Dialogue and the Development of Children's Thinking

A sociocultural approach

Neil Mercer and Karen Littleton

Dialogue and the Development of Children's Thinking

Even casual observations of children's everyday lives reveal that they are constantly engaged in talk and other forms of social interaction. *Dialogue and the Development of Children's Thinking* provides a clear, accessible and well-illustrated case for the importance of spoken dialogue for children's intellectual development during the school years.

The book draws on extensive research to provide a ground-breaking new account of this relationship, and closely relates the research findings to real-life classrooms, so that it is of practical value to teachers and parents concerned that their children are offered the best possible learning opportunities. Importantly, the book provides compelling evidence from original research to show that the quality of classroom talk improves the quality of children's thinking and educational attainment. The book also provides a new and more educationally relevant interpretation of sociocultural theory, based on the work of Vygotsky, which explains the fascinating relationship between engagement in dialogues and learning.

By using evidence of how the collective construction of knowledge is achieved, and how engagement in dialogues shapes children's educational progress and intellectual development, the authors provide a text that will be essential for educational researchers, postgraduate students of education and teachers, and also be of interest to many psychologists and applied linguists.

Neil Mercer is Professor of Education at the University of Cambridge, UK.

Karen Littleton is Professor of Psychology in Education at The Open University, UK.

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This book is dedicated to the memory of Pam Burns

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Preface

In any area of research, ideas develop through collective as well as individual efforts. This book is the embodiment of the 'interthinking' and collaborative work of a team of researchers, teachers and advisers who have, over 16 or so years, been committed to finding theoretically informed ways of helping children to think together. The ideas presented here have been collectively constructed by the *Thinking Together* team. The other principal members of this team have been Lyn Dawes and Rupert Wegerif, but important contributions to *Thinking Together* have also been made by Juan Manuel Fernández Cardenas, Jan English, Eunice Fisher, Jonathan Giles, Steve Higgins, Ruth Holmwood, Jenny Houssart, Judith Kleine Staarman, Tara Lovelock, Frank Monaghan, Sylvia Rojas-Drummond, Denise Rowe and Claire Sams. Pam Burns provided excellent secretarial support for the research. Many other people have also been important in shaping what we have written here, and of these we would particularly like to acknowledge the influence of Robin Alexander, Jaume Ametller, Douglas Barnes, Caroline Coffin, Mariette de Haan, Derek Edwards, Ed Elbers, Futoshi Hiruma, Paul Light, Janet Maybin, Dorothy Miell, Andy Northedge, Ingvill Rasmussen, Roger Säljo, Phil Scott, Joan Swann and Stephanie Taylor. Without the expert help of Joan Dearman and Carol Johns-Mackenzie, producing the text of this book would have been much more difficult, and excellent editorial support at Routledge has ensured that the process of publication ran smoothly. Thanks are particularly due to Lyn Dawes and Judith Kleine Staarman, who provided constructively critical comments on drafts of the manuscript, and to David Shaw, who proof-read the final version.

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In writing this book we have drawn on our body of previously published research and teaching materials. Some of the material in Chapter 7 is also included in an article by Neil Mercer entitled, The seeds of time: Why classroom dialogue needs a temporal analysis', in the *Journal of Learning Sciences,* volume 16.

Figure 2.1 is reprinted with permission from Taylor and Francis. This figure originally appeared in D.Faulkner, K.Littleton and M.Woodhead (1998) *Learning Relationships in the Classroom,* London: Routledge.

Figure 4.1 is reproduced with the kind permission of Phil Scott.

Appendix A is reprinted with permission from Taylor and Francis. The material originally appeared in L.Dawes and C.Sams (2004) *Talk Box: Speaking and Listening Activities for Learning at Key Stage 1,* London: David Fulton.

Notes on transcription

We have used a very simple transcription format, in which speech is rendered as grammatical phrases and sentences, to represent the sense that we, as researchers with access to the raw data, made of what was said. Information about equipment, non-verbal aspects of communication and any other contextual information that we considered pertinent to the analysis is to be found in italics in a third column or in parentheses. Our judgement was that the inclusion of additional information at our disposal, such as length of pauses or other prosodic and contextual details, would be distracting to readers and irrelevant to the issues we are addressing. Non-word utterances such as 'mm'/'ooh' are included when they are judged to have a communicative function (for example to show surprise, agreement, or to extend a speaker's turn in the face of possible interruptions). Words spoken emphatically are in italics. Simultaneous speech is shown by the use of brackets ([) preceding each utterance. Where the accurate transcription of a word is in doubt, it is in parentheses. When utterances could not be heard or deciphered, we say so.

Chapter 1
Why dialogue?

Our main aim in this book is to explain how classroom dialogue contributes to children's intellectual development and their educational attainment. To do so, we will make use of the results of research we and our colleagues have carried out in schools over the last 16 or so years, as well as the work of many other researchers. Examples drawn from interactions in classrooms will illustrate our discussion of how children develop as thinkers, problem-solvers and effective members of collective endeavours, and of how teachers contribute to that development. But we will do more than make a case for the importance of dialogue as the prime tool for helping children achieve an education from their school experience. We will also describe how talk in classrooms can be analysed in terms of its functions and quality, making clear the implications of this analysis for the practice of teaching and learning. What is now known about the psychological functions of dialogue is not only relevant to the academic study of cognitive development and learning: it is also of practical value to people such as teachers and parents who are concerned with ensuring that children are offered the best educational opportunities. Our hope is that what we have written here will inform practical action.

What kinds of dialogue are we interested in?

