Students' experiences of ability grouping — disaffection, polarisation and the construction of failure

Jo Boaler, Stanford University, California
Dylan Wiliam, King's College, London
Margaret Brown, King's College London

Paper presented at the British Educational Research Association Annual Conference, Queen's University of Belfast, Northern Ireland, August 27th to August 30th 1998

Address for correspondence: Dylan Wiliam, King's College London School of Education, Cornwall House, Waterloo Road, London SE1 8WA. Telephone 0171 872 3153; Fax: 0171 872 3182; Email: dylan.wiliam@kcl.ac.uk.

Introduction and background

In the UK there is a long tradition of grouping by 'ability'—a practice founded upon the idea that students have relatively fixed levels of ability and need to be taught accordingly. In the 1950s almost all the schools in the UK were 'streamed' — a process by which students are grouped by 'ability' in the same class for all subjects. A survey of junior schools in the mid-1960s (Jackson, 1964) found that 96% of teachers taught to streamed ability groups. The same study also revealed the over-representation of working-class students in low streams and the tendency of schools to allocate teachers with less experience and fewer qualifications to such groups. This report contributed towards a growing awareness of the inadequacies of streamed systems, supported by a range of other research studies which highlighted the inequitable nature of such systems. Studies by Hargreaves (1967), Lacey (1970) and then Ball (1981) all linked practices of streaming and setting (whereby students are grouped by 'ability' for individual subjects) to working-class under achievement.

The late 1970s and early 1980s witnessed a growing support for mixed-ability teaching, consistent with the more general public concern for educational equality that was pervasive at the time. But in the 1990s, concerns with educational equity have been eclipsed by discourses of 'academic success', particularly for the most 'able', which has meant that large numbers of schools have returned to the practices of ability grouping (Office For Standards in Education, OFSTED, 1993). Indeed ability-grouping is now widespread in the UK, not only in secondary schools, but also in primary schools, with children as young as 6 or 7 being taught mathematics and science (and occasionally

other subjects) in different classrooms, by different teachers, following different curricula with different schemes of work. This phenomenon may also be linked directly to a number of pressures from government. The 1988 Education Reform Act (ERA) required schools to adopt a national curriculum and national assessment which was structured, differentiated and perceived by many schools to be constraining. Research into the effects of the ERA on schools has shown that a number of teachers regard this curriculum as incompatible with mixed-ability teaching (Gewirtz, Ball, & Bowe, 1993). The creation of an educational 'marketplace' (Whitty, Power & Halpin, 1998) has also meant that schools are concerned to create images that are popular with local parents and 'setting' is known to be popular amongst parents, particularly the middle-class parents that schools want to attract (Ball, Bowe & Gewirtz, 1994). The White Paper 'Excellence in Schools' (DFEE, 1997) revealed the new Labour Government's commitment to setting:

> '... unless a school can demonstrate that it is getting better than expected results through a different approach, we do make the presumption that setting should be the norm in secondary schools.' (p.38)

In mathematics however, relatively few subject departments have needed to change *back* to ability grouping as the majority have remained faithful to practices of selection, even when they have been the only subject department in their particular school to do so. An OFSTED survey in 1996 reported that 96% of schools taught mathematics to 'setted' groups in the upper secondary years (The Guardian, 1996). This has non-trivial implications for students' learning of mathematics. Despite this, our understanding of the impact of ability grouping practices upon mathematics teachers' pedagogy and, concomitantly, students' understanding of mathematics, is limited.

Previous research in the UK has concentrated, almost exclusively, upon the inequities of the setting or streaming system for those students who are allocated to 'low' sets or streams. These are predominantly students who are also disadvantaged by the school system because of their 'race', class or gender (Abraham, 1989; Tomlinson, 1987; Ball, 1981; Lacey, 1970; Hargreaves, 1967). These research studies predominantly used qualitative, case-study accounts of the experiences of students in high and low streams to illustrate the ways in which curricular differentiation results in the polarisation of students into 'pro'- and 'anti'-school factions. Such studies, by virtue of their value-based concerns about inequality (Abraham, 1994), have paid relatively little attention to the effects of setting or streaming upon the students' development of *subject* understandings (Hallam & Toutounji, 1997). Furthermore, they have tended to concentrate on 'streaming', in which students are allocated to the same teaching group for a number of subjects—what Sorensen (1970) termed a wide *scope* system, rather than on 'setting' which is carried out on a subject by subject basis (narrow scope).

