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Computer-assisted systematic observation of classroom discourse & interaction

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Computer-assisted systematic observation of classroom discourse and interaction: *Technical report on the systematic observation component of the Towards Dialogue study*

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Abstract

This report details methods and findings from the computer-assisted systematic observation component of the ESRC-funded *Towards Dialogue: A Linguistic Ethnographic Study of Classroom Interaction and Change* project. The background to this research is the widespread advocacy of dialogic teaching, on the one hand, alongside the relative stability over time of traditional (largely monologic) classroom interactional patterns, on the other. In this paper we explore this phenomenon through computer-assisted systematic observation of the literacy lessons of three teachers in one East London Primary School. This method is used (1) to situate the corpus of lessons (by comparing with a national sample), (2) to examine processes of change in classroom patterns over time, and (3) to investigate correlations between relative dialogicality and other key variables (especially teacher and pedagogic activity). The report ends with some reflections on the advantages and disadvantages of systematic observation in relation to other methods for the study of classroom discourse.

Introduction

This paper reports methods and findings from the computerised systematic observation component of the *Towards Dialogue: A Linguistic Ethnographic Study of Classroom Interaction and Change* project (ESRC-funded, award no. RES-061-25-0363).[1] The background to this research is the widespread advocacy of dialogic teaching, on the one hand, alongside the relative stability over time of traditional (largely monologic) classroom interactional patterns, on the other. The project examines this phenomenon through an extended case study of the change processes associated with a professional development programme designed to encourage and support dialogic practice in KS2 literacy lessons. In particular, we investigate:

1. the role of interactional genres in facilitating and/or impeding change of classroom practice;
2. the relationship between teachers' sensitivity to interactional dynamics and their professional practice; and
3. the explanatory power of interactional genres as a unit of analysis for making sense of what happens in classrooms.

The professional development programme involved bi-weekly professional development workshops, in which the principal investigator facilitated seven teachers' collaborative lesson planning and reflection upon video-recorded excerpts of their own classroom practice. Data collection included video and audio recordings of 73 literacy lessons in a total of 7 classrooms; 19 professional development workshops; 15 interviews with 8 teachers; and surveys of participating pupils. Data analysis integrated quantitative interrogation of the computerised systematic observation data (the focus of this paper) and linguistic ethnographic micro-analysis of select segments (see Lefstein & Snell 2011a, 2011c).

Computerised systematic observation data was used to situate the sample (by comparing it to previous studies), to examine processes of change over time, to investigate correlations between relative dialogicality and other key

[1] Further details regarding this study and key findings may be found in Lefstein and Snell (2011a, 2011b, 2011c). For full details of the project see http://esrc.ac.uk/my-esrc/grants/RES-061-25-0363/read.

variables (especially teacher and pedagogic activity), and to select episodes for micro-analysis. We also took advantage of the opportunity of working with multiple methods for the study of classroom discourse and interaction (computer-assisted systematic observation, micro-analysis, classroom learning environment surveys) to triangulate findings and probe the advantages and disadvantages of each method. This paper focuses in particular on comparing our sample with previous studies, change over time in classroom interactional patterns, and the conditions in which classroom practice was more or less dialogic.

Method

Data collection. Lesson observations began at Abbeyford Primary School (a pseudonym) in late November 2008 and continued until mid July 2009 (i.e. the end of the summer term). Observations were made in the literacy lessons of five teachers (three from Year 5 and two from Year 6). The average class at Abbeyford Primary included 29 pupils. Year 6 classes were reduced in size for literacy lessons, however, by creation of a fourth group (taught by the deputy head teacher) formed from 6 pupils from each of the usual three Year 6 classes, in order to allow for more focused literacy teaching in the run up to the Standardised Assessment Task tests (SATs).

Abbeyford is a relatively large community primary school in the London Borough of Barking and Dagenham. We chose to work in this area because the Local Authority has a long-standing interest in dialogic pedagogy and a history of developing and implementing pedagogical innovations. In particular, the local authority pioneered whole class interactive teaching in mathematics in the mid-1990s (see, e.g., Luxton and Last, 1998; Ochs, 2006), and collaborated with Robin Alexander (Cambridge University) in the *Teaching Through Dialogue* project in the mid 2000s (e.g. Alexander, 2005, 2008). A senior Local Authority advisor recommended Abbeyford Primary on account of its highly regarded, stable, and experienced teaching staff and leadership team. Furthermore, the staff had positive experiences in the previous intervention and were keen to experiment with their practice.

All classrooms in this school were arranged in a semi-horseshoe layout, in line with local authority practice. Tables were arranged to form a horseshoe around the edges of the room, with two or three tables in the centre of the horseshoe (full horseshoe layout not being possible due to space constraints). This layout meant that pupils could see each other (to a certain extent) as well as the teacher and the board.[2] Twelve to 14 lessons were observed and audio/video-recorded in each classroom across the course of the school year, for a total of 73 lessons altogether. For each lesson observed a detailed memo based on fieldnotes was prepared, summarising participants, central stages, texts, themes, and noteworthy issues or events.

Data analysis. Ten literacy lessons from each of three participating teachers were selected for systematic observation (i.e. 30 lessons in total). Two of the teachers, Ms Leigh and Mr Robbins, were from Year 5 classrooms, and the third, Ms James, taught Year 6. All three had between ten and eleven years teaching experience.[3] At the time of the observations, Ms Leigh was literacy coordinator and assistant head teacher, and Ms James was head of Year 6. These three teachers were thus matched in terms of experience, and all three had also been involved in the previous 'Teaching Through Dialogue' intervention.[4] Of the 12 to 14 lessons audio/video-recorded in each classroom, ten were selected for systematic observation. Selection of these lessons proceeded as follows: the first and last lesson in each classroom was selected, and the remaining eight lessons were selected randomly from clusters distributed evenly across the intervention period. Details of these lessons can be found in Appendix C.

[2] While conventional for Barking & Dagenham LA, this layout appears not to be usual across the country. In the follow-up to their original ORACLE study, Galton and colleagues (1999) found that children were still mainly seated around flat-topped tables, as they had been two decades earlier.

[3] They also all did teaching degrees (rather than a PGCE)

[4] Selection of the teachers was based upon these issues, and also by a further consideration: data for these three teachers was most complete (the other two teachers had requested that we audio-record only – rather than audio and video-record – some of their lessons).

Systematic observation focused only on the whole-class teaching element of the literacy lessons (defined as a whole class activity lasting longer than 2 minutes). This accounted for approximately 50 percent of the total duration of the lesson (i.e. 24 minutes of an average 48 minute lesson – see Appendix D). For each whole-class segment we coded discourse moves using the systematic observation software, *The Observer XT*[5] (Noldus 2008), using a coding system adapted from that developed by Hardman and colleagues (Hardman et al. 2003a, 2003b; Smith & Hardman 2004). This system codes discourse moves, defined as a single utterance or a string of utterances with a common function (e.g. to explain, direct, question, respond, give feedback, and so on). Questions were further subdivided according to type (e.g. 'open' versus 'closed'). In relation to feedback, a distinction was made between 'elaborated' and 'non-elaborated'. Non-elaborated feedback involves simple repetition of a pupil response or a short reply (e.g. 'Okay'). Elaborated feedback involves a more extended response (the mean duration of elaborated feedback at Abbeyford was 13 seconds compared to 4 seconds for 'non-elaborated' feedback). The particular activity type within which these discourse moves were embedded was also noted (e.g. 'Recap', 'Review of group work', 'Introduce new task' and so on). In the way we set up the system, the software "stops" one move once another move is coded. Noticeable pauses between moves were coded as "silence". Because the start of every code is time-stamped, *The Observer XT* recorded the duration as well as the frequency of coded behaviours. Definitions for all of our coding categories can be found in Appendix A, and the coding process is represented diagrammatically in the flowchart in Appendix B.

Green, Dixon & Zarharlick (2005: 147) would recognise this methodology as belonging to a *closed* 'category systems' approach, 'in which all of the *variables* to be observed are defined a priori and the *data* are recorded by tallying occurrences of particular behaviors' (emphasis in original). However, in this study, we built flexibility into the system, adding codes at a later stage to reflect emergent phenomena in the video data, and also inserting free text comments in places where the code-data fit was less than perfect, or where we encountered phenomena worthy of revisiting. Further, the project as a whole incorporated what Green et al. refer to as *open* systems of classroom observation, including fieldnotes, collection of artefacts, audio and video recordings, and detailed transcripts of interaction, all of which contributed to the wider case study. At the end of this paper we briefly explore the advantages and disadvantages of systematic observation in relation to other methods for the study of classroom discourse and interaction (e.g. micro-analysis of lesson transcripts and video-recorded activity).

Findings

We discuss our findings according to three questions:

1. How does classroom practice observed compare to a national sample of literacy lessons?
2. To what extent, and in what ways, did classroom interactional patterns change over time?
3. Under what conditions did teaching and learning become more or less dialogic?

1. How does classroom practice observed compare to a recent national sample (of both average and highly effective teachers)?

In this section we compare our findings with a national sample of literacy lessons collected by researchers at the University of Newcastle in 2001 (Hardman et al. 2003). The aim of the Newcastle study was to investigate the impact of the National Literacy and Numeracy Strategies (and in particular their focus on 'interactive whole class teaching') on the interaction and discourse styles of primary teachers working across a range of settings within England (Smith & Hardman 2004). The national sample included 72 lessons divided equally between Reception, KS1 and KS2, of which 35 were literacy and 37 numeracy. 60 percent of these lessons were taught by teachers categorised as 'highly

[5] For a review of this software see Snell (2011).

effective'; the remaining 40 percent by 'average teachers'.[6] The table in Appendix D contrasts our computerised systematic observation data with findings from the Newcastle study. The numbers in the top half of the table show the 'rate' (i.e. number per hour) for teacher and pupil discourse moves. Rate is calculated as frequency per hour to make this data comparable to other studies. If, for example, a teacher used 5 open questions in 20 minutes of whole-class teaching, this would be reported as a rate per hour of 15. Rate is recorded for each individual teacher and for the school as a whole (i.e. the average for all 3 teachers), and this is compared with the averages reported by Hardman and colleagues for the 35 literacy lessons[7] included in their national sample (Hardman et al. 2003; Smith et al. 2004).

The table shows that teachers at Abbeyford Primary asker fewer closed questions than the teachers in the national sample, and instead adopted more dialogic inquiry, using more open questions (i.e. questions for which there is no single, predefined correct answer) and probes (where the teacher stays with the same pupil to extend their initial response). The percentages to the left of 'rate' show each question type as a percentage of total questions. While 50% of questions in the national sample were closed, only 34% of questions at Abbeyford Primary were of this type.[8]

It should be noted that there is not a one-to-one correlation between the categories adopted in our analysis and those used in the Newcastle study. For example, results from the Newcastle study did not differentiate between elaborated and non-elaborated feedback. Further, a number of teacher discourse moves in the Abbeyford Primary data were coded as 'response to pupil', a category not present in the analysis of the national sample. This category includes responses to pupil questions, but it also incorporates discourse moves which did not neatly fit into other categories (e.g. statements which were neither 'explain' nor 'feedback'), and which tended to fall outside of the canonical *Initiation-Response-Evaluation* (IRE) cycle[9]. The national study, in contrast, focused primarily on this three-part IRE exchange, and thus gathered data mainly on teachers' questions, corresponding pupil responses, and the evaluation given in response to answers. It is therefore not possible to ascertain whether discourse at Abbeyford Primary more consistently fell outside of conventional patterns, suggesting a difference in classroom culture between Abbeyford and the classrooms in the national sample, or whether the comparative prominence of the discourse category 'teacher response to pupil' at Abbeyford is attributable primarily to differences in the two studies' assumptions about the way classroom discourse is organised, and therefore to which categories were used and how they were applied.

The rate of 'pupil response to teacher' is higher at Abbeyford Primary than in the national sample. Overall, individual pupil contributions accounted for a greater percentage of whole-class teaching time at Abbeyford (32% compared to 25% in the national sample). There were a number of pupil moves at Abbeyford Primary that fell outside of the IRE cycle (e.g. pupil questions and pupil response to pupil). These 'spontaneous' pupil moves[10] occurred three times more often at Abbeyford Primary than in the national sample (though, again, this may partly be due to methodological differences). Overall, this analysis suggests that pupils were actively engaged in whole-class discussion. It is worth pointing out, however, that the view we get from the this particular approach to systematic

[6] This measure of 'effectiveness' was calculated using Performance Indicators in Primary Schools (PIPS) data provided by the Curriculum, Evaluation and Management (CEM) Centre at Durham University.

[7] No distinction is made between Reception/KS1/KS2 or between 'effective' versus 'average' teachers for the sub-sample of literacy lessons. This distinction is made only for the corpus as a whole (i.e. all 72 lessons).