'Dialogue' is sometimes used in a broad sense to mean the interchange of ideas between one source and another. It is used to refer to such different processes as an individual reader grappling with the ideas in a book and negotiations between social groups or organizations. Such abstract or metaphorical uses are not wrong or without value, but here we mean something more concrete and specific. In this book, the kind of dialogue we are interested in is classroom talk. To narrow the focus even more, we will concentrate on talk that takes place in the course of educational activities. Though we recognize the importance in educational activity of reading and writing, the use of gesture, diagrams and other non-verbal ways of interacting, our view is that the distinctive role of spoken language in learning and development justifies it being given attention in its own right. Moreover, although there has been a good deal of research on classroom talk, we do not think that enough attention has been given to the relationship between the quality of talk and learning outcomes. The dialogues we will consider include teacher-student exchanges and discussions amongst students. Both those types of dialogue have potential value for learning and development, but we will show that each has special functions.

Why does classroom dialogue deserve more attention?

There are many ways that people can make sense of the world together, using actions, graphic representations and various kinds of symbol systems as well as language. All of these will probably influence the ways individuals come to make sense of the world on their own. We would never claim that everything that can be thought can be thought in language, or that language is involved in all rational thinking. But language is without doubt the most ubiquitous, flexible and creative of the meaning-making tools available, and it is the one most intimately connected to the creation and pursuit of reasoned argument. Becoming an educated person necessarily involves learning some special ways of using language: and language is also a teacher's main pedagogic tool. For these reasons language, and especially spoken dialogue, deserves some special attention.

Understanding the role of spoken dialogue in learning and development must involve consideration of children as social actors, and not just as developing individuals. Social experience does not provide all children with the same language experiences, so we cannot assume that all children naturally have access to the same opportunities for developing their use of language as a tool for learning, reasoning and solving problems. This is nothing to do with the obvious differences of mother tongue, dialect and accent, which reflect children's social origins, and which tend to figure in popular debates about the quality of children's talk (and what schools should do about it). Within the social differentiation that is typical within any society today, children's language experiences may vary in other ways that, while subtle, are potentially of greater significance for their educational progress. Research in the USA has provided evidence to support the view first advanced by Bernstein (1975) and others some years ago, that the amount and quality of the dialogue children experience at home is strongly correlated with their eventual academic attainment (Hart and Risley, 1995). Although life will provide most children with a rich and varied language experience, in some homes rational debates, logical deductions, reflective analyses, extended narratives and detailed explanations may never be heard. How can children be expected to incorporate such ways of using language into their repertoires, if they have no models for doing so? Without the example and guidance of a teacher, many children may not gain access to some very useful ways of using language as a tool for reasoning, learning and working collaboratively because those 'ways with words' (Heath, 1983) are simply not part of their experience. As we will describe in Chapter 6, our own research has shown that when teachers focus on the development of children's language as a tool for reasoning, this can lead to significant improvements in the quality of children's problem solving and academic attainment. Nevertheless, relatively few schools explicitly teach this kind of language use. One of the arguments we will make in the book is that there is not enough emphasis in educational policy and practice on the value of teaching children how to use language for learning.

What do we mean by learning and development?

'Learning' and 'development' are terms that have both been used a great deal in developmental psychology, while 'learning', often in the company of 'teaching', is of course a common term in educational studies. We have used the two words together because we feel that both are required to invoke the kinds of cognitive, intellectual changes that we are interested in here. Both have been applied to individuals, to groups and to societies as a whole. The educational researcher Watkins (2003) distinguishes three influential conceptions of learning: 'Learning is being taught', 'Learning is individual sense-making', and 'Learning is building knowledge with others'. These are not at all incompatible, and from our perspective are complementary. 'Learning' is normally associated with the gaining of knowledge, with the acquisition of some fact or skill. We can learn something, and we may forget it. In this book we are not concerned with the processes by which people commit new information to memory (as when one memorizes a friend's new telephone number, or when a science student becomes able to recall the sequence of elements in the periodic table). Rather, we are concerned with the ways people learn to make sense of the world, become able to solve problems and—in school settings—take on new perspectives such as those inherent in science, mathematics and other subjects.

'Development' usually implies some change of a progressive kind. It invokes ideas of some sort of growth, the emergence of a new entity, the arrival of a new state of affairs. Children often forget something they have learned, and in many circumstances this would not be a cause for alarm; but developmental regression in a child would be expected to ring alarm bells. We are using both terms because we are not only interested in how dialogue contributes to the ways that people make sense together and gain knowledge from social interaction, but also how it enables them to become progressively more able to carry out certain kinds of intellectual activities.

How does interaction help learning and development?

Research into the processes of learning and cognitive development has been transformed in the last 20 years by the emergence of sociocultural theory, which is also sometimes described as 'socio-historical' and 'cultural-historical' (see, for example, Wertsch, 1985a; Daniels, 2001; Wells and Claxton, 2002). Its origins lie mainly in the work of the Russian psychologist Lev Vygotsky (for example, Vygotsky, 1962, 1978). Sociocultural research is not a unified field, but those within it treat communication, thinking and learning as processes shaped by culture, whereby knowledge is shared and understandings are jointly constructed. Communicative events are shaped by cultural and historical factors, and thinking, learning and development cannot be understood without taking account of the intrinsically social and communicative nature of human life.

From a sociocultural perspective, humans are seen as creatures who have a unique capacity for communication and whose lives are normally led within groups, communities and societies based on shared ways of using language, ways of thinking,

social practices and tools for getting things done. Education is seen as a dialogic process, with students and teachers working within settings that reflect the values and social practices of schools as cultural institutions. A sociocultural perspective raises the possibility that educational success and failure may be explained by the quality of educational dialogue, rather than simply by considering the capability of individual students or the skill of their teachers. It encourages the investigation of the relationship between language and thinking and also of the relationship between what Vygotsky called the 'intermental' and the 'intramental'—the social and the psychological—in the processes of learning, development and intellectual endeavour. Partly through the influence of these ideas, social interaction has increasingly come to be seen as significant in shaping children's cognitive development. We give special attention to this topic in Chapter 2.

How does language enable collaborative learning?