Research in the USA has provided a wealth of empirical evidence concerning the relative achievement of students in academic, general and vocational tracks. Such studies have consistently found the *net* effects of tracking on achievement to be small (Slavin 1990), with evidence that tracking gives slight benefits to students in high tracks at the expense of significant losses to students in low tracks (Hoffer, 1992; Kerchkoff, 1986). However, such studies have given little insight into the way that tracking impacts upon students' learning of mathematics, the processes by which it takes effect or the differential impact it has upon students. This is partly because quantitative methods have been used almost exclusively, with no classroom observation and no analysis of the mechanisms by which tracking influences learning. Many of the studies into tracking have also focused upon differences in group means, masking individual differences within groups (Gamoran and Berends, 1987; Oakes, 1985).

This paper will report upon interim data from a four-year longitudinal study that is monitoring the

mathematical learning of students in six UK schools. This follows on from a study of two schools that offered 'traditional' and 'progressive' approaches to the teaching of mathematics (Boaler, 1997a, b, c). Although ability grouping was not an initial focus of that study, it emerged as a significant factor for the students, one that influenced their ideas, their responses to mathematics, and their eventual achievement. One of the schools in that study taught to mixed-ability groups, the other to setted groups, and a combination of lesson observations, questionnaires, interviews and assessments revealed that students in the setted school were significantly disadvantaged by their placement in setted groups. A year group of students was monitored in each school over a three year period (n Å 300) from the beginning of year 9 until the end of year 11 (ages 13-16). The disadvantages affected students from across the spectrum of setted groups and were not restricted to students in low groups. The results of that study, that related to setting, may be summarised as follows:

• Approximately one-third of the students taught in the highest ability groups were disadvantaged by their placement in these groups because of high expectations, fast-paced lessons and pressure to succeed. This particularly affected the most able girls.

• Students from a range of groups were severely disaffected by the limits placed upon their attainment. Students reported that they gave up on mathematics when they discovered their teachers had been preparing them for examinations that gave access to only the lowest grades.

• Social class had influenced setting decisions, resulting in disproportionate numbers of working-class students being allocated to low sets (even after 'ability' was taken into account).

• significant numbers of students experienced difficulties working at the pace of the particular set in which they were placed. For some students the pace was too slow, resulting in disaffection, while for others it was too fast, resulting in anxiety. Both responses led to lower levels of achievement than would have been expected, given the students' attainment on entry to the school.

A range of evidence in that study linked setting to under-achievement, both for students in low *and high* sets, despite the widely-held public, media and government perception that setting increases achievement. Indeed the evidence was sufficiently broad ranging and pronounced to prompt further research in a wider range of schools.

Research design

In our current study we are working with six state schools that have been chosen to provide a range of learning environments and contexts. The schools are located in five different local education authorities. Some of the school populations are mainly White, others mainly Asian, while others include students from a wide range of ethnic and cultural backgrounds. The performance of the schools in the national school-leaving examination (the General Certificate of Secondary Education or GCSE) ranges from the upper quartile to the lower quartile, nationally, and the social class of the school populations range from mainly working class, through schools with nationally representative distributions of social class, to strongly middle class. One of the schools is an all-girls school and the other five are mixed.