[8] The proportion of open questions in both sets of data represents a considerable increase on the findings of the earlier ORACLE 1976 study, where open questions formed only 5% of all questioning (Galton et al. 1980: 87), and of the follow-up study in which 12.8% of questions asked in English lessons were open (Galton et al. 1999: 74).

[9] This is an instance where the coding system was responsive to data which deviated from expectations. New phenomena can be built into the system at any point, even after multiple observations have been completed (though redesign of the coding scheme during observations necessitates revisiting all previously coded observations in order to maintain consistency).

[10] The Newcastle study included a category for 'spontaneous contributions' but did not specify the nature of these discourse moves.

observation is that of the teacher, who looks out onto a classroom with lots of pupil activity. Had we focused on 'target' pupils (as Galton and colleagues (1980, 1999) did in their ORACLE study), coding for their individual activity throughout the whole-class teaching element, we might have found that individual pupils spent much of their time silent or off-task. This issue of individual pupil participation is highlighted in much of our micro-analysis of lesson segments (see e.g. Lefstein & Snell 2009, 2011a; Snell & Lefstein 2010).

These findings suggest that classroom interaction at Abbeyford is significantly more dialogic than in the national sample: discourse more frequently deviated from the largely monologic IRE format; teachers posed more open questions; and pupils participated more often and in less rigidly constrained ways. We attribute these differences to the school's participation in prior programmes designed to promote dialogic teaching (especially the Teaching through Dialogue intervention, in which all three teachers were active) and the Local Authority attention to classroom discourse and emphasis on whole class interactive teaching. In this regard, we should note that we have reason to believe that some of the prominent features of what we would consider to be the school's "signature pedagogy" (e.g. the relatively high rate of probe questions, punctuating whole class discussion with very brief opportunities to talk with a partner) appeared in other, younger teachers in our sample, who arrived at the school after the Teaching through Dialogue project was no longer active in the school.[11]

'Pace' (as operationalised by Hardman and colleagues) is a measure of rate per hour for *all* discourse moves (i.e. the sum of all teacher and pupil discourse moves divided by the total duration of the whole-class part of the lesson). The national study found greater pace (i.e. overall more discourse moves) in the lessons of 'effective' versus 'average' teachers. In fact, this was the only statistically significant difference between these two groups of teachers. Using the same measure, the average pace of lessons in Abbeyford Primary was over 30% faster than in the national sample, 623 compared to 469 for highly effective' teachers (the measure for 'average' teachers was 414). At least part of this difference may be accounted for by differences in methodology. In the Newcastle study, discourse moves were coded real time by a researcher who observed the lesson and simultaneously coded the interaction on a hand-held device. In our study, discourse was coded retrospectively, based on video-recordings of the lessons, which facilitates greater thoroughness in capturing discourse moves (in fact, we did often stop the video during coding to replay segments to double-check our coding). For further discussion of pace, and in particular, how such quantitative measurement relates to ethnographic experience, see Lefstein & Snell (accepted).

2. To what extent, and in what ways, did classroom interactional patterns change over time?

a. Key differences between the three teachers studied

In order to address the question of change over time we must first investigate any differences between the three teachers, at least as they appear in the initial observations. Despite their similarities in terms of age and teaching experience, each of the teachers started the programme with rather different discourse styles. Two key differences were in the number and type of questions asked and feedback given during whole-class teaching. For each teacher, the first two lesson observations included in the analysis were pre-intervention (i.e. before the first professional development workshop). Figures 1 to 5 are based on systematic discourse analysis of these first two lessons.

[11] Based on fieldnotes; systematic discourse analysis was not performed on these teachers' lessons.

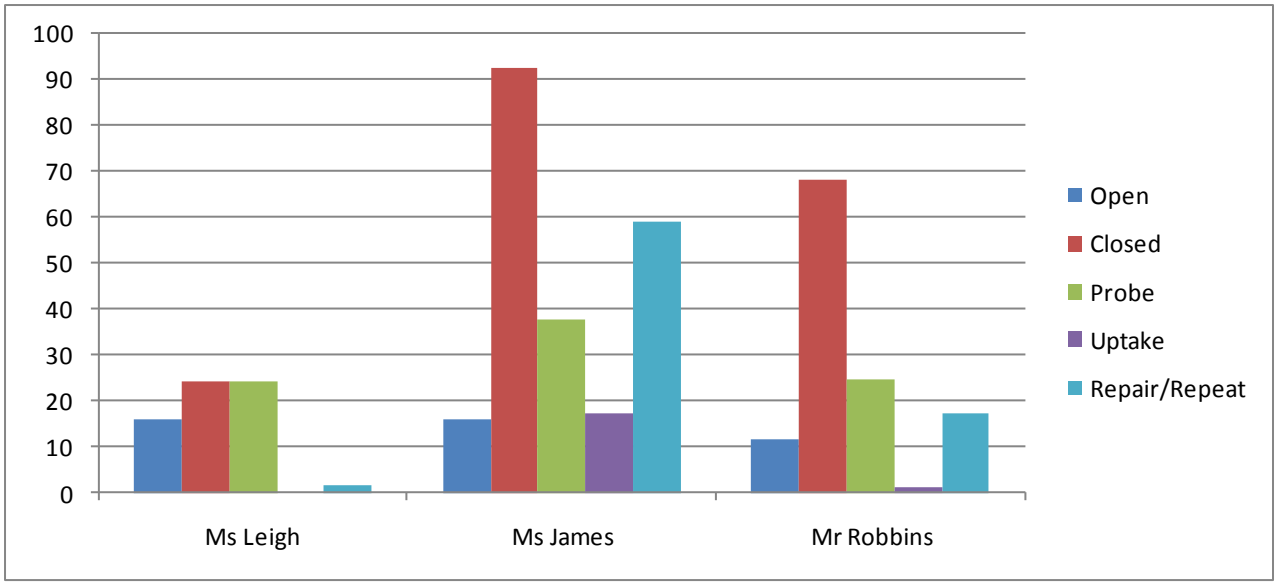


Figure 1: Rate per hour of teacher questions for Lessons 1 & 2

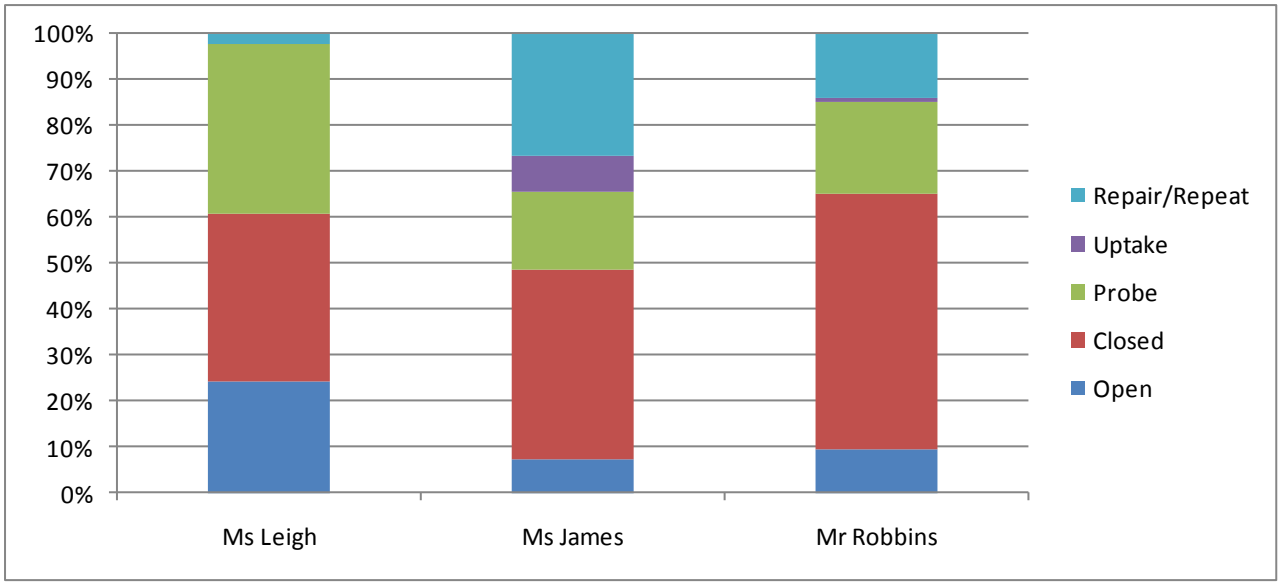


Figure 2: Question type as a percentage of total questions for Lessons 1 & 2

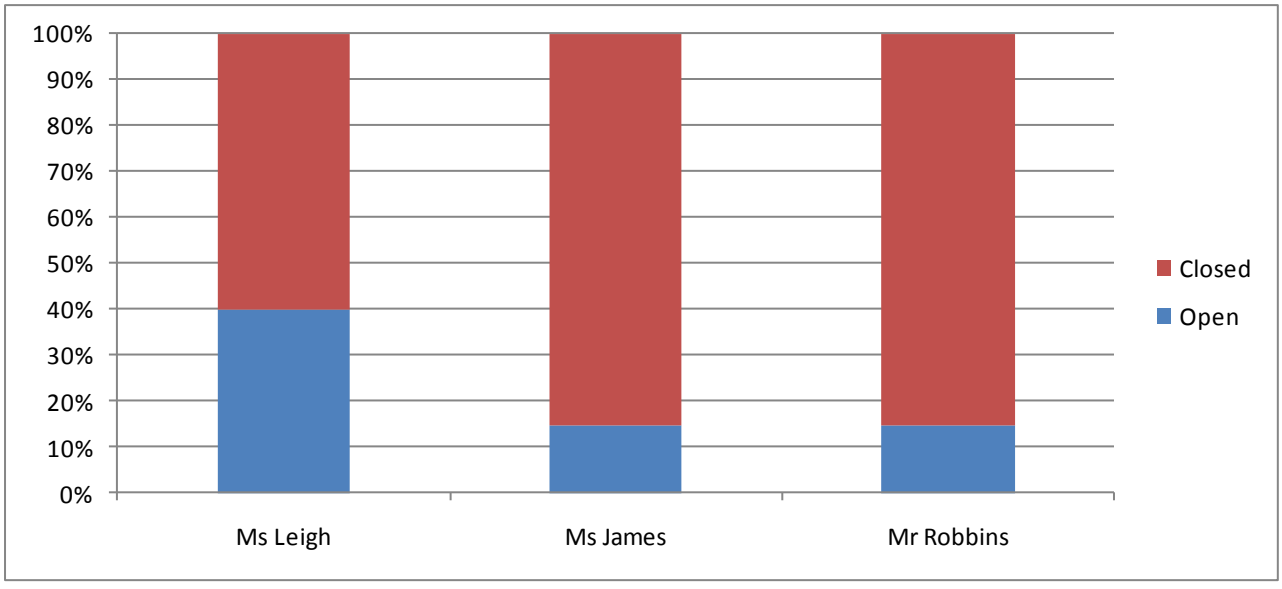


Figure 2: Ratio of open to closed questions for Lessons 1 & 2

Figure 1 shows the rate of all questions asked in the first two observed lessons (exc. procedural questions). It is evident that Ms. Leigh asked many fewer questions overall than Mr Robbins or (especially) Ms James. A key contrast between the teachers emerges, in particular, in relation to the number of closed questions asked: Ms James asked closed questions at an average rate of 87 compared to only 25 for Ms Leigh. Figure 2, which shows each question type as a percentage of total questions, highlights a clear difference between the teachers in terms of the type of questions asked. While the majority of questions asked in Ms Leigh's lessons were open questions and probes, closed questions and repair/repeat questions dominated the lessons of Ms James and Mr Robbins. Figure 3, which focuses on the ratio of open versus closed questions, reinforces this distinction.

Feedback which goes beyond simply evaluation or reformulation of a pupil's answer can draw out the significance of the answer to develop the individual pupil's thinking, as well as enhancing the understanding of his/her peers (Nassaji & Wells 2000; Nystrand et al. 1997). Figure 4 highlights that only in a few instances did the feedback move at Abbeyford Primary fulfil this role, and the majority of these cases were in Ms Leigh's classroom. For Ms James and Mr Robbins, the third move was dominated by non-elaborated feedback (Figure 5). Note that these teachers also used fewer probes than Ms Leigh (a question type designed to extend a pupil's answer and thus part of an elaborated feedback exchange). Ms. James did use a greater number of uptake questions, however, which aim to link an individual pupil's answer into the subsequent teaching exchange, and may thus be seen as development of the pupil's response (Figure 1).