Many human activities involve not just the sharing of information and the coordination of social interaction, but also people working together to solve problems. When they do so, people do not only interact, they 'interthink', combining their intellects in creative ways that may achieve more than the sum of the parts. In such problem-solving situations there is a dynamic engagement with ideas amongst partners, with language as the principal means for establishing shared understanding, testing out possible solutions and trying to reach some agreement. Thinking together is an important part of life, but it has traditionally been ignored or even repressed in school. In recent years, though, the potential value of children's collaborative activity for their learning and development has begun to be appreciated. In Chapter 3 we review research on children's collaborative learning for what it can tell us about the factors that contribute to joint activity being productive.

How can dialogue with a teacher help children learn?

In Chapter 4, we turn our attention to talk between teachers and students. This is a topic that has been studied by many people for many years, but new and useful insights have emerged in relatively recent times. The findings of research now offer a clearer and more secure understanding of how teacher-student dialogue can be used to good effect—and of how opportunities for productive dialogue may sometimes be squandered. Our own interest in such matters is not merely as detached observers, analysts, assessors or critics of the education system. As members of an international team of applied educational researchers, we have worked closely with teachers and children to try to understand and improve the educational process.

Discussions about the teacher's role sometimes oppose two models: the instructor and transmitter of knowledge on the one hand, and on the other the facilitator and co-learner. These models often figure in debates about the relative value of traditional and progressive educational methods, or about transferring control of education from the teacher to the learner. Such simple dichotomies are useful for political rhetoric, but are of

little value for understanding what makes education more or less effective. Instead, we need to appreciate the diverse ways that the roles of teachers and learners can be enacted and to understand that they can shift and adapt within the classroom context, from one activity to another as is appropriate. As we will show, the close study of the dialogues between teachers and students can help the planning of activities to ensure that opportunities are provided for teachers and students to construct knowledge and understanding together.

What are the implications for educational theory and practice?

Vygotsky proposed that children's intellectual development is shaped by the acquisition of language, because language makes dialogue possible between children and other members of their community. This proposal is fundamental to sociocultural explanations of learning and development. But our allegiance to a sociocultural perspective does not mean that we have simply assumed the truth of Vygotsky's proposal—for which he provided little empirical evidence. One of the aims of the research we and our colleagues have carried out has been to put Vygotsky's ideas to the test. We have done so through creating and evaluating interventional educational programmes that embody a distinctive approach to language as a tool for teaching and learning. This approach, called *Thinking Together* and which is described in Chapter 5, has been tried and tested in schools in several countries. It represents sociocultural theory in action, in two rather different ways. First, it illustrates the practical consequences of basing an approach to teaching upon the notion of language as the principal cultural and psychological tool for building knowledge. Second, its implementation has allowed ordinary classrooms to become environments for testing the utility of sociocultural theory. As we will show in Chapter 6, the results have not only provided support for Vygotsky's claims about the relationship between the social and the psychological, they also have implications for educational practice.

What are the implications for future research?

A key feature of our approach to analysing and evaluating educational dialogue is to treat it as a process that is orientated to both the past and the future. That is, the meaning and value of dialogue for those involved in it depends on its history and where it is heading. This is not just a matter of the interests of speakers being brought to bear and so influencing the direction of the dialogue, but also the extent to which there is a basis of common knowledge that will enable participants to make sense together. Dialogues are cultural artefacts, because they embody participants' practical knowledge about how to talk in a particular kind of situation. Classroom dialogue depends on speakers understanding the 'rules of the game'. However, as we explain in Chapters 4, 5 and 6, those rules may not always be ones that help children gain an education from their school experience.

In any particular interaction, speakers use their existing knowledge to build contextual foundations for the progress of their talk. They use talk itself as a tool for creating new shared understanding. If we are interested in explaining and evaluating the processes of teaching and learning, we need to understand how teachers and learners use language to create new common knowledge. But this is a difficult topic to research, because spoken interaction, in classrooms or any other settings, has a temporal dimension. School lessons begin and end, but the dialogues within them do not necessarily have the same beginnings and ends. People take up topics they began to discuss on earlier occasions, refer to events that have happened in the meantime, and often orientate their discussions towards future activities and outcomes. Educational dialogues are particularly dependent on appeals to knowledge already gained and to learning goals ahead. In Chapter 7 we look at this vital, intriguing but complicated aspect of talk in classrooms and its significance for investigating and understanding learning and development.

In the final chapter of the book, we will do what is customary at that point: summarize what is known about the nature and functions of educational dialogue and draw some conclusions about how this should affect our understanding of children's learning and intellectual development. We will also draw out some implications for the practice of teaching and learning.

References

Alexander, R. (2000) *Culture and Pedagogy: International Comparisons in Primary Education,* Oxford: Blackwell.

Alexander, R. (2004) *Towards Dialogic Teaching: Rethinking Classroom Talk,* Cambridge: Dialogos.

Alexander, R. (2005) 'Culture, dialogue and learning: Notes on an emerging pedagogy', paper presented at the *International Association for Cognitive Education and Psychology (IACEP),* 10th International Conference, University of Durham, UK, July.

Anderson, R.C., Chinn, C., Waggoner, M. and Nguyen, K. (1998) 'Intellectually-stimulating story discussions', in J.Osborn and F.Lehr (eds) *Literacy for All: Issues in Teaching and Learning,* New York: Guilford Press.

Arvaja, M. (2005) 'Collaborative knowledge construction in authentic school contexts', doctoral thesis, Institute of Educational Research, University of Jyväskylä, Jyväskylä: University Printing House.

Azmitia, M. and Montgomery, R. (1993) 'Friendship, transactive dialogues and the development of scientific reasoning', *Social Development* 2 (3):202–221.

Bakhtin, M. (1981) *The Dialogic Imagination,* Austin: University of Texas Press.

Barbieri, M. and Light, P. (1992) 'Interaction, gender and performance on a computer-based task', *Learning and Instruction* 2 (1):199–213.

Barnes, D. (1976) *From Communication to Curriculum,* Harmondsworth: Penguin Books.

Barnes, D. (1992) 'The role of talk in learning', in K.Norman (ed.) *Thinking Voices: The Work of the National Oracy Project,* London: Hodder and Stoughton.