All six schools teach mathematics to mixed-ability groups when students are in year 7 (age 11). One of the schools puts students into 'setted' ability groups for mathematics at the beginning of year 8 (age 12), three others 'set' the students at the beginning of year 9 (age 13), and the other two schools continue teaching to mixed ability groups. The students in our study have just completed the end of year 9, which has meant a change from mixed ability to setted teaching for three of the cohorts. There are approximately 1000 students in the study. Research methods have included approximately 120 hours of lesson observations, during years 8 and 9, questionnaires given to students in the six cohorts

(n=943 for year 8, n=977 for year 9, with matched questionnaires for both years from 843 students) and in-depth interviews with 72 year 9 students. This has included 4 students each from a high, middle and low set in the setted schools and students from a comparable range of attainment in the mixed ability schools. We have also collected data on attainment, social class, gender and ethnicity. This paper will draw upon questionnaire responses, lesson observations and 72, 30-minute interviews to illustrate the ways in which ability grouping practices have impacted upon students' learning of mathematics.

Research Results

When students moved from year 8 to year 9 in our study, it became clear from questionnaire, lesson observation and interview data that many students in the setted schools began to face negative repercussions as a result of the change from mixed-ability to setted teaching. Students were chosen for interview by asking teachers of high, medium and low setted groups to select a pair of girls and then a pair of boys who would be relaxed and happy to talk. Forty of the forty-eight students interviewed from setted groups wanted either to return to mixed ability teaching or change sets. The students reported that teaching practices emanating from setting arrangements had negatively affected both their learning of mathematics and their attitudes towards mathematics. Three major issues that were raised by students are discussed below:

A High Sets, high expectations, high pressure

In Boaler's previous study (Boaler, 1997b) at least one-third of the students taught in the highest set were disadvantaged by their placement in this group, because they could not cope with the fast pace of lessons and the pressure to work at a high level. The students that were most disaffected were very able girls, apparently because able girls, more than any others, wanted to understand what they were doing — in depth — but the environment of set 1 classes did not allow them to do this.

We chose to observe set 1 lessons and interview set 1 students in this follow-up study to determine whether the environment of set 1 lessons in other schools was similar and whether students were disadvantaged in similar ways. Early evidence suggests that this is the case. Every one of the 8 girls interviewed from set 1 groups in the current study wanted to move down into set 2 or lower. Six out of eight of the set 1 boys were also extremely unhappy, but they did not want to move into lower groups, presumably because they were more confident (although no more able), than the girls, and because of the status that they believed being in the top set conferred. Observations of set 1 lessons make such reactions easy to understand. In a range of top-set classes the teachers raced through examples on the board, speaking quickly, often interjecting their speech with phrases such as 'come on we haven't got much time' and 'just do this quickly'. Set 1 lessons were also more procedural than others — with teachers giving quick demonstrations of method without explanation, and without giving the students the opportunity to find out about the meaning of different methods or the situations in which they might be used. Some of the teachers also reprimanded students who said that they didn't understand, adding comments such as 'you should be able to, you're in the top set'. Before one lesson the teacher told one of us (JB) that about a third of his class were not good enough for the top set and then proceeded to identify the ones that "were not academic enough", with the students concerned watching and listening. The following are descriptions of 'top set' lessons, from students in the 4 setted schools:

School E: Mainly white, working class school with low attainment

> Lessons are difficult and if you can't answer he says, "You won't be in set 1 next year — you are the set 1 class you shouldn't be finding this difficult". (school E, boys, set 1)

> He wants to be successful, better than set 2, so he goes really fast, but it's over the top. (school E, boys, set 1)
>
> He explains work like we're maths teachers — really complex, I don't understand it. (school E, boys, set 1)
>
> I want to get a good mark, but I don't want to be put in the top set again, it's just too hard and I won't learn anything. (school E, girl, set 1)

School F: Mainly Asian, middle and working class school with average attainment

> She says, "You have to do this quickly", so you just rush and write anything. (school F, girls, set 1)
>
> Practically all the time you are rushing through and not understanding. (school F, girls, set 1)
>
> I want to go down because they do the same work but they do it at a slower pace, so you can understand it better, but we just have to get it into our head the first time and that's it. (school F, girls, set 1)

School A: Mainly white, middle and working class school with average attainment.