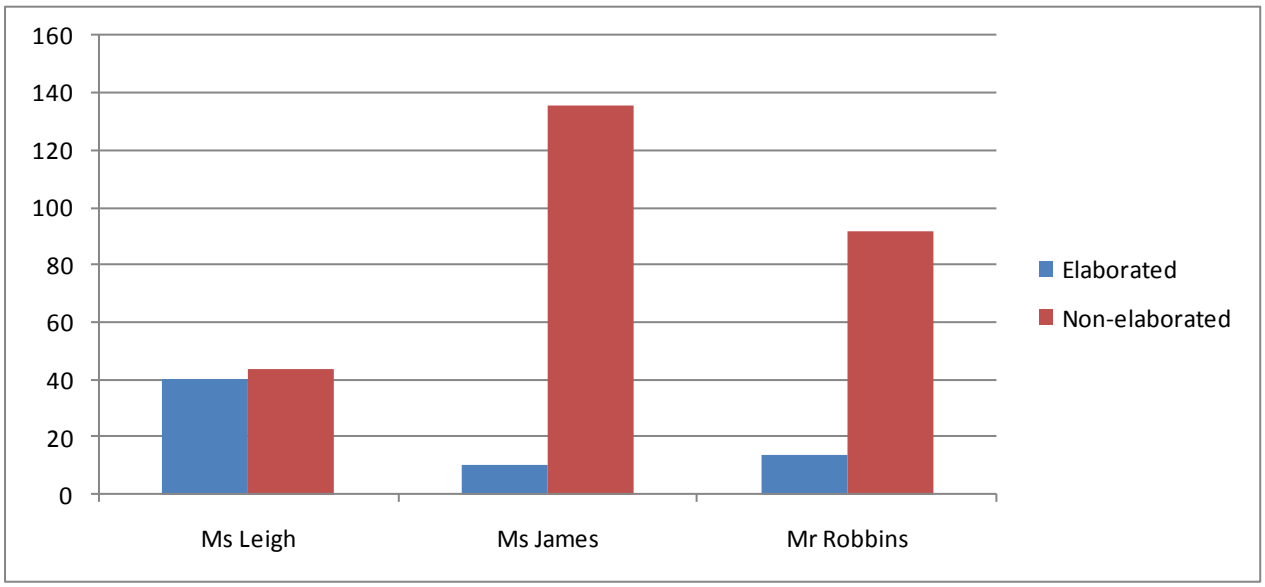


Figure 4: Rate per hour of teacher feedback

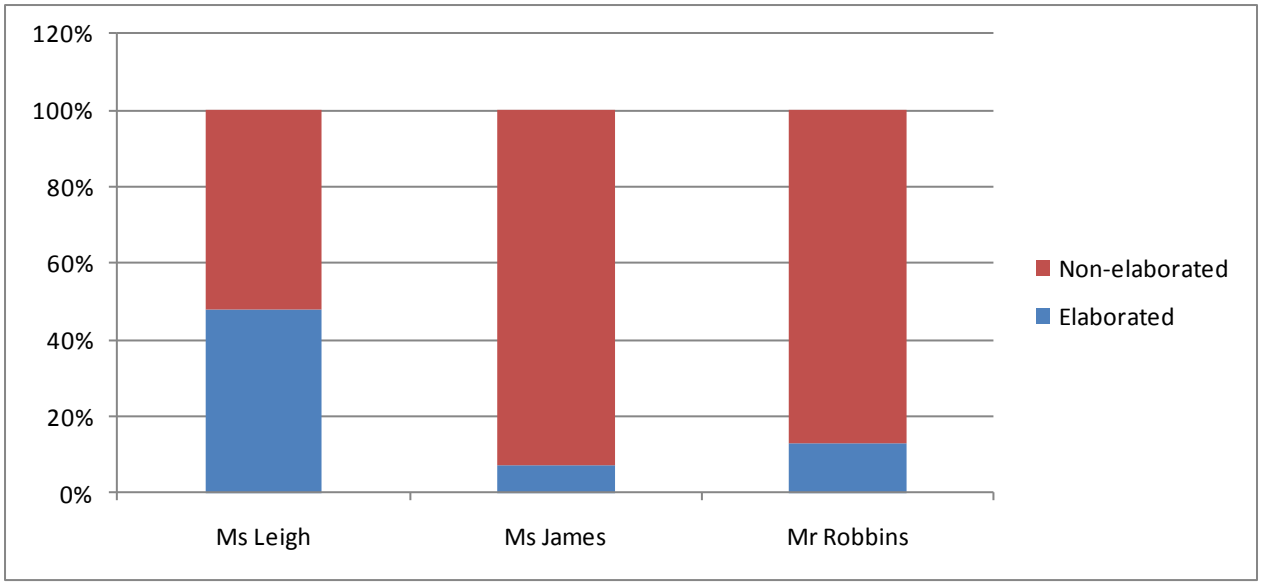


Figure 5: Rate per hour of teacher feedback

b. Given these differences in starting points, what changes happened for each teacher over time?

During the course of the intervention, all three teachers began to ask more open questions and fewer closed questions. The change over time is more marked for Ms James (Figure 7) and Mr Robbins (Figure 8) than for Ms Leigh (Figure 6), likely due to their different starting points.

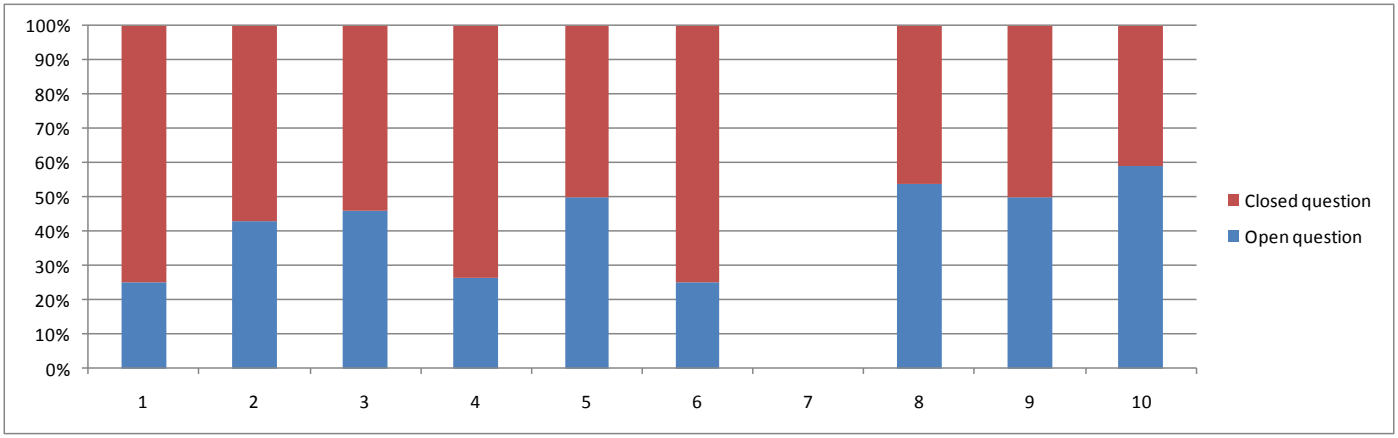
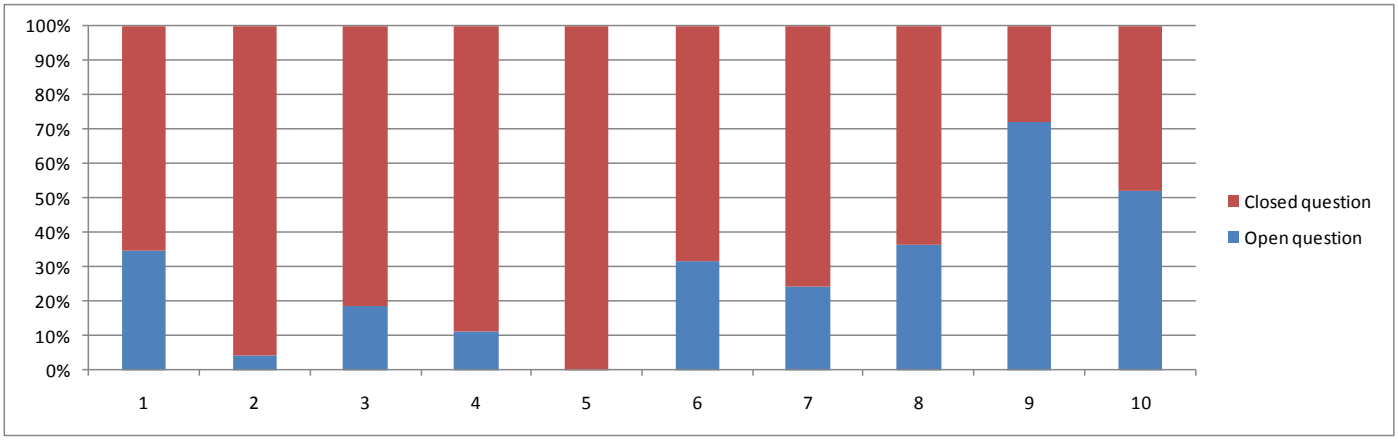


Figure 6: Change over time in the ratio of open to closed questions for Ms Leigh[12]



[12] Lesson 7 was dominated by pupil writing and the teacher discourse moves were directs and explanations.

Figure 7: Change over time in the ratio of open to closed questions for Ms James

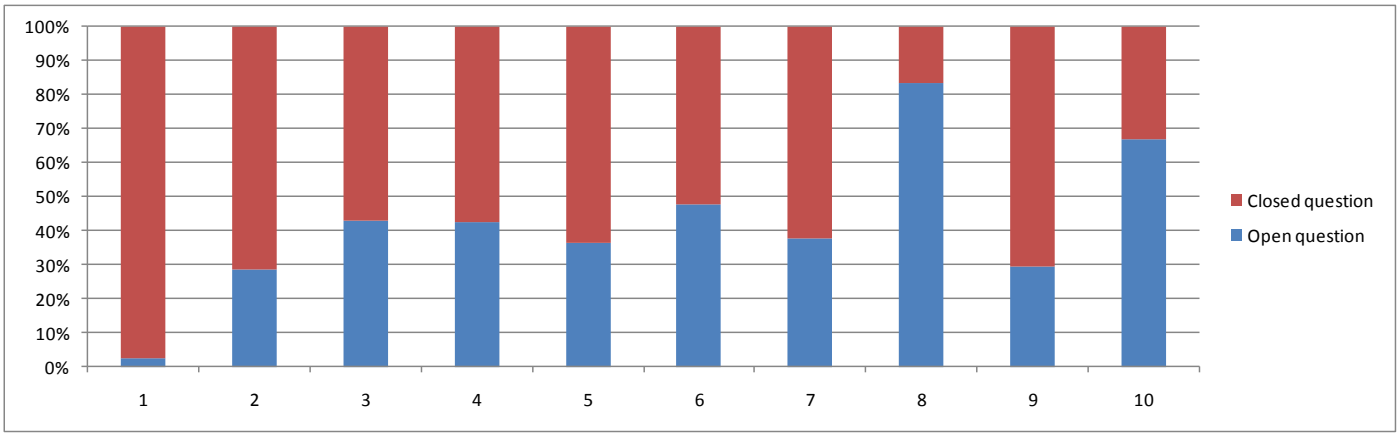


Figure 8: Change over time in the ratio of open to closed questions for Mr Robbins

No clear pattern emerged in terms of feedback (Figures 9 to 11). Notice that there is no elaborated feedback at all in lesson 5 of Ms James' class (Figure 10). This is not surprising given the character of the lesson, which was made up of the activities 'Introduce new topic' (70%), 'Introduce new task' (13%), and 'Recap' (17%). Similarly, the increase in elaborated feedback for Mr Robbins in lessons 1 and 10 can be explained in relation to activity type. The majority of Lesson 1 (56%) is taken up with the activity 'Review of pupil writing'.[13] This activity gives pupils the opportunity to read out their work and receive comments from the teacher; it therefore makes sense that Mr Robbins would offer more frequent than usual elaborated feedback. Lesson 10 involves discussion of a role play the pupils have just conducted of the trial from *The Highwayman*, a narrative poem they had been working on for several weeks. The impact of activity type/topic on the nature of classroom discussion is considered in greater detail below.