Barnes, D. and Todd, F. (1977) *Communication and Learning in Small Groups,* London: Routledge and Kegan Paul.

Barnes, D. and Todd, F. (1995) *Communication and Learning Revisited,* Portsmouth, NH: Heinemann.

Barron, B. (2000) 'Achieving co-ordination in collaborative problem-solving groups', *Journal of the Learning Sciences* 9 (4):403–436.

Bennett, N. and Cass, A. (1988) 'The effects of group composition on group interactive processes and pupil understanding', *British Educational Research Journal* 15 (1):19–32.

Bennett, N. and Dunne, E. (1992) *Managing Classroom Groups,* London: Simon and Schuster.

Bereiter, C. (1997) 'Situated cognition and how to overcome it', in D.Kirschner and J.Whitson (eds) *Situated Cognition: Social, Semiotic and Psychological Perspectives,* Hillsdale, NJ: Erlbaum.

Bernstein, B. (1971) *Class, Codes and Action Vol. I: Theoretical Studies Towards a Sociology of Language,* London: Routledge and Kegan Paul.

Bernstein, B. (1975) *Class, Codes and Action. Vol. III: Towards a Theory of Educational Transmissions,* London: Routledge and Kegan Paul.

Blatchford, P. and Kutnick, P. (2003) 'Developing groupwork in everyday classrooms', Special Issue, *International Journal of Educational Research,* 39 (1–2):1–172.

Blatchford, P., Kutnick, P., Baines, E. and Galton, M. (2003) 'Towards a social pedagogy of classroom groupwork', *International Journal of Educational Research* 39: 153–172.

Blaye, A. (1988) 'Confrontation sociocognitive et resolution de probleme', unpublished doctoral thesis, University of Provence: Aix-en-Provence.

Bloome, D. and Egan-Robertson, A. (1993) 'The social construction of intertextuality and classroom reading and writing', *Reading Research Quarterly* 28 (4): 303–333.

Brown, A.L. and Palincsar, A.S. (1989) ‘Guided, co-operative learning and individual knowledge acquisition’, in L.B.Resnick (ed.) *Knowing, Learning and Instruction,* Hillsdale, NJ: Lawrence Erlbaum.
Bruner, J.S. (1978) ‘The role of dialogue in language acquisition’, in A.Sinclair, R.Jarvella and W.Levelt (eds) *The Child’s Conception of Language,* New York: Springer-Verlag.
Bruner, J.S. (1985) ‘Vygotsky: a historical and conceptual perspective’, in J.V.Wertsch (ed.) *Culture, Communication and Cognition: Vygotskian Perspectives,* Cambridge: Cambridge University Press.
Chinn, C.F. and Anderson, R. (1998) ‘The structure of discussions that promote reasoning’, *Teachers College Record* 100:315–368.
Claxton, G. (2002) ‘Education for the learning age: a sociocultural approach to learning to learn’, in G.Wells and G.Claxton (eds) *Learning for Life in the 21st Century,* Oxford: Blackwell.
Cobb, P. (1999) ‘Individual and collective mathematical learning: the case of statistical data analysis’, *Mathematical Thinking and Learning* 18 (1):46–48.
Cobb, P., Yackel, K., and McClain, K. (2000) (eds) *Symbolizing and Communicating: Perspectives on Mathematical Discourse, Tools, and Instructional Design,* Mahwah, NJ: Erlbaum.
Cohen, E.G. (1994) ‘Restructuring the classroom: conditions for productive small groups’, *Review of Educational Research* 64 (1):1–35.
Cook, G. (2003) *Applied Linguistics,* Oxford: Oxford University Press.
Crook, C. (1994) *Computers and the Collaborative Experience of Learning,* London and New York: Routledge.
Crook, C. (1999) ‘Computers in the community of classrooms’, in K.Littleton and P.Light (eds) *Learning with Computers: Analysing Productive Interaction,* London: Routledge.
Daniels, H. (2001) *Vygotsky and Pedagogy,* London: Routledge/Falmer.
Davis, A. (1991) ‘Piaget, teachers and education: into the 1990s’, in P.Light, S.Sheldon and M.Woodhead (eds) *Learning to Think,* London: Routledge.
Dawes, L. (2004) ‘Talk and learning in classroom science’, *International Journal of Science Education* 26 (6):677–695.
Dawes, L. (2005) ‘Speaking, listening and thinking with computers’, in L.Grugeon, L.Dawes, L.C.Smith and L.Hubbard (eds) *Teaching, Speaking and Listening in the Primary School (Third Edition),* London: David Fulton.
Dawes, L. and Sams, C. (2004a) ‘Developing the capacity to collaborate’, in K.Littleton, D.Miell and D.Faulkner (eds) *Learning to Collaborate, Collaborating to Learn,* New York: Nova.
Dawes, L. and Sams, C. (2004b) *Talk Box: Speaking and Listening Activities for Learning at Key Stage 1*, London: David Fulton.
Dawes, L., Mercer, N. and Wegerif, R. (2003) *Thinking Together: A Programme of Activities for Developing Speaking, Listening and Thinking Skills for Children aged 8–11,* Birmingham: Imaginative Minds Ltd.
Dawes, L., English, J., Holmwood, R., Giles, J., and Mercer, N. (2005) *Thinking Together in Geography: Using Speaking and Listening to Develop Thinking Skills at KS3,* Stevenage: Badger Publishing.
DES (Department of Education and Science) (1975) *The Bullock Report,* London: HMSO.
DFE (Department for Education) (1995) *The Orders of the National Curriculum,* London: HMSO.
Dillenbourg, P. (1999) *Collaborative Learning: Cognitive and Computational Approaches,* Oxford: Pergamon.
Dillenbourg, P., Baker, M., Blaye, A. and O’Malley, C. (1995) ‘The evolution of research on collaborative learning’, in H.Spada and P.Reiman (eds) *Learning in Humans and Machines: Towards an Interdisciplinary Learning Science,* Oxford: Elsevier.
Dillon, J.J. (ed.) (1988) *Questioning and Discussion: A Multidisciplinary Study,* London: Croom Helm.
Doise, W. and Mugny, G. (1984) *The Social Development of the Intellect,* Oxford: Pergamon Press.
Donaldson, M. (1978) *Children’s Minds,* London: Fontana Press.