> It's too fast, I can't keep up. My friends are in different groups and you can't ask them for help, because you're the top set and you're supposed to know it all. (school A, girl, set 1)
>
> Most of the difference is with the teachers, the way they treat you. They expect us to be like, just doing it straight away, like we're robots. (school A, boy, set 1)

School C: Mainly White, middle class school with very high attainment:

> I preferred it in years 7 and 8, you felt more sort of comfortable, you didn't feel you were being rushed all the time (school C, girl, set 1)
>
> I used to enjoy maths, but I don't now because I don't understand it —what I'm doing. If I was put down I probably would enjoy it. I'm working at a pace that is just too fast for me. (school C, girl, set 1)

These are just a small selection of the complaints raised by students in top sets, who characterised their mathematical experiences as fast, pressured and procedural. The four schools that are represented by the comments above were not chosen because of the way that they taught mathematics and the schools are quite different in many respects. Yet the students' perceptions of set 1 lessons were similar in each of the schools. In a previous paper Boaler (1997b) argued that teachers change their normal practices when they are given top set classes to teach, appearing to believe that being a 'top set' student entails a qualitative and meaningful difference from other students, rather than simply being in the highest-attaining range of students in the school. Top-set children, it seems, do not need detailed help, time to think, or the space to make mistakes. Rather they can be taught quickly and procedurally because they are clever enough to draw their own meaning from the procedures they are given. In questionnaires students in the six schools were asked, 'do you enjoy maths lessons?' set 1 groups were the most negative in the entire sample, with 43% of set 1 students choosing 'never' or 'not very often', compared with an average of 36% of students in other sets and 32% of students in mixed ability classes. Students were also asked whether it was more important "to remember work done before or think hard" when answering mathematics questions. The set 1 groups had the highest proportion of students who thought remembering was more important than thinking. In the set 1

classes 68% of students prioritised memory over thought, compared to 56% of students in the other setted groups and 51% of students in mixed ability groups.

In the same paper, Boaler also argued that the fast, procedural and competitive nature of set 1 classes particularly disadvantages girls and that the nature of high set classes contributes to the disparity in attainment of girls and boys at the highest levels. Despite media claims that girls are now overtaking boys in all subjects (Epstein, Maw, Elwood & Hey, 1998), boys still outnumber the number of girls attaining A or A* grades in mathematics GCSE by 5 to 4. As the vast majority of able girls are taught within set 1 classes for mathematics in the UK (The Guardian, 1996) and the four schools in this study are unlikely to be particularly unusual in the way that they teach set 1 lessons, it seems likely that the under-achievement and non-representation of girls at the highest levels is linked to the environments generated within top set classrooms.

B Low sets, low expectations & limited opportunities

Students in low sets at the four schools appear to be experiencing the reverse of the students in high sets, with repercussions that are, if anything, even more severe and damaging. Indeed, the most worrying reports of the implications of the setting process for students in our sample came from students in low groups. These students reported a wide range of negative experiences, substantiated by observations of lessons. These included a frequent change of teachers (in one school the 'bottom' set had been taught by 3 different teachers in the first 9 months), the allocation of non-mathematics teachers to low sets and a continuous diet of low-level work that the students found too easy. For example:

> It's just our group who keeps changing teachers.
>
> JB: Why?
>
> 'Cause they don't think they have to bother with us. I know that sounds really mean, but they don't think they have to bother with us, 'cause we're group 5, so if they have a teacher who knows nothing about maths, they'll give them to us, say a PE teacher. They think they can send anyone down to us, they always do that, they think they can give us anybody. (school E, set 5, girls)
>
> We come in and sir tells us to be quiet and gives us some questions then he does them on the board, we want to do it ourselves but he does it.
>
> Even though we're second from bottom group, I think it would be much better if we didn't have the help with it.
>
> JB: Why does he write the answers on the board?
>
> I don't know, he thinks we're stupid.
>
> He thinks we're really low. (school A, set 6, boys)

Students were particularly concerned about the low level of their work and talked at length about teachers ignoring their pleas for more difficult work, making students who had finished the work in the first 5 minutes of the lesson sit and wait with nothing to do for the remaining 55 minutes and in some cases students being told "you can't have finished, you're set 5" (school E, set 5 girl). In some low set lessons the students were not given any mathematics questions to answer — only worked solutions to copy off the board.