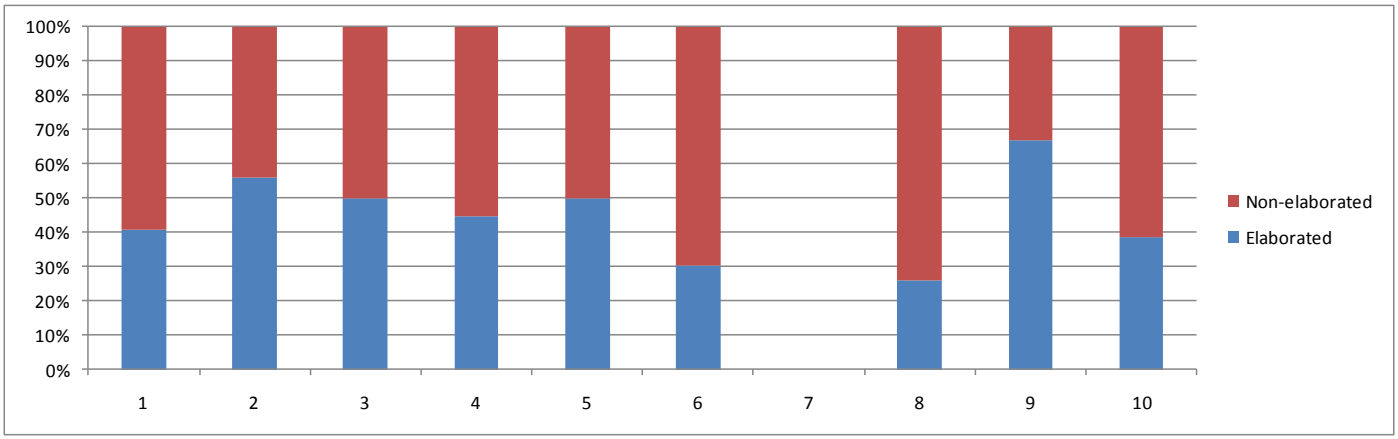


Figure 9: Change over time in the ratio of elaborated versus non-elaborated feedback for Ms Leigh

[13] The only other lessons this activity occurs in are Lesson 5 (27%) and Lesson 7 (46%), both of which contain greater than average elaborated feedback. Compare lesson 9 in Ms Leigh's class, where the activity types 'review of group work' and 'Review of pupil writing' correspond to a peak in elaborated neutral feedback.

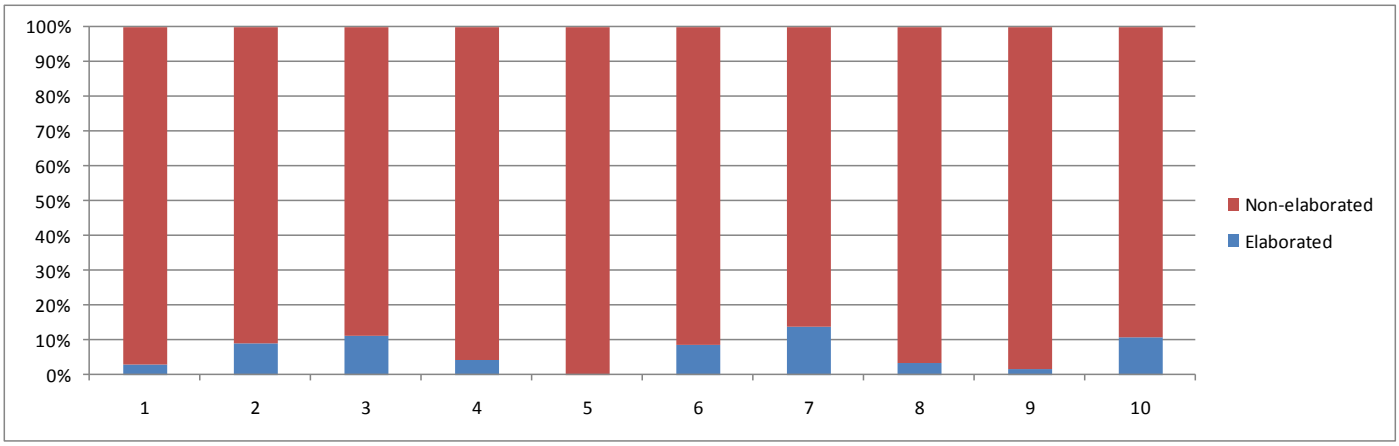


Figure 10: Change over time in the ratio of elaborated versus non-elaborated feedback for Ms James

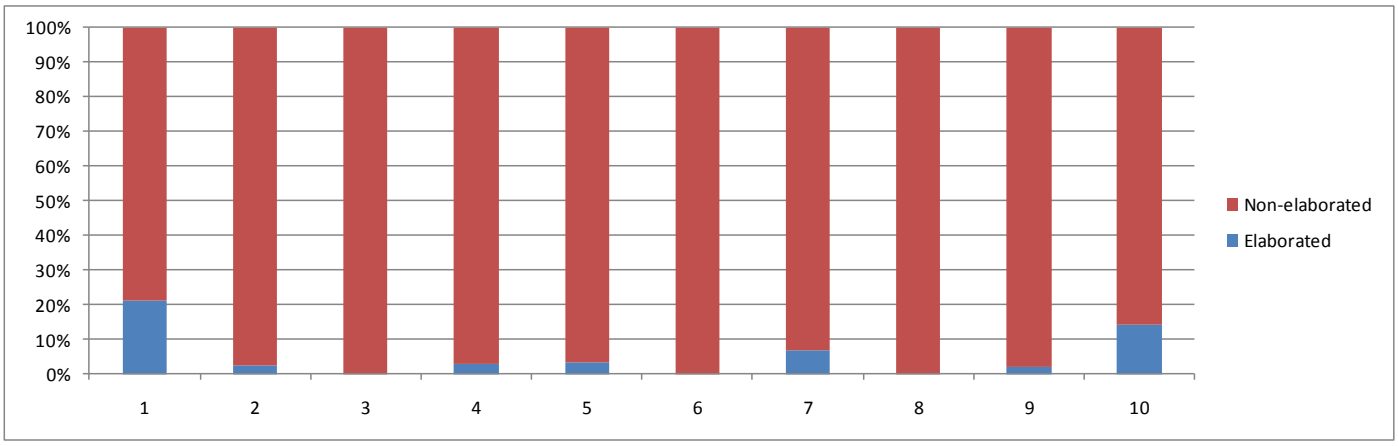


Figure 11: Change over time in the ratio of elaborated versus non-elaborated feedback for Mr Robbins

Feedback was also coded according to whether it was positive, negative or neutral. Figures 12 to 14 show a breakdown of both elaborated and non-elaborated feedback according to these distinctions for each teacher over time. Although they appear at first glance to paint a fairly confusing picture, what they show quite clearly, is the preference in Ms James' class for non-elaborated *positive* feedback compared to the preference for non-elaborated *neutral* feedback in Mr Robbins' classroom (a difference in classroom culture perhaps). This consistency in Mr Robbins' and Ms Leigh's classrooms stands in contrast to the variation in the feedback offered in Ms Leigh's lessons. This distinction between variety in Ms Leigh's classroom versus consistency in Mr Robbins' and Ms James' classrooms is a key theme that runs throughout the data.

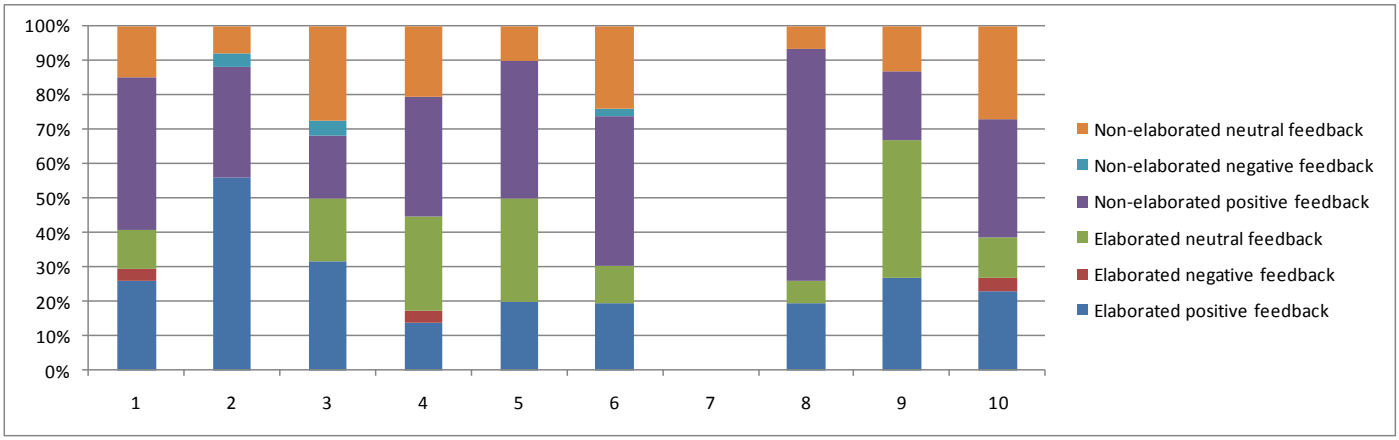


Figure 12: Type as a percentage of total feedback in Ms Leigh's lessons

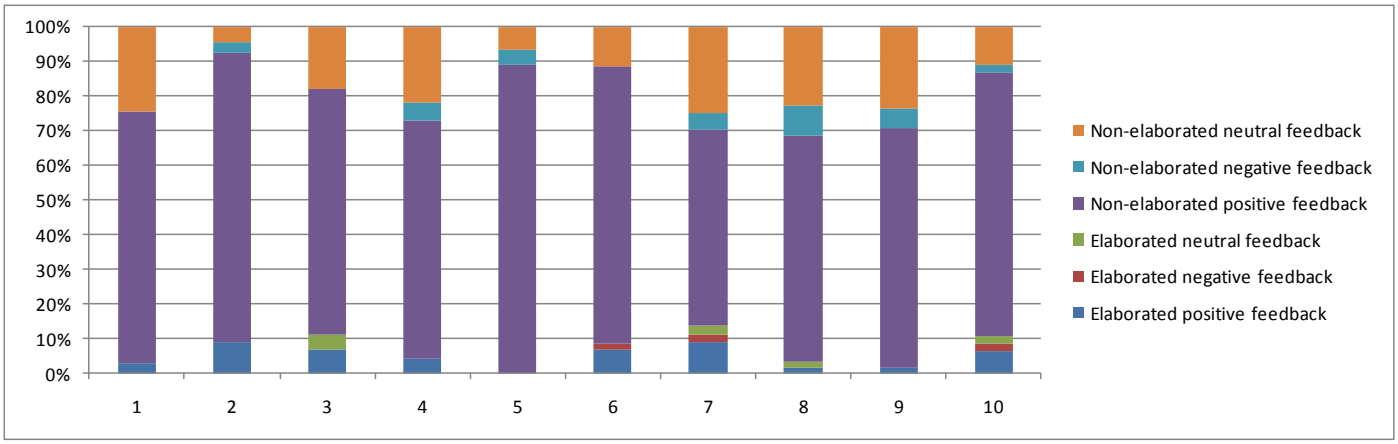


Figure 13: Type as a percentage of total feedback in Ms James' lessons

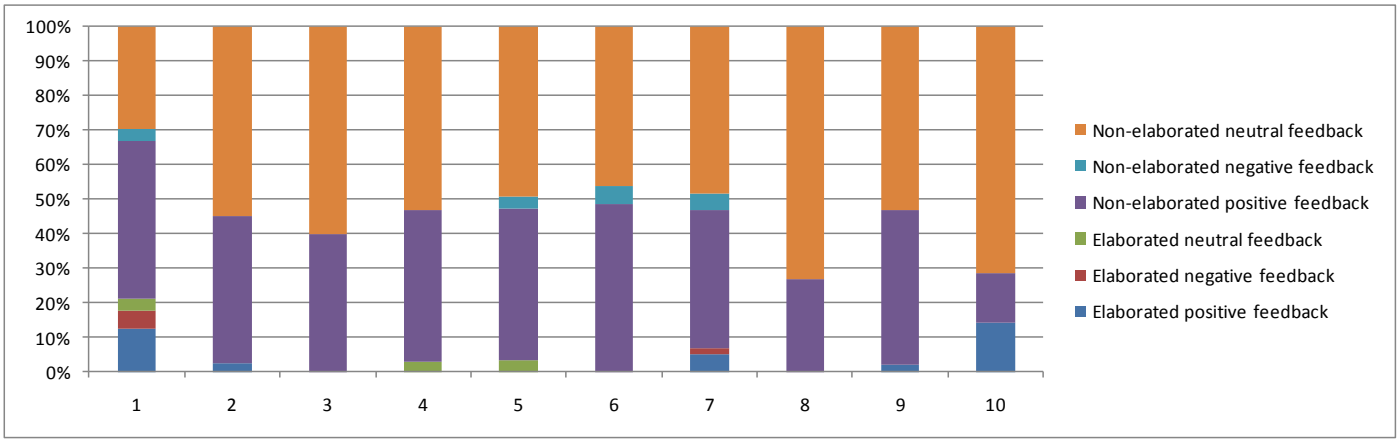


Figure 14: Type as a percentage of total feedback in Mr Robbins' lessons

The teachers' movement towards open questions and away from closed/test questions suggests a change in teaching practice towards more dialogic pedagogy. That this was the only notable change over time, however, raises the concern that this development was merely a 'bolt-on' to familiar practice (Galton 1999: 52) rather than an indicator of more penetrating and/or durable changes in teaching and learning.