Edwards, D. and Mercer, N. (1987) *Common Knowledge: The Development of Understanding in the Classroom,* London: Methuen/Routledge.
Elbers, E. and Streefland, L. (2000) 'Collaborative learning and the construction of common knowledge', *European Journal of Psychology of Education* XV (4):479–490.
Erickson, F. (1996) 'Going for the zone: the social and cognitive ecology of teacher-student interaction in classroom conversations', in D.Hicks (ed.) *Discourse, Learning and Schooling,* Cambridge: Cambridge University Press.
Fernández Cardenas, J.M. (2004) 'The appropriation and mastery of cultural tools in computer-supported collaborative literacy practices', doctoral thesis, Open University, Milton Keynes, UK.
Fernández, F., Wegerif, R., Mercer, N., Rojas-Drummond, S. (2001/2002) 'Re-conceptualizing "scaffolding" and the Zone of Proximal Development in the context of symmetrical collaborative learning', *Journal of Classroom Interaction* 36/37 (2/1):40–54.
Fisher, E. (1993) 'Distinctive features of pupil-pupil talk and their relationship to learning', *Language and Education* 7 (4):239–258.
Fitzpatrick, H. (1996) 'Peer collaboration and the computer', unpublished doctoral thesis, University of Manchester.
Forman, E. (1996) 'Learning mathematics as participation in classroom practice: implications of sociocultural theory for educational reform', in L.Steffe, P.Nesher, P.Cobb, G.Goldin and B.Greer (eds) *Theories of Mathematical Learning,* Hillsdale, NJ: Erlbaum.
Fuchs, L.S. and Fuchs, D. (2000) 'Effects of workgroup structure and size on student productivity during collaborative work on complex tasks', *Elementary School Journal* 100 (3):183.
Galton, M. and Williamson, J. (1992) *Group Work in the Primary Classroom,* London: Routledge.
Galton, M., Simon, B. and Croll, P. (1980) *Inside the Primary Classroom (the ORACLE Project),* London: Routledge and Kegan Paul.
Galton, M., Hargreaves, L., Comber, C., Wall, D. and Pell, A. (1999) *Inside the Primary Classroom: 20 Years On,* London: Routledge.
Gee, J. (2000) 'Discourse and socio-cultural studies in reading', in M.Kamil, B.Mosenthal, P.Pearson and R.Barr (eds) *Handbook of Reading Research, Volume III*, London: Lawrence Erlbaum Associates.
Gee, J.P. (1999) *An Introduction to Discourse Analysis: Theory and Method.* London: Routledge.
Gee, J.P. (2003) *What Video Games Have to Teach us about Learning and Literacy,* London: Palgrave Macmillan.
Gee, J.P. (2004) *Situated Language and Learning: A Critique of Traditional Schooling,* London: Routledge.
Gee, J.P. and Green, J. (1998) 'Discourse analysis, learning and social practice: a methodological study', *Review of Research in Education* 23:119–169.
Gibbons, P. (2002) *Scaffolding Language, Scaffolding Learning: Teaching Second Language Learners in the Mainstream Classroom,* Portsmouth, NH: Heinemann.
Goldenberg, C. (1993) 'Instructional conversations: promoting comprehension through discussion', *The Reading Teacher* 46:316–326.
Greenfield, P.M. and Lave, J. (1982) 'Cognitive aspects of informal education', in D.Wagner and H.Stephenson (eds) *Cultural Perspectives on Child Development,* San Francisco: Freeman.
Grice, H. (1975) 'Logic and conversation', in P.Cole and J.Morgan (eds) *Syntax and Semantics 3: Speech Acts,* New York: Academic Press.
Grossen, M. and Bachmann, K. (2000) 'Learning to collaborate in a peer-tutoring situation: who learns? what is learned?', *European Journal of Psychology of Education* XV (4):491–508.
Halliday, M.A.K. (1978) *Language as a Social Semiotic: The Social Interpretation of Meaning,* London: Edward Arnold.
Halliday, M.A.K. and Hasan, R. (1976) *Cohesion in English,* London: Longman.
Hart, B. and Risley, T.R. (1995) *Meaningful Differences in the Everyday Experience of Young American Children,* New York: Brookes.

