating divergent viewpoints and reconciling differences of opinion;
- (2) *Explanatory enquiry*, which starts from a position of lack of knowledge with the main goal of overcoming and identifying correct knowledge, using cumulative discursive steps;
- (3) *Eristic discussion*, in which initial conflict and antagonism amongst participants is acted out through rhetorical attacks and defenses of

participants' own positions, and which may achieve some 'provisional accommodation'; and

- (4) *Consensus dialogue*, which is discussion amongst speakers whose opinions are in agreement.

There are some obvious connections between 'eristic discussion' and Disputational Talk; 'consensus dialogue' and Cumulative Talk. It would seem that Exploratory Talk subsumes characteristics of both 'critical discussion' and 'explanatory enquiry', though given the emphasis we have placed on group members achieving some kind of agreed conclusion to their joint enquiry, it is perhaps closer to the latter. We can also see that in their reference to 'discursive norms' in the quotation above, Keefer et al. are essentially invoking what we have called 'ground rules'. In relation to the particular curriculum focus of their research, they argue that 'critical discussion is the most appropriate dialogue type for a discussion focused on literary content' (2000: 58) and so they go on to use that dialogue type as a model for an evaluation of the discussions of groups of children, aged around nine years old, in a school in the USA as they were talking about. Their evaluative analysis was based on the view that...

'...a productive discussion...should include some progress in the participants' understanding of the original question or issue being debated (e.g., participants ought to show greater interest in the development of ideas and issues than they do in the presentation and defense of their own positions). Furthermore, we believe that participants in discussions having these qualities might be more prepared to change their views—in other words, to seriously listen to (and

even construct) arguments that run counter to views that they might initially hold.’ (2000: 60)

We can see more clearly here some strong similarities between this notion of a ‘critical discussion’ and Exploratory Talk. Keefer et al.’s analysis also examined the extent to which the relevant literary content was directly invoked and discussed by the groups. They concluded that the most productive groups were those in which the talk included a high proportion of literary content and in which the talk most resembled ‘critical discussion’. They conclude by commenting on ‘the challenge of helping teachers to lead discussions that are appropriate to the content and goals of the dialogue, scaffolding children to reason within the constraints of the dialogue rules and to initiate shifts in context when the content or the course of argumentation might warrant it.’ (2000: 79).

From our consideration of the research above, we can conclude that evidence supports the view that working and talking together can provide a powerful support for children’s learning. However, the evidence also shows that much of the talk in collaborative activity in classrooms is ‘disputational’ or ‘cumulative’ rather than ‘exploratory’. One reason may be that many children do not have much experience or skill in generating talk of an ‘exploratory’ kind. It has been found that the amount and quality of talk between parents and young children at home varies considerably (for example, Wells 1986: Hart and Risley 1995): in some homes, rational debates, logical deductions, extended narrative accounts and detailed explanations may seldom be heard. Without guidance, instruction and encouragement from a teacher, many children may not gain access to some very useful ways of using language for

reasoning and working collaboratively, because those ‘ways with words’ are simply not a common feature of the language of their out-of-school communities.

It also seems that teachers may not be aware of children’s lack of understanding and skill in using talk for learning; or at least, they assume that children will know exactly what to do when a teacher asks them to ‘discuss’ a topic, or ‘talk and work together’ to carry out a talk or solve a problem. Children are left to somehow work out what is required and what constitutes a good, effective discussion, but they rarely succeed in doing so. Throughout the primary years, children are able to use language effectively as a tool for thinking together, but many may not know how to, or at the least do not recognize that is what is expected of them.

As demonstrated some years ago now (Edwards and Mercer 1987), the norms or ground rules for generating particular functional ways of using language in primary school - spoken or written - are rarely made explicit. It is often simply assumed that children will pick these sorts of things up as they go along. But while picking up the ground rules and ‘fitting’ in a superficial way with the norms of classroom life may be relatively easy, this may conceal children’s lack of understanding about what they are expected to do in educational activities and why they should do so. The distinction between structures for classroom management (for example, lining up in pairs or sitting rather than kneeling on chairs) and structures which support learning (for example, listening to a partner or asking a question) may not be apparent to children. Even when the aim of talk is made explicit ‘Talk together to decide’; ‘Discuss this in your groups’ - there may be no real understanding of how to talk together or for what purpose. Many children may not appreciate the significance and educational

importance of their talk with one another. They frequently assume that the implicit ground rules in play in the classroom are such that teachers want 'right answers', rather than discussion.

Back in the 1980s, researchers such as Wells (1986) commented that the normative environment for talk in most primary classrooms was not compatible with children's active and extended engagement in using language to construct knowledge. This characterisation of the classroom environment for talk is also one that emerges from more recent work by Alexander (2005: 10) which has indicated that, classroom discourse is 'overwhelmingly monologic' in form, as the orchestrators of classroom discourse, teachers typically only offer children opportunities for making brief responses to their questions:

'...if we are not careful, classrooms may be places where teachers rather than children do most of the talking; where supposedly open questions are really closed; where instead of thinking through a problem children devote their energies to trying to spot the correct answer, where supposed equality of discussion is subverted by ... the 'unequal communicative rights' of a kind of talk which remains stubbornly unlike the kind of talk that takes place anywhere else. Clearly if classroom talk is to make a meaningful contribution to children's learning and understanding it must move beyond the acting out of such cognitively restricting rituals.' (2005: 9)

Interventional studies on talk and collaborative activity in primary schools

In recent years we have, together with colleagues, undertaken a series of classroom-based research projects explicitly designed to improve the quality of children's collaborative activity. More specifically, we have worked closely with teachers to try to increase the use of Exploratory Talk by children in their classroom activities, and then to evaluate the effects on the quality of children's talk, problem-solving, reasoning and learning. Children aged between 6 and 13 years have been involved, but we will here concentrate on the research with the age group 8-11, which has been the most substantial. This was pursued by designing a programme of planned intervention focused on the use of talk which integrated teacher-led whole class dialogue and group activity. Its main aim was to ensure that children would enter collaborative activities with a shared conception of how they could talk and think together effectively.