3. Under what conditions did teaching and learning become more or less dialogic?

a. Explanation for changes in Ms. James' class: the Year 6 SATs tests

In February 2009, the Year 6 pupils at Abbeyford Primary began an intense period of revision for the SATs, which they were to sit in May 2009. The literacy lessons in observations 3 to 8 in Ms James' class were devoted entirely to revising for the English component of these tests. The lessons focused on different genres of writing (e.g. narrative, interviews, formal/informal letters, persuasive writing), and Ms James based her lessons on teaching materials provided by the Local Authority. Although the school had until recently been among the higher achieving schools in the Local Authority, as reflected in SATs scores, its position had slipped. For example, Abbeyford was ranked 5th out of 35 schools in the "league tables" comparing local schools in 2006, but fell to 29th in 2009. School management and teachers were under considerable pressure to reverse this downward trend, and success in the SAT tests and the upcoming OFSTED inspection were a major concern for all, but in particular, for the Year 6 teachers. During the majority of the observations, then, Ms James was under competing pressures: (1) to make changes to her teaching practice in line with our intervention; and (2) to prepare her pupils for the SATs, ensuring that individuals were able to perform to the best of their abilities, and that the school achieved an appropriate level of success overall. We were therefore interested to see if there were any differences in classroom discourse before, during and after the period of SATs revision.

Figure 15 shows the type of teacher questions asked in the lessons pre-, during, and post-SATs revision. SATs revision is very clearly marked by a high incidence of closed questions, while in the post SATs revision period, Ms James uses fewer closed questions and instead opts for more open questions and probes. Genuinely open questions give pupils the opportunity to go "off script", and this potential may not be welcomed by teachers who believe a more regimented approach is required for success in high stakes tests. Similarly, probes extend individual pupil responses, challenging them to develop their thinking, but may slow down the pace of the lesson in terms of the amount of material that can be covered (and time pressure is particularly acute during the SATs revision period) and in terms of the number of pupils who can contribute to the lesson, demonstrating their recall of the key features of different textual genres. It may be that, for Ms James, the potential benefits of making changes to her teaching practice in line with the intervention were outweighed by the clear and present threat to her and to the school of underachievement in the SATs (cf. Doyle & Ponder 1977, cited in Galton et al. 1999: 52).

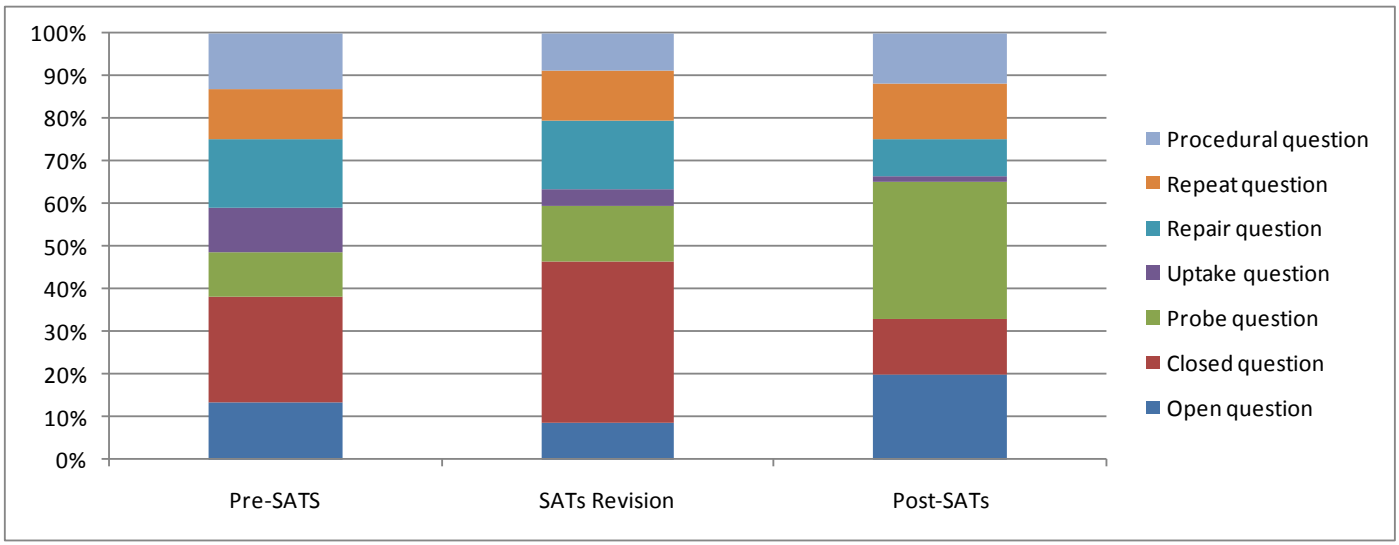


Figure 15: Type as a percentage of total questions in Ms James' lessons

b. Factors influencing changes toward dialogic practice: the contributions of activity, topic, and planning meetings

With the exception of the changes noted in open versus closed questions, the data did not pattern in any obvious ways; rather there were peaks and troughs in the frequency of occurrence of different discourse moves across the ten lessons. These peaks and troughs appear sporadic until the content of the lessons is taken into account, at which point the impact of activity type and topic becomes apparent.

The tables in Appendix E show the systematic observation data broken down by activity type. Table 1 aggregates the data for all three teachers. As we might expect, there are more closed questions in the activities 'Introduce new topic', 'Introduce new task' and 'Recap', teacher-led activities, which occupy the introductory element of whole-class teaching and have little room for exploratory talk. The most favourable ratio of open to closed questions comes in the less restricted activities 'Review of group work' and 'Feedback on pupil writing'. These two activities also enjoy a high level of pupil participation, again unsurprising given that these are pupil-focused activities. The activity 'Discuss texts' has the highest level of pupil participation overall (44%). This activity also has the highest proportion of probe questions (46%), and thus it seems that pupils were more often encouraged to give extended answers when discussing texts. 'Review of pupil writing' also had a high level of pupil participation (40%), and this activity was associated with greater elaborated feedback. We might have expected the collaborative activity 'Shared Writing' to share some of the dialogic discourse associated with 'Discuss texts', 'Review of group work/pupil writing' and 'Feedback on pupil writing', but this is not the case. During this activity, closed questions account for 38% of total questions and there's only 4% elaborated feedback. The breakdown between teachers (Tables 2-4) sheds some light on this. This activity occurred only in Mr Robbins' classroom, and his lessons overall were characterised by a greater than average frequency of closed questions and a low level of elaborated feedback.

It seems, then, that different activity types may be associated with different discourse styles, but these styles may not be shared by all teachers. Differences between activity types are most pronounced in Table 2, which focuses on the lessons of Ms. Leigh. During the activity 'Discuss Texts', 65 percent of Ms Leigh's questions were probes, and the ratio of teacher-to-pupil talk correspondingly tips in favour of pupils, with 63% pupil participation, significantly higher than for other activities. 'Review of group work' stands out for a favourable ratio of open to closed questions, and a high level of probes (see also Figure 18, which shows a similar tendency in Mr Robbins' classroom), and the activities 'Feedback on pupil writing' and 'Review of pupil writing' are marked for the very high level of elaborated feedback (77%). The differences between activity types in this classroom can be seen very clearly in Figure 16, which illustrates the way Ms Leigh's questioning strategy changes for each activity type. Compare this with Figure 17, which illustrates much greater consistency in Ms James' class (perhaps because of the constraints of the SATs). There is also little change across activity types in terms of pupil participation and feedback in Ms James' classroom.

Perhaps, then, different activity types are associated with changes in discourse, but only for certain teachers, or under only certain circumstances (e.g. when freed of the restrictions of standardised tests). Ms James' lessons do display the same association between 'Feedback on pupil writing' and open questions, which is evident in Ms Leigh's classroom, but this increase in open questions does not extend to 'Review of pupil writing'. 'Review of pupil writing' is a plenary session that follows a period of (usually individual) pupil writing. The aim of the teacher is generally to go around the class and acknowledge as many pupil contributions as possible, rather than giving formative feedback to individual pupils. 'Feedback on pupil writing' is where an individual's work becomes the focus for discussion and feedback for the class. 'Feedback on pupil writing' appears to be more 'dialogic' (at least in terms of open versus closed questions), but this activity was less frequent than 'Review of pupil writing'. The former activity only occurred once in Ms James' lessons, whereas the latter occurred four times, in lessons 2, 4, 6, 10. The activity 'Feedback on pupil writing' is also relatively infrequent compared to 'Review of pupil writing' in Ms Leigh's and Mr Robbins'

lessons.[14] In Ms Leigh's lessons, we do not see the same distinction in terms of open versus closed questions between the two types of activity, but 'Feedback on pupil writing' does appear to be more dialogic in relation to pupil discourse moves (e.g. pupil response to pupil and substantive pupil questions). This analysis raises questions about what might be the most effective way to provide feedback on pupil writing (and how feedback on an individual pupil's writing might incorporate whole-class participation and thus benefit all pupils). Again, though, differences between feedback activities are not constant across teachers. There appear to be differences in how activity type is interpreted by different teachers, or at least, how these interpretations translated into action.

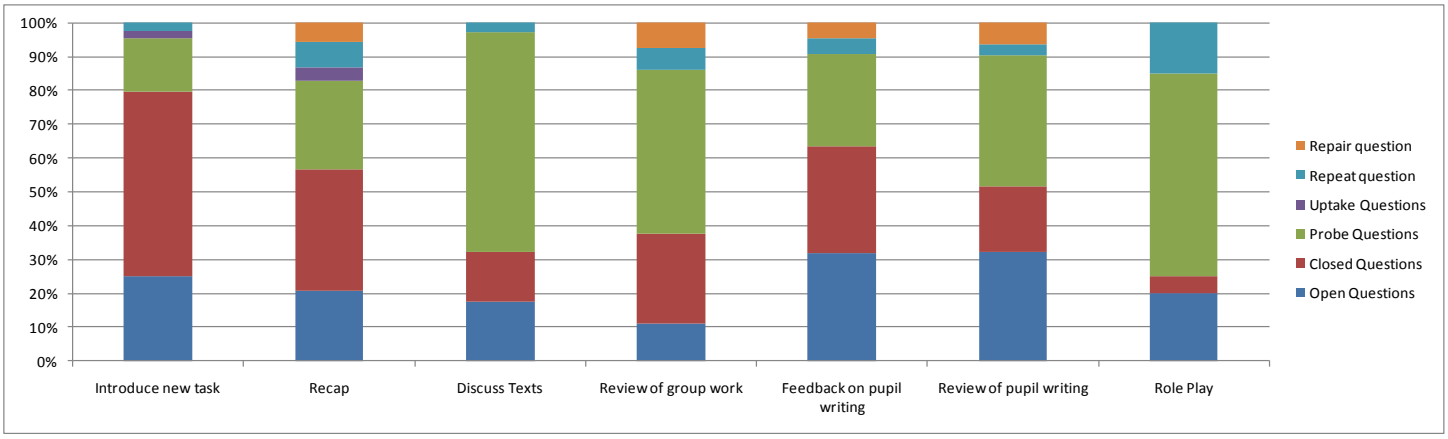


Figure 16: Type as a percentage of total questions in Ms Leigh's lessons (split by activity type)