> You just have to come in, sit down, there's stuff on the board and he says copy it.

> It's too easy, it's far too easy.
>
> JB: What happens if it's too easy?
>
> You just have to carry on and do it, and if you don't he gives you detention.
>
> Last year it was harder, much harder. (school E, set 5, boys)
>
> He just writes down answers from the board, we tell him that we can do it, but he just writes down answers anyway.
>
> JB: And what are you meant to do?
>
> Just write them down. That's what we say to him, 'cause people get frustrated from just copying off the board. (school A, set 6, girls)
>
> We do baby work off the board — stupid stuff that we already know, like 3 times something equals 9, it's boring and easy. (school E, set 5 girls)

In questionnaires 27% of students taught in the bottom *half* of the setted groups reported that work was too easy, compared with 7% of students in the top half of the setted groups and 14% of students in the mixed ability schools. Students in low groups were upset and annoyed about the low level of the work they were given, in addition to finding lessons boring, they knew that their opportunities for learning were being minimised:

> Sir treats us like we're babies, puts us down, makes us copy stuff off the board, puts up all the answers like we don't know anything.
>
> And we're not going to learn from that, 'cause we've got to think for ourselves.
>
> Once or twice someone has said something and he's shouted at us, he's said — well you're the bottom group, you've got to learn it, but you're not going to learn from copying off the board.' (school A, set 6, girls)

The students' reports were consistent with our observations of low-set lessons, in which students were given answers to exercises a few minutes after starting them or required to copy work off the board for the majority or all of lessons. In response to the questionnaire item 'how long would you be prepared to spend on a maths question before giving up?' 32% of students in the bottom half of the setted groups chose the lowest option — 'less than 2 minutes' compared with 7% of students in the top half of the setted groups and 22% of students in mixed ability groups. The polarisation in the students' perceptions about mathematics questions in the setted schools probably reflects the polarisation in their experiences of mathematics. We have not yet interviewed teachers to talk to them about the choices they make about the level of work but the students were convinced that teachers simply regarded students in low sets as limited:

> Sir used to say — you're the bottom group, you're not going to learn anything.
>
> JB: He says that to you?
>
> Yeah.
>
> JB: Why?
>
> I don't know, I don't think he's got faith in us, or whatever, he doesn't believe we can do it. (school A, set 6, boys)

All four schools that use ability-grouping have told us that the system is flexible and that students will change groups if they are inappropriately placed, but the students in low groups believed there to be little hope of moving to higher groups. This was partly because they did not believe that teachers were aware of the work students could do:

> I can get high if I'm pushed as hard as I can to get up there, but it's not easy when you just do the same things over and over again.
>
> JB: How can you move up?
>
> There is nothing you can do, he has no idea how we're doing, he hasn't taken our book in once. (school E, set 5 girls)

The students also believed that they were trapped within a vicious circle — to move up they needed good end of year test results, that were comparable with students in higher groups, but they could not attain good results because they were not taught the work that was assessed in the tests:

> The SATS were hard because our classwork is so easy, so we hadn't done it.
>
> I want to be brainy and go up and be good at maths, but I won't go up if the work is too easy. (school E, set 5, boys)

In the same way as the 'top set' teachers had fixed ideas about the high level and pace of work students should have been able to do, the low set teachers had fixed ideas about the low level of work appropriate for 'bottom set' students. The students reported that teachers continued with these ideas, even when students asked them for more difficult work:

> If you tell the teacher I've done this before, he'll say — well you can do it again—he doesn't set you up with any harder work, nothing like that. (school E, set 5, girls)
>
> The work is far too easy, but if we try and complain he says, "Be quiet", and then, "Detention", because we tried to explain it to him. Today he sent Mark out, 'cause he told him it was too easy, so he just sent him out. (school E, set 5, boys)

The students were clearly disadvantaged by the diet of low-level numeracy work that they were given. This problem seemed to derive partly from the teachers' perceptions about the level of work appropriate for low-set students but also from an idea that is intrinsic to setting policies and will be discussed in the final section—that students in setted groups have the same mathematical capabilities and learning styles and may be taught accordingly.