The programme consisted of a set of twelve 'Thinking Together' lessons created by researchers working with teachers (as included in Dawes, Mercer and Wegerif 2003; Dawes and Sams 2004; Dawes 2008). The programme was then, in collaboration with teachers, implemented with children aged 8-11 years in primary schools, and evaluated using a quasi-experimental method in which children in the experimental or 'target' schools (those who followed the programme) were matched with children of the same age in other local 'control' schools with similar catchments (who pursued their normal curriculum activities). This method permitted a systematic evaluation of the programme while ensuring that the normal contextual factors of school life were still in play.

At the start of the intervention, each participating teacher received a basic training in the approach and was introduced to the Thinking Together lessons. The first five core lessons provided teachers with activities for collectively negotiating and establishing with their classes a set of 'ground rules' which embody the essential qualities of Exploratory Talk (serving to open up a up and maintain an 'intersubjective space' in which alternative solutions to problems are generated and allowed to develop and compete as ideas without threatening either group solidarity or individual identity). That is, these lessons were mainly aimed to develop children's understanding and use of Exploratory Talk. The complete programme included lessons which related to specific curriculum subjects and consists of both teacher-led sessions and group activities (some of which use specially designed computer based tasks based on curriculum topics). In order to evaluate changes in the quality of children's talk, we video-recorded groups of children carrying out activities. This was done in both the target classes and in the control classes.

As mentioned above, the research was designed to test the effects that the intervention had on children's ways of talking, on their curriculum learning and on their individual reasoning skills. To assess effects on reasoning, the *Raven's Progressive Matrices* was used. This is a test which has been commonly used as a general measure of non-verbal reasoning (Raven, Court, and Raven 1995). Both target and control sets of children were given this test before the target classes began the experimental programme, and then again after the series of lessons had been completed. Using two sets of the Raven's test items, we were able to assess the children's thinking both collectively (as they did the test in groups) and individually (when they did the other version of the test alone). This research (described in Wegerif, Mercer and Dawes

1999; Mercer, Dawes, Wegerif and Sams 2004; Wegerif and Dawes 2004; Mercer and Littleton 2007) has produced three main findings. First, a qualitative and quantitative analysis of the children's talk showed that children in target classes came to use significantly more Exploratory Talk than those in control classes. Secondly, by examining the recorded talk of the groups in conjunction with their scores on the Raven's test, we found that groups who used more Exploratory Talk tended to solve the Raven's problems more successfully. Thus 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 how the 'visible reasoning' of exploratory talk in the transcripts had enabled them to do so. We will discuss the third finding shortly. But first, to illustrate our first two findings, are two sequences from the talk of children (aged 10 and 11) in the same target group. They are doing one of the Raven's problems, which requires them to choose which of a numbered set of shapes will logically complete a series of such shapes (hence the children's remarks 'It's 2' and so on). Sequence 4 was recorded before they did the series of lessons, while Sequence 5 was recorded after they had done so.

Sequence 4: Graham, Suzie and Tess doing Raven's test item D9 (before the Thinking Together 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 5: Graham, Suzie and Tess doing Raven's test item D9 (after the Thinking Together 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

(Suzie writes '1', which is the correct answer)

In Sequence 4, the talk is not 'exploratory' but more aptly described as 'disputational'. Cycles of assertion and counter assertion, forming sequences of short utterances which rarely include explicit reasoning, are typical of disputational talk. 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 5 illustrates some of the ways that the talk of the same children changed after doing the programme of Thinking Together lessons and how this helped them to solve the problem. The children's language clearly shows characteristics of Exploratory Talk. 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 third main finding was that the before-and-after comparisons of children's *collective* performance on the Raven's test confirmed that the Thinking Together lessons were changing the quality of children's joint reasoning. But the results also showed that the target children improved their *individual* Raven's scores much more than the control children. It seemed, therefore, that the target children had not only learned more effective strategies for using language to think collectively (and so become better at collaborative working), but also as a result of taking part in the group experience of explicit, rational, collaborative problem-solving had improved their *individual* reasoning capabilities. (It should be noted that the target children had no more or less experience or training in doing the Ravens' test, together or alone, than the control children.). However, it is not clear 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 or appropriating 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 Thinking Together 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 the claims of Vygotsky (1978, as discussed earlier) about the link between social activity and the development of children's thinking. Such compelling

evidence in respect of improved reasoning skills and educational attainment also negates the claims made by some researchers (e.g. Lambirth 2006) that the 'ground rules' associated with Exploratory Talk have no intrinsic value as a basis for collaborative activity.

Summary

Evidence has shown that, under certain conditions, interaction with peers helps children's learning and development. They can develop important communicative skills through interaction, which again they would not learn through only taking part in conversations with adults. But, paradoxically, observational studies have shown that collaboration in classrooms is often unproductive and inequitable. Some studies have suggested that the quality of collaboration can be improved if attention is given to developing an atmosphere of trust and mutual respect (see also Kutnick and Colwell, this volume). Others have shown that the quality of interaction is significantly improved if children are (a) helped to become more aware of how they use language as a tool for thinking together and (b) taught some specific strategies for carrying on 'exploratory', productive discussions. That is, it seems that although collaborative interactions and discussions are potentially very valuable for children's learning and development, that potential may only be realized if children are given structured guidance by their teachers on how to make the most of the opportunities that classroom activities offer.

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