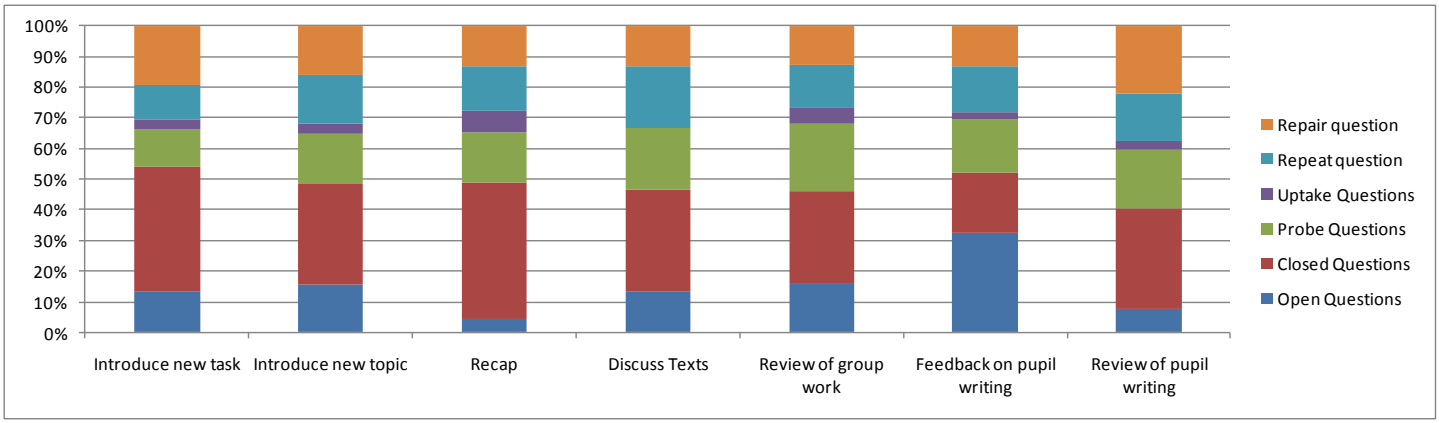


Figure 17: Type as a percentage of total questions in Ms James' lessons (split by activity type)

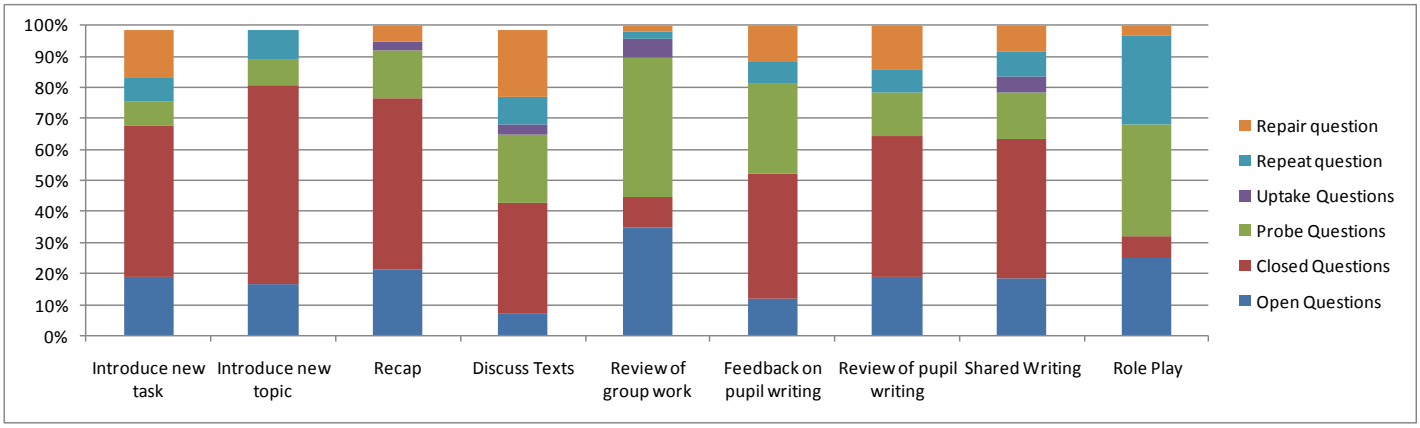


Figure 18: Type as a percentage of total questions in Mr Robbins' lessons (split by activity type)

[14] For Ms Leigh, 'Feedback on pupil writing' occurs only in lessons 3 and 6, but 'Review of Pupil writing' occurs in lessons 2, 3, 7, 8, and 9. For Mr James, 'Feedback on pupil writing' occurs only in lesson 2, but 'Review of pupil writing' occurs in lessons 1, 2, 5, and 7.

The relationship between discourse style and activity type helps to explain the ways in which discourse moves patterned across the ten lessons. For example, Figure 19 shows that the rate of probe questions in Ms Leigh's classroom peaked in lessons 4 and 5, but then returned to something much closer to the average (around 54, represented by the line on the graph) in the following lessons. These were the only two lessons to include the activity 'Discuss Texts'. In lesson 5, 'Discuss texts' takes up 70% of the whole-class teaching in this lesson (made up of a discussion of themes in *Charlotte's Web*); in lesson 4 it accounts for only 14%, but 'Recap' takes up 41%, and this involves an extended recap of *Charlotte's Web* (following a break because of a one day absence from school due to heavy snow), and thus functions as discussion of a text[15]. Similar fluctuations take place over Mr Robbins' lessons (Figure 20). There is a greater than average rate of probes in lessons 3 and 4. Both of these lessons involve the activity 'Discuss Texts' (lesson 9 is the only other lesson to include this activity). Moreover, these discussions are of *Charlotte's Web* (these are the only two *Charlotte's Web* lessons captured by the SDA). The unit of work on *Charlotte's Web* was planned by the Year 5 teachers in collaboration with us, and appeared to be a great success (based on comments made by the teachers during reflection workshops and informally in the staffroom, our own lesson observations, and feedback the pupils gave in a focus group discussion).

A second unit of work we planned with the teachers was based on the narrative poem *The Highwayman.* One of our suggestions was that the children recreate the trial using role play and their knowledge of the text. The tenth observation in Mr Robbins' class captures the class discussion that came after this role play, and is marked by a very high rate of probes (Figure 20) and a higher than average rate of open questions (43, compared to an average in this classroom of 22). It is possible, then, that while our intervention did not appear to bring about steady change over time in classroom interaction, our contribution to lesson planning did impact the kinds of activities used in some lessons and the corresponding discourse style.

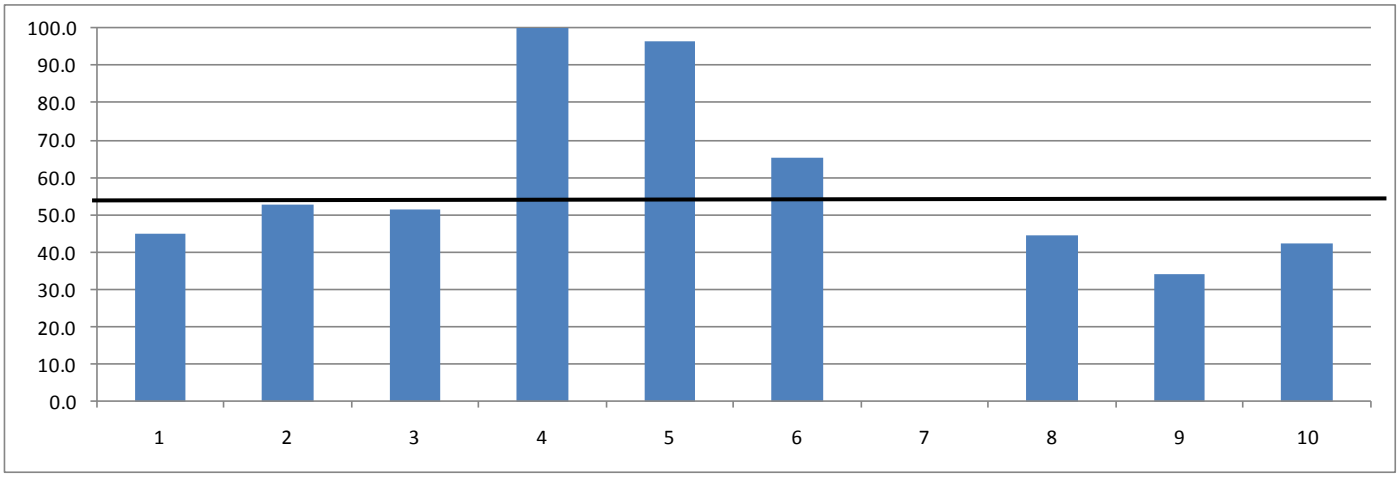


Figure 19: Changes over time in rate of probe questions in Ms Leigh's classroom

[15] This 'Recap' activity was highlighted as an extract for micro-analysis (see Section X) because of the high number of probes and teacher challenges amongst other things

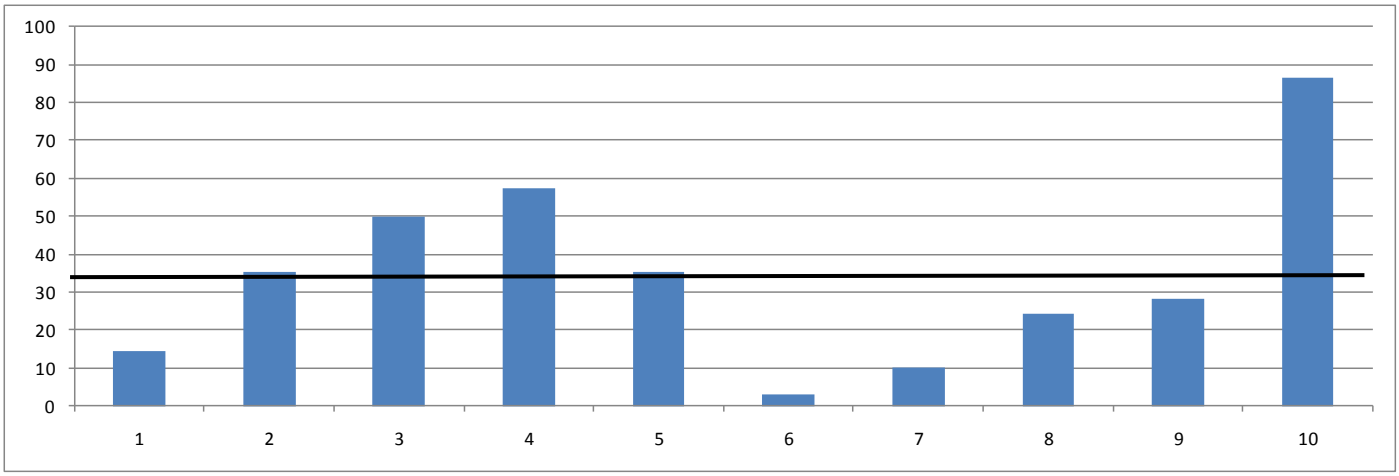


Figure 20: Changes over time in rate of probe questions in Mr Robbins' classroom

The relationship between discourse style and activity type also casts further light on the dramatic change in Ms James' post-SATS revision lessons (i.e. lessons 9 and 10), which have many more open questions and many fewer closed questions than previous lessons (Figures 7 and 15). For example, lesson 10 is the only lesson to include the activity 'Feedback on pupil writing' (50% of lesson), an activity type which has been shown to have the most open questions overall (see tables in Appendix E). Lessons 9 and 10 were also based on the topic of recycling, which several of the pupils in this class were extremely enthusiastic about.[16]

Conclusion and some reflections on methodology

Systematic observation software like *The Observer XT* [17] are designed to extract operational variables from live action or video data, allocating observed behaviour to predefined categories. Once the scheme is set up, coding can be done relatively quickly (near to real-time), and much more efficiently than transcribing the same amount of data; so the speed with which one can interrogate a relatively large corpus of data is an advantage. Like transcriptions, coded data act as an intermediate representation of the raw video recordings (which are themselves of course a representation of the recorded activity). In this project, systematic observation provided an overview of the data and facilitated the identification of patterns within and across events (cf. Derry et al. 2010:, pp 8, 18). One of the aims of the research was to identify changes over time in classroom discourse, with particular emphasis on the transition to dialogic teaching and learning. Systematic observation and the subsequent quantitative analysis was used to highlight indicators of this transition, such as an increased incidence of teacher open questions across a series of lessons. This analysis also drew attention to differences in interactional patterns between classrooms, identifying classrooms that contained more dialogic discourse moves (e.g. teacher open questions, pupil challenges, pupil-pupil interaction). As such, systematic observation provided relatively objective criteria for comparing classrooms (cf. Galton, Croll, & Simon 1980: 172-173; Westgate & Hughes 1997:.128).

For some scholars, objectivity is a key advantage of systematic observation methods. Galton et. al. 1980: 172-173) write that such methods

> involve the development of unambiguous criteria for assigning events into categories so that different observers are basing their responses on a common observation system...Unlike descriptions which are not based on reliable

[16] This interest is evident in the high rate of substantive pupil questions in lesson 9 (13 compared to an average across all 10 lessons of 4).

[17] Parts of this section were previously published as Snell (2011), which also includes a detailed review of the The Observer XT software package.

> schedules the basis for the response is fully explicit. Consequently anyone reading the description knows exactly how it was arrived at. The reader may disagree with the definition and criteria employed, but he knows exactly what they are, and he knows that the results are unaffected by the personal idiosyncrasies of the observer. *It is in this limited but crucial sense that systematic techniques may be called objective* (our emphasis).