C Restricted pedagogy and pace

In mixed ability classes teachers have to cater for a range of students whose previous attainment varies considerably. Most teachers respond to this challenge by providing work that is differentiated either by providing different tasks for different students within the same class (sometimes called 'differentiation by task'), or by giving all students a task that can be attempted in a variety of ways and at a variety of different levels (sometimes called 'differentiation by outcome'). Teachers often let students work 'at their own pace' through differentiated books or worksheets. In setted classes students are brought together because they are believed to be of similar 'ability'. Yet setted lessons are often conducted as though students are not only similar, but *identical* — in terms of ability, preferred learning style and pace of working. In the setted lessons we have observed, students have been given identical work, whether or not they have found it easy or difficult and they have all been required to complete it at the same speed. This aspect of setted lessons has distinguished them from the mixed-ability lessons we have observed. The restrictions on pace and level of work that are

imposed in setted lessons have also been a considerable source of disaffection, both for students who find the pace of lessons too fast and for those who find it too slow.

In interviews students talked at length about the restrictions imposed upon their pace of working since changing to setted groups, describing the ways in which they were required to work at the same speed as each other. Students reported that if they worked slower than others they would often miss out on work as teachers moved the class on before they were finished:

> People who are slow they don't never get the chance to finish because she starts correcting them on the board already and you don't finish the module. (School A, set 4 boy)

Students also described the ways in which teachers used a small proportion of the students as reference points for the speed of the class (cf Dahllöf, 1971), and the detrimental effect this could have on their learning:

> Sometimes you can do it fast, but you don't really know it. But if she knows people have finished, she tells you have even less time to do the work, she says, "Look at these 5, they have finished, hurry up!" (school F, set 1 girl)

Students also reported that if they worked quickly they were disadvantaged as teachers made them wait for the rest of the class:

> Now in year 9, we're sort of — people can be really far behind and people can be in front. The people who work fast have to wait for people at the end to catch up. Like I finished before and I had a whole lesson to do nothing. (School A, set 4, boy)

Again the students linked these restrictions to the norms generated within setted groups:

> Last year it was OK 'cause when you finished work miss would give us harder, more to do, but this year when you finish you've just got to sit there and do nothing.
>
> It's different 'cause in sets you all have to stay at the same stage. (school F, set 3, boys)

Such problems were not caused by teachers simply imposing an inappropriate pace upon their groups — some students found lessons too fast whilst other students in the same groups found the same lessons too slow. The two boys in school F, quoted above, described the problem well — in mixed ability classes students would be given work that was chosen for them, if they finished the work teachers would give them harder work; in setted lessons "you all have to stay at the same stage". Being able to teach the whole class as a single unit is the main reason that teachers put students into 'ability' groups, and it was also one of the main sources of the students' disaffection. The students also described an interesting phenomenon — that some teachers seemed to hold ideas about the pace at which a class should work that were independent of the capabilities of the students who were in that set. For example:

> If you're slow she's a bit harsh really, I don't think she can really understand that some people aren't as fast as others. If you say — I don't understand the work, I'm slow— she'll just say you're in the middle set, you had to have got here somehow, so you've got to do middle set work. (School A, set 4 boy).

The teachers of the top sets also exemplified this phenomenon with the frequent remarks they made to students in the vein of:

> "You are the set 1 class, you shouldn't be finding this difficult" (school E, set 1 boy).

It seems that the placing of students into 'ability' groups creates a set of expectations for teachers that

over-rides their awareness of individual capabilities. This is a particularly interesting finding given that the main argument that the Prime Minister, Tony Blair, and other government ministers have given for supporting setting is that children need work that is at an appropriate pace and level for their particular 'ability'.