Hartup, W.W. (1998) 'The company they keep: friendships and their developmental significance', in A.Campbell and S.Muncer (eds) *The Social Child,* Hove: The Psychology Press.
Heath, S.B. (1983) *Ways with Words: Language, Life and Work in Communities and Classrooms,* Cambridge: Cambridge University Press.
Heritage, J. (1984) *Garfinkel and Ethnomethodology,* Cambridge: Polity Press.
Hester, S. and Francis, D. (2000) 'Ethnomethodology, conversational analysis and "institutional talk"', *Text* 20 (3): 391–413.
Hoogsteder, M., Maier, R. and Elbers, E. (1998) 'Adult-child interaction, joint problem solving and the structure of cooperation', in M.Woodhead, D.Faulkner and K.Littleton (eds) *Cultural Worlds of Early Childhood,* London: Routledge.
Howe, C. (1997) *Gender and Classroom Interaction: A Research Review,* Edinburgh: The Scottish Council for Research in Education.
Howe, C. and Tolmie, A. (1999) 'Productive interaction in the context of computer supported collaborative learning in science', in K.Littleton and P.Light (eds) *Learning with Computers: Analysing Productive Interaction,* London, Routledge.
Howes, C. and Ritchie, S. (2002) *A Matter of Trust: Connecting Teachers and Learners in the Early Childhood Classroom,* New York: Teachers College Press.
Issroff, K. (1999) 'Time-based analysis of students studying the Periodic Table', in K. Littleton and P.Light (eds) *Learning with Computers: Analysing Productive Interaction,* London: Routledge.
Järvelä, S. (1995) 'The cognitive apprenticeship model in a technologically rich learning environment: interpreting the learning interaction', *Learning and Instruction* 5 (3):237–259.
Johnson, D.W. and Johnson, F. (1997) *Joining Together. Group Theory and Group Skills,* 6th edition, Boston: Allyn and Bacon.
Keefer, M., Zeitz, C. and Resnick, L. (2000) 'Judging the quality of peer-led student dialogues', *Cognition and Instruction* 18 (1):53–81.
Keogh, T., Barnes, P., Joiner, R. and Littleton, K. (2000) 'Computers, verses, papergirls versus boys: gender and task presentation effects', *Educational Psychology* 20 (1):33–44.
Kim, I-H., Anderson, R., Nguyen-Jahiel, K. and Archodidou, A. (in press) 'Discourse patterns during children's online discussions', *Journal of the Learning Sciences*.
Kleine-Staarman, J. (in press) 'Collaboration in CSCL: Social Interaction in Primary School Computer-Supported Collaborative Learning Environments', doctoral thesis submitted to Radboud University Nijmegen, The Netherlands, Institute of Behavioural Sciences.
Kumpulainen, K. and Wray, D. (eds) (2002) *Classroom Interaction and Social Learning: From Theory to Practice,* London: Routledge-Falmer.
Kutnick, P. (2005) 'Relational training for group working in classrooms: experimental and action research perspectives', paper presented as part of the *Educational Dialogue Research Unit Seminar Series,* Open University, Milton Keynes, June.
Kutnick, P. and Rogers, C. (1994) *Groups in Schools,* London: Cassell.
Lambirth, A. (2006) 'Challenging the laws of talk: ground rules, social reproduction and the curriculum', *The Curriculum Journal,* 17 (1):59–71.
Lave, J. and Wenger, E. (1991) *Situated Learning: Legitimate Peripheral Participation,* Cambridge: Cambridge University Press.
Lemke, J. (2001) 'The long and the short of it: comments on multiple timescale studiers of human activity', *The Journal of the Learning Sciences* 10 (1 and 2):17–26.
Light, P. (1997) 'Computers for learning: psychological perspectives', *Journal of Child Psychology and Psychiatry* 38 (5):497–504.
Light, P. and Littleton, K. (1999) *Social Processes in Children's Learning,* Cambridge: Cambridge University Press.
Light, P., Sheldon, S. and Woodhead, M. (1991) *Learning to Think,* London: Routledge in association with the Open University.
Lipman, M. (1970) *Philosophy for Children,* Montclair, NJ: Institute for the Advancement of Philosophy for Children.

Littleton, K. (1999) 'Productivity through interaction: an overview', in K.Littleton and P.Light (eds) *Learning with Computers: Analyzing Productive Interaction,* London: Routledge.

Littleton, K. and Miell, D. (2004) 'Collaborative creativity: contemporary perspectives', in D.Miell and K.Littleton (eds) *Collaborative Creativity: Contemporary Perspectives,* London: Free Association Books.

Littleton, K. and Wood, C. (2006) 'Psychology and education: understanding teaching and learning', in C.Wood, K.Littleton and K.Sheehy (eds) *Developmental Psychology in Action,* Oxford: Blackwell Publishing.

Littleton, K., Miell, D. and Faulkner, D. (2004) *Learning to Collaborate, Collaborating to Learn,* New York: Nova Publishing.

Littleton, K., Mercer, N., Dawes, L., Wegerif, R., Rowe, D. and Sams, C. (2005) 'Thinking together at Key Stage 1', *Early Years: An International Journal of Research and Development* 25 (2):165–180.

Makitalo, A. and Säljö, R. (2002) 'Talk in institutional context and institutional context in talk: categories as situated practices', *Text* 22 (1):57–82.

Maybin, J. (2006) *Children's Voices: Talk, Knowledge and Identity,* Basingstoke: Palgrave Macmillan.

Maybin, J., Mercer, N. and Stierer, B. (1992) '"Scaffolding" learning in the classroom', in K.Norman (ed.) *Thinking Voices: The Work of the National Oracy Project,* London: Hodder and Stoughton.

Mercer, N. (1995) *The Guided Construction of Knowledge: Talk Amongst Teachers and Learners,* Clevedon: Multilingual Matters.

Mercer, N. (2000) *Words and Minds: How We Use Language to Think Together,* London: Routledge.

Mercer, N. (2005) 'Sociocultural discourse analysis: analysing classroom talk as a social mode of thinking', *Journal of Applied Linguistics* 1 (2):137–168.

Mercer, N. and Sams, C. (2006) 'Teaching children how to use language to solve maths problems', *Language and Education* 20 (6):507–527.

Mercer, N., Wegerif, R. and Dawes, L. (1999) 'Children's talk and the development of reasoning in the classroom', *British Educational Research Journal* 25 (1):95–111.

Mercer, N., Littleton, K., Wegerif, R. (2004) 'Methods for studying the processes of interaction and collaborative activity in computer-based educational activities', *Technology, Pedagogy and Education,* 13 (2), 193–209.

Mercer, N., Dawes, R., Wegerif, R. and Sams, C. (2004) 'Reasoning as a scientist: ways of helping children to use language to learn science', *British Educational Research Journal* 30 (3):367–385.

Michaels, S. and O'Connor, M.C. (2002) *Accountable Talk: Classroom Conversation That Works,* CD-ROM, Pittsburg, PA: University of Pittsburgh.

Miell, D. and Littleton, K. (eds) (2004) *Collaborative Creativity: Contemporary Perspectives,* London: Free Association Books.

Moll, L.C. (1990) 'Introduction', in L.C.Moll (ed.) *Vygotsky and Education: Instructional Implications and Applications of Sociohistorical Psychology,* Cambridge: Cambridge University Press.