To a certain extent, however, even this limited sense of objectivity must be questioned. The criteria for assigning utterances to categories may be unambiguous, but the utterances themselves are often open to multiple interpretations. Further, distinctions between coding categories can be difficult to operationalise. For example, a question that appears to be open in real time (because it seems that the teacher does not have a prespecified answer in mind) and is coded as such, may later be recontextualised as closed (e.g. following a series of rejected pupil responses, where it becomes clear that the teacher is looking for one particular answer). Conversely, a straightforward closed/test question may be opened up several turns later by an inquisitive pupil. In such cases, the way a discourse move is coded may well come down to 'the personal idiosyncrasies' of the researcher, and when that researcher is also a participant observer (as was the case in this project), coding decisions are likely to be influenced by personal knowledge of the teacher, pupils and classroom environment.

A criticism often levied at systematic observation systems overall is that they are reductionist: the complexity of the classroom is reduced to a series of decontextualised discourse moves. This is where the project incorporated complementary qualitative analyses to explore issues systematic observation opened up. For example, substantive pupil questions are infrequent across the corpus as a whole (an average rate of 8 per hour), but occur frequently in the whole-class teaching component of one particular lesson (Lesson 3) taught by Ms. Leigh (a rate of 30 per hour, compared to an average of 5 across other lessons in Ms. Leigh's class). There was also a high incidence of other dialogic discourse moves in this lesson, like open questions and pupil-pupil discourse moves. This episode was therefore highlighted for further investigation. From a corpus of 30 hours, a relatively short (12 minute) segment is thus isolated for transcription followed by detailed micro-ethnographic and multi-modal analysis (for the results of this analysis, see Lefstein & Snell 2011a). In this way, it's possible to highlight a particular activity, pedagogic technique or use of technology that had a significant impact on classroom talk in one particular episode, resulting in the generation of further hypotheses that can then be tested on the corpus as a whole. Systematic analysis is useful not only in selecting episodes for further analysis, but also in giving a sense of how typical or atypical that event is relative to the larger corpus (see e.g. Lefstein & Snell 2011: 43-45). Related events can be identified quickly if the data has been coded using a programme like *The Observer*, where coded behaviours are recorded in an 'event log', which is time-stamped and linked to the relevant video file. Systematic observation software is thus a powerful tool for archiving and managing large data sets.

In this project, combining systematic observation with more open, ethnographically-informed methods led to a productive cycle of generating and testing hypotheses. Overall, the systematic observation data has indicated that a variety of factors interact in influencing classroom discourse: lesson topic; the activity type used to explore that topic; and the wider educational/institutional frameworks within which the activity is embedded. Micro-analysis of extracts from lessons and professional development workshops, combined with analysis of artefacts (including pupil writing) have enabled us to explore these factors in more depth.

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Appendix A: Definitions of Coding Categories

Discourse moves

Question: 'any utterance which seeks an answer' (Galton et al. 1980: 85-86). This includes utterances which are in the imperative form (e.g. "Tell me more", "Give me one thing that is good enough in there") but function as elicitations.

Substantive/procedural questions:- 'Procedural' includes questions about matters of classroom routine or task organisation as well as rhetorical and discourse management questions (Nystrand et al 1997, 2003). Discourse management questions include e.g. "Do you want me to come back to you?" It is assumed that procedural questions will always be closed; they are thus not categorised further.

Open question: A question for which it doesn't seem that the teacher has a prespecified answer in mind.

Closed question: A question for which there are a limited range of prespecified acceptable answers.

Probe: A follow-up question designed to extend an individual pupil's response.

Uptake question: A follow-up question in which the teacher incorporates a pupil's answer into a subsequent question directed to the whole class.

*Repair***:** The speaker repeats or reformulates their question without giving their addressee(s) chance to answer.

Repeat: The speaker repeats/reformulates the same question after receiving no response or an unacceptable response.

*Direct***:** An instruction to do something

Explain: Explanation of a topic, task or concept.

Challenge: Teacher/pupil explicitly challenges another participant's response/view.

*Non-elaborated feedback***:** Includes short responses which evaluate an answer (e.g. 'excellent', 'not quite', 'okay'), repetition and minimal reformulation (i.e. reformulation which stays true to pupil response) of pupil responses.

Elaborated feedback: More than just 'good', 'okay' or simple repetition/reformulation of student response; an extended response for the benefit of individual pupil or whole-class learning.

*Teacher Response to pupil***:** In addition to teacher responses to pupil questions, this category includes teacher utterances which do not fit neatly into other categories and tend to fall outside of the canonical IRF exchange e.g. statements which are neither 'explain' nor feedback'.

Pupil Response to pupil: A pupil directly addresses another pupil during classroom discussion. Sometimes a pupil responds to something another pupil has said by directly addressing the teacher (in terms of gaze etc.) and by referring to the pupil in the third person. Such utterances are coded as 'response to teacher'.

Pupil Response to Teacher: Pupil response to teacher question or direct. Responses can be non-verbal, as when pupils raise their hands following a question such as *How many of you agree with Tara?*

*Call out***:** An unsolicited (and often unacknowledged) contribution from a pupil

Activity Types

Discuss texts: Discussion is centred on a text that the pupils are reading (e.g. *Charlotte's Web*). The teacher typically asks questions to explore and extend the pupils' understanding of the text.

Introduce new task: The class are working on a topic/unit of work that has already been introduced, but are moving onto a new task.

Introduce new topic: The teacher introduces a new topic/unit of work.

*Recap***:** Review of work covered earlier in the lesson or (more usually) from a previous lesson to ensure that all pupils have access to the knowledge required to move on.

Review of pair/group work: Pupils have been asked to work together with other pupils to brainstorm, discuss a question, review each other's work, and so on. The teacher then asks individual pupils / groups to report back to the whole group

Review of pupil writing: Plenary session that follows a period of (usually individual) pupil writing. The teacher generally acknowledges as many pupil contributions as possible.

Feedback on pupil writing: An individual's work becomes the focus for discussion and feedback for the class. Often (though not always) the work is displayed on the whiteboard or via handouts so that all pupils have access to it. And usually, feedback comes from pupils as well as the teacher.

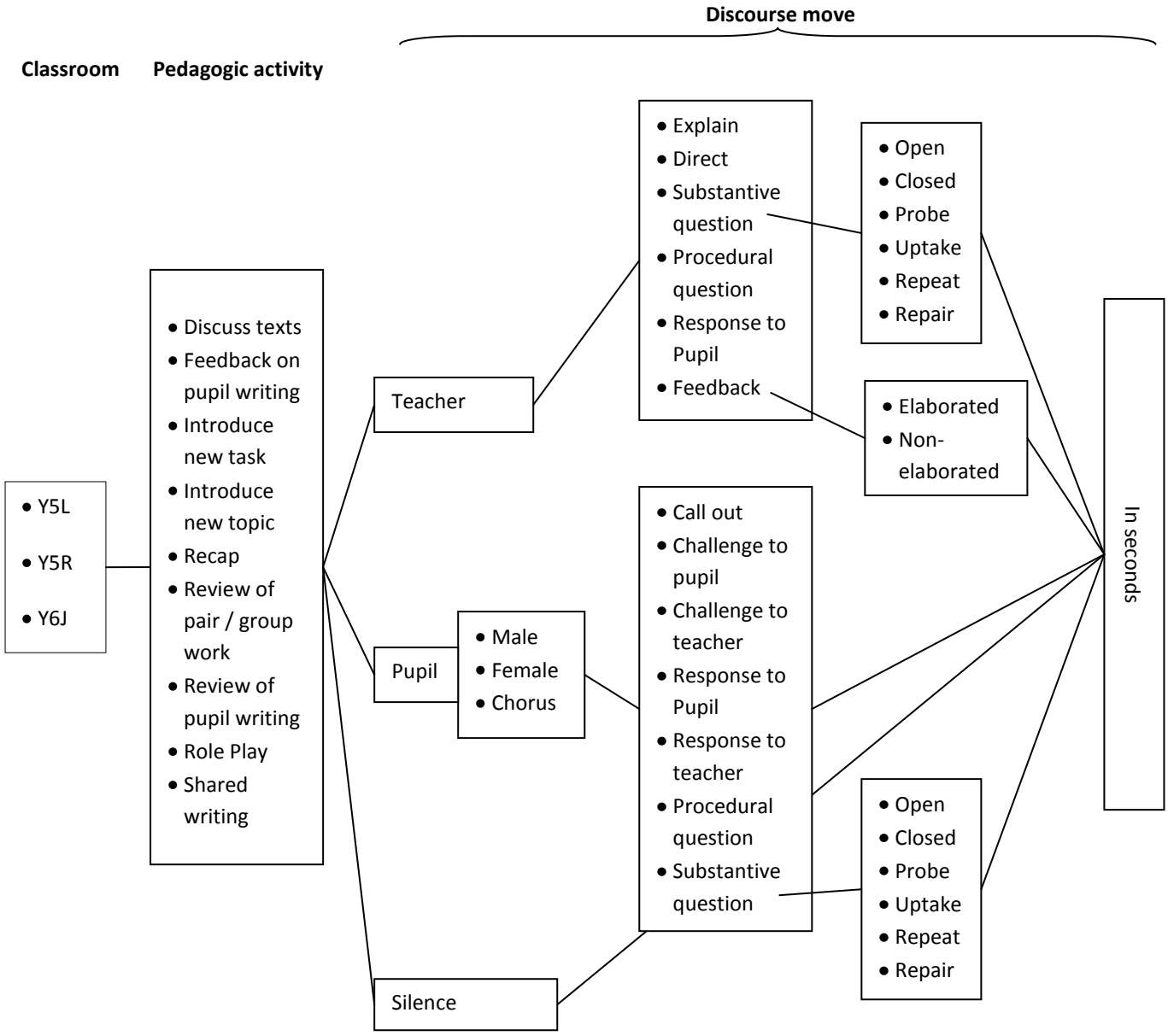
Shared writing: The class share the writing process (e.g. pupils offer contributions and the teacher writes them up into a text displayed on the whiteboard)

Role Play: Pupils (and sometimes the teacher) take on the persona of different characters (perhaps from the text they are reading).

NB: there could be overlap between activities e.g. in situations where groups have been tasked with discussing questions related to a text, the resulting plenary could fall under 'review group work' or 'discuss texts'.

Appendix B

Systematic Discourse Analysis categories and codes



Appendix C: Lesson Observations

Teacher 1 (Ms Leigh):

Date of Observation	26th Nov 2008	7th Jan 2009	16th Jan 2009	4th Feb 2009	4th Mar 2009	31st Mar 2009	29th Apr 2009	7th May 2009	5th Jun 2009	17th Jun 2009	Average
Lesson length (minutes)	41	62	54	38	57	65	38	49	34	48	**49**
Whole-class element (minutes)	20	17	33	18	16	43	8	16	21	32	**22**
Percentage whole-class teaching	48%	28%	61%	46%	27%	67%	20%	33%	61%	67%	**46%**

Teacher 2 (Ms James):

Date of Observation	28th Nov 2008	12th Jan 2009	4th Feb 2009	23rd Feb 2009	2nd Mar 2009	11th Mar 2009	18th Mar 2009	7th May 2009	5th Jun 2009	22nd Jun 2009	Average
Lesson length (minutes)	49	44	51	47	43	52	53	50	57	49	**50**
Whole-class element (minutes)	15	26	22	31	15	33	28	32	38	22	**26**
Percentage whole-class teaching	31%	60%	43%	66%	35%	62%	52%	65%	66%	44%	**53%**

Teacher 3 (Mr Robbins):

Date of Observation	17th Dec 2008	12th Jan 2009	11th Feb 2009	4th Mar 2009	18th Mar 2009	27th Apr 2009	28th Apr 2009	3rd Jun 2009	17th Jun 2009	9th Jul 2009	Average
Lesson length (minutes)	58	57	40	39	38	56	59	24	53	34	**46**
Whole-class element (minutes)	29	27	18	20	27	40	41	10	21	6	**24**
Percentage whole-class teaching	50%	48%	45%	51%	72%	71%	70%	42%	40%	16%	**52%**

Appendix D

		Teacher 1		Teacher 2		Teacher 3		School Average		National Sample
LESSONS SAMPLED		**10**		**10**		**10**		**30**		**35**
TOTAL WHOLE-CLASS TEACHING SAMPLED (mins)		**224**		**262**		**244**		**729**		
MEAN DURATION LESSON (mins)		**49**		**50**		**46**		**48**		**53**
MEAN DURATION WHOLE-CLASS TEACHING (mins)		**22**		**26**		**24**		**24**		**32**
MEAN PERCENTAGE WHOLE-CLASS TEACHING		**45%**		**52%**		**52%**		**50%**		**60%**
RATE PER HOUR										
Teacher										
	Explain		35		61		33		44	52
	Direct		49		32		46		42	43[18]
	Open Questions	*20%*	16	*14%*	29	*18%*	19	*16%*	22	*13%* 15
	Closed Questions	*30%*	24	*35%*	71	*36%*	37	*34%*	46	*50%* 58
	Probe Questions	*38%*	31	*17%*	34	*26%*	27	*23%*	31	*17%* 19
	Uptake Questions	*1%*	1	*4%*	9	*3%*	3	*3%*	5	*7%* 8
	Repeat question	*6%*	5	*14%*	29	*7%*	8	*11%*	14	*13%* 15
	Repair question	*5%*	4	*16%*	33	*9%*	9	*12%*	16	*0%*
	Total Questions									
	Challenge to pupil		2		3		1		2	
	Response to Pupil		40		49		22		37	
	Elaborated Feedback	*42%*	26	*6%*	8	*6%*	5	*13%*	13	
	Non-elaborated Feedback	*58%*	36	*94%*	116	*94%*	90	*87%*	83	
	Total Feedback		**62**		**124**		**95**		**95**	**65**
Pupil										
	Call out		3		13		14		10	
	Challenge to pupil		0		0		1		0	
	Challenge to teacher		1		0		0		0	
	Substantive question		5		5		14		8	
	Response to Pupil		11		2		20		11	
	Total "Spontaneous Contribution"		**21**		**19**		**49**		**30**	**10**
	Read aloud/pupil presentation		12		11		14		13	11
	Response to Teacher		145		200		158		169	120
	Choral response		19		52		15		24	9
AVERAGE DURATION (seconds)										
Teacher										
	Explain		30		18		18		21	23
	Direct		6		3		5		5	15
	Open Questions		4		3		5		4	7
	Closed Questions		3		3		5		4	5
	Probe Questions		3		2		3		3	4
	Uptake Questions		6		4		5		4	5
	Elaborated Feedback		13		14		13		13	
	Non-elaborated Feedback		3		4		3		4	
	Total Feedback		**7**		**4**		**4**		**5**	**6**
Pupil										
	Response to teacher		6		3		6		5	5
PERCENTAGE PUPIL CONTRIBUTION (DURATION)			32%		23%		41%		32%	25%
PACE			498		772		578		623	469[19]

[18] Integrates Smith & Hardman's categories of 'direct' and 'refocus'

[19] For 'highly effective' teachers. The measure for 'average' teachers was 414.

Appendix E

Table 1: Discourse moves by activity Type – All three teachers

	Introduce new topic		Introduce new task		Recap		Discuss Texts		Review of group work		Feedback on pupil writing		Review of pupil writing		Shared Writing	
DURATION WHOLE-CLASS TEACHING SAMPLED (mins)		**75**		**148**		**83**		**46**		**166**		**45**		**88**		**26**
RATE PER HOUR																
Teacher																
Explain		58.7		66.3		45.1		26.2		40.2		30.9		29.9		25.4
Direct		28.9		38.2		22.5		37.9		46.7		45.6		62.4		27.7
Open Questions	*18%*	29.7	*15%*	15.0	*14%*	21.8	*10%*	17.0	*15%*	25.3	*22%*	36.2	*13%*	12.9	*15%*	25.4
Closed Questions	*42%*	68.3	*44%*	44.7	*41%*	65.4	*24%*	39.3	*24%*	40.5	*27%*	44.3	*40%*	38.7	*38%*	62.3
Probe Questions	*19%*	31.4	*13%*	13.4	*20%*	32.0	*46%*	77.2	*29%*	47.4	*21%*	34.9	*22%*	21.0	*13%*	20.8
Uptake Questions	*3%*	5.6	*3%*	2.8	*5%*	8.0	*2%*	2.6	*3%*	5.8	*1%*	1.3	*4%*	4.1	*4%*	6.9
Repeat question	*18%*	28.9	*9%*	9.3	*11%*	17.4	*7%*	11.8	*10%*	15.9	*9%*	14.8	*8%*	7.5	*7%*	11.5
Repair question	*0%*	0.0	*16%*	15.9	*10%*	16.0	*11%*	18.3	*9%*	15.2	*10%*	16.1	*14%*	13.6	*7%*	11.5
Challenge to pupil		0.0		0.0		0.0		0.0		1.4		0.0		0.0		2.3
Response to Pupil		65.9		26.8		29.8		24.9		47.1		29.5		33.3		18.5
Elaborated Feedback	*7%*	8.8	*8%*	6.9	*16%*	17.4	*2%*	7.9	*13%*	11.6	*20%*	17.4	*25%*	25.8	*4%*	4.6
Non-elaborated Feedback	*93%*	121.4	*92%*	75.6	*84%*	91.6	*98%*	493.6	*87%*	77.5	*80%*	69.8	*75%*	77.4	*96%*	108.5
Individual Pupil																
Call out		16.1		6.9		4.4		15.7		10.1		5.4		8.8		34.6
Challenge to pupil		0.0		0.0		0.0		0.0		0.4		0.0		3.4		0.0
Challenge to teacher		0.0		0.4		0.0		0.0		0.4		0.0		0.0		0.0
Substantive question		6.4		3.7		4.4		1.3		4.0		5.4		0.7		0.0
Response to Pupil		1.6		2.4		2.9		0.0		5.4		25.5		6.1		11.5
Read aloud/pupil presentation		11.3		7.3		3.6		3.9		9.8		20.1		46.2		0.0
Response to Teacher		217.9		114.6		176.6		204.9		204.9		161.0		140.5		200.9
PERCENTAGE PUPIL CONTRIBUTION (DURATION)		24%		15%		23%		44%		30%		39%		40%		32%

Table 2: Discourse moves by activity Type – Ms Leigh

	Introduce new task		Recap		Discuss Texts		Review of group work		Feedback on pupil writing		Review of pupil writing		Role Play	
DURATION WHOLE-CLASS TEACHING SAMPLED (mins)	**51**		**37**		**13**		**68**		**18**		**26**		**10**	
RATE PER HOUR														
Teacher														
Explain		62		29		0		34		20		21		38
Direct		47		24		14		58		70		58		69
Open Questions	*25%*	13	*21%*	18	*18%*	27	*11%*	11	*32%*	23	*32%*	23	*20%*	25
Closed Questions	*55%*	28	*36%*	30	*15%*	23	*27%*	25	*32%*	23	*19%*	14	*5%*	6
Probe Questions	*16%*	8	*26%*	22	*65%*	99	*49%*	47	*27%*	20	*39%*	28	*60%*	75
Uptake Questions	*2%*	1	*4%*	3	*0%*	0	*0%*	0	*0%*	0	*0%*	0	*0%*	0
Repeat question	*2%*	1	*8%*	6	*3%*	5	*6%*	6	*5%*	3	*3%*	2	*15%*	19
Repair question	*0%*	0	*6%*	5	*0%*	0	*7%*	7	*5%*	3	*6%*	5	*0%*	0
Challenge to pupil		0		0		0		0		0		0		13
Response to Pupil		33		29		36		50		2		37		38
Elaborated Feedback	*26%*	16	*53%*	29	*36%*	23	*32%*	22	*77%*	33	*77%*	23	*50%*	25
Non-elaborated Feedback	*74%*	47	*47%*	26	*64%*	41	*68%*	47	*23%*	10	*23%*	7	*50%*	25
Individual Pupil														
Call out		4		0		0		6		7		2		0
Challenge to pupil		0		0		0		1		0		0		0
Challenge to teacher		5		0		0		0		0		0		0
Substantive question		2		6		5		6		13		0		6
Procedural Question		4		3		0		8		17		9		6
Response to Pupil		6		6		9		8		57		2		13
Read aloud/pupil presentation		5		3		0		11		37		37		0
Response to Teacher		110		122		208		180		110		133		182
PERCENTAGE PUPIL CONTRIBUTION (DURATION)		15%		23%		63%		31%		49%		39%		44%

Table 3: Discourse moves by activity Type – Ms James

	Introduce new task		Introduce new topic		Recap		Discuss Texts		Review of group work		Feedback on pupil writing		Review of pupil writing	
DURATION WHOLE-CLASS TEACHING SAMPLED (mins)	**73**		**56**		**24**		**3**		**71**		**11**		**20**	
RATE PER HOUR														
Teacher														
Explain		73		62		67		58		54		28		49
Direct		33		35		12		39		34		33		31
Open Questions	*13%*	19	*15%*	35	*4%*	12	*13%*	39	*16%*	35	*33%*	84	*8%*	18
Closed Questions	*40%*	57	*33%*	76	*45%*	125	*33%*	97	*30%*	66	*20%*	50	*32%*	77
Probe Questions	*12%*	17	*16%*	37	*16%*	45	*20%*	58	*22%*	47	*17%*	45	*19%*	46
Uptake Questions	*4%*	5	*3%*	7	*7%*	20	*0%*	0	*5%*	11	*2%*	6	*3%*	6
Repeat question	*11%*	16	*16%*	36	*14%*	40	*20%*	58	*14%*	30	*15%*	39	*16%*	37
Repair question	*19%*	27	*16%*	36	*13%*	37	*13%*	39	*13%*	28	*13%*	33	*22%*	52
Challenge to pupil		0		0		0		0		3		0		0
Response to Pupil		33		81		27		78		58		22		25
Elaborated Feedback	*6%*	6	*7%*	10	*5%*	10	*0%*	0	*6%*	6	*8%*	11	*11%*	15
Non-elaborated Feedback	*94%*	88	*93%*	129	*95%*	205	*100%*	311	*94%*	96	*92%*	122	*89%*	126
Individual Pupil														
Call out		9		16		10		155		14		0		0
Challenge to pupil		0		0		0		0		0		0		0
Challenge to teacher		0		0		0		0		1		0		0
Substantive question		7		6		2		0		3		0		0
Procedural Question		2		1		0		0		2		0		9
Response to Pupil		2		1		0		0		5		0		0
Read aloud/pupil presentation		12		15		0		0		12		17		9
Response to Teacher		116		246		255		408		220		217		221
PERCENTAGE PUPIL CONTRIBUTION (DURATION)		15%		25%		18%		27%		27%		30%		24%

Discourse moves by activity Type – Mr Robbins

	Introduce new task		Introduce new topic		Recap		Discuss Texts		Review of group work		Feedback on pupil writing		Review of pupil writing		Shared Writing		Role Play	
DURATION WHOLE-CLASS TEACHING SAMPLED (mins)	**31**		**19**		**18**		**29**		**26**		**46**		**46**		**26**		**27**	
RATE PER HOUR																		
Teacher																		
Explain		56		48		50		35		18		16		38		25		11
Direct		47		10		33		49		52		9		31		28		47
Open Questions	*19%*	16	*17%*	13	*21%*	27	*7%*	10	*35%*	39	*12%*	6	*19%*	10	*18%*	25	*25%*	16
Closed Questions	*45%*	37	*58%*	45	*55%*	70	*29%*	41	*10%*	11	*40%*	22	*45%*	25	*45%*	62	*7%*	4
Probe Questions	*14%*	12	*17%*	13	*16%*	20	*36%*	51	*45%*	50	*29%*	16	*14%*	8	*15%*	21	*36%*	22
Uptake Questions	*0%*	0	*0%*	0	*3%*	3	*3%*	4	*6%*	7	*0%*	0	*0%*	0	*5%*	7	*0%*	0
Repeat question	*7%*	6	*8%*	6	*0%*	0	*7%*	10	*2%*	2	*7%*	4	*7%*	4	*8%*	12	*29%*	18
Repair question	*14%*	12	*0%*	0	*5%*	7	*17%*	24	*2%*	2	*12%*	6	*14%*	8	*8%*	12	*4%*	2
Challenge to pupil		0		0		0		0		0		0		0		2		0
Response to Pupil		17		19		33		14		11		3		12		18		31
Elaborated Feedback	*0%*	0	*6%*	6	*4%*	3	*2%*	2	*0%*	0	*4%*	1	*0%*	0	*4%*	5	*7%*	2
Non-elaborated Feedback	*100%*	78	*94%*	97	*96%*	80	*98%*	118	*100%*	109	*96%*	35	*100%*	52	*96%*	109	*93%*	29
Individual Pupil																		
Call out		10		16		7		8		9		3		6		35		16
Challenge to pupil		0		0		0		0		0		0		0		0		0
Challenge to teacher		0		0		0		0		0		0		0		0		0
Substantive question		0		2		1		0		0		0		0		0		55
Procedural Question		8		0		7		0		2		1		5		2		35
Response to Pupil		6		3		0		2		0		3		4		12		138
Read aloud/pupil presentation		0		0		10		6		5		1		0		0		0
Response to Teacher		132		133		167		193		229		62		88		201		82
PERCENTAGE PUPIL CONTRIBUTION (DURATION)		22%		22%		38%		40%		53%		37%		46 %		36 %		72%