Mortimer, E.F. and Scott, P.H. (2003) *Meaning Making in Science Classrooms,* Milton Keynes: Open University Press.

Mugny, G., Perret-Clermont, A-N. and Doise, W. (1981) 'Interpersonal coordinations and sociological differences in the construction of the intellect', in G.Stevenson and G.Davis (eds) *Applied Social Psychology,* Vol. 1, Chichester: Wiley.

Newman, D., Griffin, P. and Cole, M. (1989) *The Construction Zone: Working for Cognitive Change in School,* Cambridge: Cambridge University Press.

Norman, K. (ed.) (1992) *Thinking Voices: The Work of the National Oracy Project,* London: Hodder and Stoughton.

Nystrand, M. (1986) *The Structure of Written Communication: Studies of Reciprocity Between Writers and Readers,* London: Academic Press.
Nystrand, M., Wu, L., Gamorgan, A., Zeiser, S. and Long, D. (2003) 'Questions in time: investigating the structure and dynamics of unfolding classroom discourse', *Discourse Processes* 35 (2):135–198.
Olson, D.R. (1994) *The World on Paper,* Cambridge: Cambridge University Press.
Papert, S. (1980) *Mindstorms: Children, Computers and Powerful Ideas,* New York: Basic Books.
Perret-Clermont, A-N. (1980) *Social Interaction and Cognitive Development in Children,* London: Academic Press.
Perret-Clermont, A-N. (1993) 'What is it that develops?' *Cognition and Instruction* 11 (3/4): 197–205.
Piaget, J. (1932) *The Moral Judgement of the Child,* London: Routledge.
Piaget, J. (1967) 'Development and learning', in E.Victor and M.S.Lerner (eds) *Readings in Science Education for the Elementary School,* New York: Macmillan.
Piaget, J. and Inhelder, B. (1956) *The Child's Conception of Space,* London: Routledge.
Rasmussen, I. (2005) 'Project work and ICT: studying learning as participation trajectories', Doctoral Thesis, Faculty of Education, University of Oslo: Norway.
Raven, J., Court, J. and Raven, J.C. (1995) *Manual For Raven's Progressive Matrices and Vocabulary Scales,* Oxford: Oxford Psychologists Press.
Resnick, L.B. (1999) 'Making America smarter', *Education Week Century Series* 18 (40):38–40.
Resnick, L., Pontecorvo, C. and Säljö, R. (1997) 'Discourse, tools and reasoning', in L.Resnick, R.Säljö, C.Pontecorvo and B.Burge (eds) *Discourse, Tools and Reasoning: Essays on Situated Cognition,* Berlin and New York: Springer-Verlag.
Rogoff, B. (1990) *Apprenticeship in Thinking: Cognitive Development in Social Context,* Oxford: Oxford University Press.
Rojas-Drummond, S. (2000) 'Guided participation, discourse and the construction of knowledge in Mexican classroom', in H.Cowie and G.van der Aalsvoort (eds) *Social Interaction in Learning and Instruction,* Oxford: Pergamon.
Rojas-Drummond, S. and Mercer, N. (2004) 'Scaffolding the development of effective collaboration and learning', *International Journal of Educational Research* 39: 99–111.
Rojas-Drummond, S., Mercer, N. and Dabrowski, E. (2001) 'Collaboration, scaffolding and the promotion of problem solving strategies in Mexican preschoolers', *European Journal of Psychology of Education* XVI (2):179–196.
Roth, W-M. (2001) 'Situating cognition', *The Journal of the Learning Sciences* 10 (1 and 2):27–61.
Roth, W-M. (2005) *Talking Science: Language and Learning in Science,* Lanham, MD: Rowman and Littlefield.
Roth, W-M. (2006) *Learning Science: A Singular Plural Perspective,* Rotterdam: Sense Publishers.
Ryder, J. and Campbell, L. (1989) 'Groupsense: when groupwork does not add up to "groupwork"', *Pastoral Care in Education* 7 (1):22–30.
Sams, C., Wegerif, R., Dawes, L. and Mercer, N. (2000) *Thinking Together with ICT and Primary Mathematics: A Continuing Professional Development Pack,* London: Smile Mathematics.
Schegloff, E. (1992) 'In another context', in A.Duranti and C.Goodwin (eds) *Rethinking Context: Language as an Interactive Phenomenon,* Cambridge: Cambridge University Press.
Schegloff, E. (1997) 'Whose text? Whose context?' *Discourse and Society,* 8 (2): 165–187.
Scott, P. (1998) 'Teacher talk and meaning making in science classrooms: a Vygotskian analysis and review', *Studies in Science Education* 32:45–80.
Scott, P., Mortimer, E. and Aguiar, O. (2006) 'The tension between authoritative and dialogic discourse: a fundamental characteristic of meaning making interactions in high school science lessons', *Science Education* 90:605–631.
Scott, P.H. and Asoko, H. (2006) 'Talk in science classrooms', in V.Wood-Robinson (ed.) *Association of Science Education Guide to Secondary Science Education,* Hatfield, Herts: Association for Science Education (ASE).

Sfard, A. and Kieran, C. (2001) 'Cognition as communication: rethinking learning-by-talking through multi-faceted analysis of students' mathematical interactions', *Mind, Culture, and Activity* 8 (1):42–76.

Shayer, M. (2003) 'Not just Piaget; not just Vygotsky, and certainly not Vygotsky as alternative to Piaget', *Learning and Instruction* 13:465–485.

Sinclair, J. and Coulthard, M. (1975) *Towards an Analysis of Discourse: The English Used by Teachers and Pupils,* Oxford: Oxford University Press.

Slavin, R.E. (1980) 'Co-operative learning', *Review of Educational Research* 50 (2): 315–342.

Swann, J. (1992) *Girls, Boys and Language,* London: Blackwell.

Tharp, R. and Gallimore, R. (1998) 'A theory of teaching as assisted performance', in D.Faulkner, K.Littleton and M.Woodhead (eds) *Learning Relationships in the Classroom,* London: Routledge.

Tharp, R.G. and Gallimore, R. (1988) *Rousing Minds to Life: Teaching, Learning and Schooling in Social Context,* Cambridge: Cambridge University Press.

The Open University (1991) *Talk and Learning 5–16: An In-Service Pack on Oracy for Teachers,* Milton Keynes: Open University.

Tudge, J. (1989) 'When collaboration leads to regression: some negative consequences of socio-cognitive conflict', *European Journal of Social Psychology* 19: 123–138.

Turkle, S. (1996) *Life on the Screen: Identity in the Age of Internet,* London: Weidenfeld and Nicholson.

Underwood, J. and Underwood, G. (1999) 'Task effects in co-operative and collaborative learning with computers', in K.Littleton, and P.Light (eds) *Learning with Computers: Analysing Productive Interaction,* London: Routledge.

Van Boxtel, C., Van der Linden, J. and Kanselaar, G. (2000) 'Collaborative learning tasks and the elaboration of conceptual knowledge', *Learning and Instruction,* 10 (4):311–330.

Van Oers, B. and Hännikäinen, M. (2001) 'Some thoughts on togetherness: an introduction', *International Journal of Early Years Education* 9 (2):101–108.

Vass, E. (2003) 'Understanding collaborative creativity: an observational study of the effects of the social and educational context on the processes of young children's joint creative writing', Doctoral Thesis, Milton Keynes: Open University.

Vygotsky, L.S. (1962) *Thought and Language,* Cambridge, MA: MIT Press

Vygotsky, L.S. (1978) *Mind in Society,* Cambridge, MA: Harvard University Press.

Vygotsky, L.S. (1981) 'The genesis of higher mental functions', in J.V.Wertsch (ed.) *The Concept of Activity in Soviet Psychology,* Armonk, NY: Sharpe.

Watkins, C. (2003) *Learning: A Sense Maker's Guide,* London: The Institute of Education.

Webb, N.M. (1989) 'Peer interaction and learning in small groups', *International Journal of Educational Research* 1 (1):21–39.

Wegerif, R. (2004) 'The role of educational software as a support for teaching and learning conversations', *Computers and Education* 43:179–191.

Wegerif, R. (in press (a)) 'From dialectic to dialogic: a response to Wertsch and Kazak', in T.Koschmann (ed.) *Theorizing Learning Practice,* Mahwah, NJ: Lawrence Erlbaum Associates.

Wegerif, R. (in press (b)) 'Dialogic or dialectic? The significance of ontological assumptions in research on educational dialogue', *British Educational Research Journal*.

Wegerif, R. and Dawes, L. (2004) *Thinking and Learning with ICT: Raising Achievement in Primary Classrooms,* London: Routledge.

Wegerif, R. and Mercer, N. (1997) 'Using computer-based text analysis to integrate qualitative and quantitative methods in the investigation of collaborative learning', *Language and Education* 11 (4):271–286.

Wegerif, R. and Scrimshaw, P. (eds) (1997) *Computers and Talk in the Primary Classroom,* Clevedon: Multilingual Matters.

Wegerif, R., Littleton, K. and Jones, A. (2003) 'Stand-alone computers supporting learning dialogues in primary classrooms', *International Journal of Educational Research* 39 (8):851–861.

Wegerif, R., Mercer, N. and Dawes, L. (1999) 'From social interaction to individual reasoning: an empirical investigation of a possible socio-cultural model of cognitive development', *Learning and Instruction* 9:493–516.

Wells, G. (1986) *The Meaning Makers,* London: Hodder and Stoughton.

Wells, G. (1999) *Dialogic Enquiry: Toward a Sociocultural Practice and Theory of Education,* Cambridge: Cambridge University Press.

Wells, G. and Claxton, G. (eds) (2002) *Learning for Life in the 21st Century,* Oxford: Blackwell.

Wertsch, J.V. (ed.) (1985a) *Culture, Communication and Cognition: Vygotskian Perspectives,* Cambridge: Cambridge University Press.

Wertsch, J.V. (1985b) 'Adult-child interaction as a source of self-regulation in children', in S.R.Yussen (ed.) *The Growth of Reflection in Children,* Orlando, FL: Academic Press.

Wertsch, J.V. (1991a) 'A sociocultural approach to socially shared cognition', in L.B.Resnick, J.M.Levine, and S.D.Teasley (eds) *Perspectives on Socially Shared Cognition,* Washington: American Psychological Association.

Wertsch, J.V. (1991b) *Voices of the Mind: A Sociocultural Approach to Mediated Action,* London: Harvester Wheatsheaf.

Wertsch, J.V. (1997) 'The sociocultural approach to learning', paper presented to an Inaugural Conference of the Centre for Learning in Organisations, School of Education, University of Bristol, January.

Wilkinson, I. and Fung, I. (2002) 'Small group composition and peer effects', *International Journal of Educational Research* 37:425–447.

Wood, D. (1992) 'Teaching talk', in K.Norman (ed.) *Thinking Voices: The Work of the National Oracy Project,* London: Hodder and Stoughton.

Wood, D. (1998) *How Children Think and Learn: The Social Contexts of Cognitive Development,* Oxford: Blackwell.

Wood, D. and Middleton, D. (1975) 'A study of assisted problem solving', *British Journal of Psychology* 66:181–191.

Wood, D., Bruner, J. and Ross, G. (1976) 'The role of tutoring in problem solving', *Journal of Child Psychology and Psychiatry* 17:89–100.

Wood, H., and Wood, D. (1999) 'Help seeking, learning and contingent tutoring', *Computers and Education* 33:153–169.

Yackel, E., Cobb, P. and Wood, T. (1991) 'Small group interactions as a source of learning opportunities in second-grade mathematics', *Journal for Research in Mathematics Education* 22 (5):390–408.

Youniss, J. (1999) 'Children's friendship and peer culture', in M.Woodhead, D.Faulkner and K.Littleton (eds) *Making Sense of Social Development,* London: Routledge.