But the process of ability grouping did not only appear to initiate restrictions on the pace and level of work available to students, it also impacted upon the teacher's choice of pedagogy. Teachers in the four schools in our study that used ability grouping responded to the move to setted teaching by adopting a more prescriptive pedagogy and teachers who offered worksheets, investigations and practical activities to students in mixed-ability groups concentrated upon chalk-board teaching and textbook work when teaching groups with a narrower range of attainment. This is not surprising given that one of the main reasons mathematics teachers support setting is that it allows them to 'class teach' to their classes, but it has important implications for the learning of students. When students were asked in their questionnaires to *describe their maths lessons*, the forms of pedagogy favoured by teachers in the schools using ability grouping were clearly quite different from those in the schools using mixed ability teaching. Some of the students' responses to this question were given the code 'lack of involvement' because students wrote such comments as 'lessons go on and on' or 'maths lessons are all the same'. Twelve per cent of responses from students in setted groups reflected a lack of involvement, compared with 4% of responses from students in mixed-ability groups. An additional 12% of students from setted groups described their lessons as 'working through books', compared with 2% of students in mixed ability groups; whilst 8% of setted students said that the 'teacher talks at the board', compared with 1% of mixed ability students. Fifteen per cent of students in setted groups described their mathematics lessons as either "OK", "fun", "good" or "enjoyable", compared with 34% of mixed ability students.

In a separate open question students were asked how maths lessons could be improved. This also produced differences between the students, with 19% of students taught in sets saying that there should be more open work, more variety, more group work, maths games or opportunity to think, compared to 9% of mixed ability students. Eight per cent of setted students said that lessons should be slower or faster, compared to 4% of mixed ability students and 4% of setted students explicitly requested that they return to mixed ability teaching.

The influence of ability grouping upon teachers' pedagogy also emerged from the students' comments in interview. The following comments came from students across the spectrum of setted groups:

> JB: What are maths lessons like?
>
> Rubbish — we just do work out of a book.
>
> It was better in years 7 and 8. We did all fun work (school E, set 1, girls)
>
> I would like work that is more different. Also when you can work through a chapter, but more fun.
>
> Could do a chapter for 2 weeks, then something else for 2 weeks, an investigation or something —the kind of investigations we used to do. (School E, set 5, girls)
>
> Last year it was better, 'cause of the work. It was harder. In year 8 we did wall charts, bar charts etc, but we don't do anything like that. It's just from the board.
>
> I really liked it in year 7, we would work from books and end of year games — really good. This year it's just work from the board. (School E, set 5, boys)

> In year 8, Sir did a lot more investigations, now you just copy off the board so you don't have to be that clever.
>
> Before, we did investigations, like *Mystic Rose*, it was different to bookwork, 'cause books is just really short questions but those were ones Sir set for himself, or posters and that, that didn't give you the answers. (School A, set 4, boys)
>
> In year 7 maths was good, it was alright. He got us thinking for ourselves and we did much more stuff like cutting out, sticking in, worksheets. Now, everyday is copying off the board or doing the next page, then the next page and it gets really boring. (School A, set 6, girl)

The change in teaching approach that appeared to be initiated by setted teaching could simply reflect the increase in students' age and progression towards GCSE, but similar changes did not take place in the mixed ability schools. The implications of such changes for students' learning of mathematics will be discussed below.

Discussion

The students interviewed from our setted schools create an image of setted mathematics lessons, broadly substantiated by our observations of lessons and by questionnaire data, that is one of disaffection and extreme polarisation. It seems that when students were taught in mixed-ability groups, their mathematics teachers gave them work that was at an appropriate level and pace. When the students were divided into ability groups, students in high sets came to be regarded as mini-mathematicians who could work through high-level work at a sustained fast pace, whereas students in low sets came to be regarded as failures who could cope only with low-level work — or worse — copying off the board. This suggests that students are *constructed* as successes or failures by the set in which they are placed as well as the extent to which they conform to the expectations the teachers have of their set. In particular, within top sets, students are constructed as successes and failures according to the extent to which they can cope with the highly procedural approaches adopted by teachers of those sets. Other notions of success in mathematics, such as those which emphasise depth of understanding, which are arguably much closer to the concerns of professional mathematicians (Buxton, 1981, Burton, 1997) are ruled out.

The requirement to work at an inappropriate pace is a source of real anxiety for many students, particularly girls:

> I mean I get really depressed — it really depressed me, the fact that everyone in the class is like really far ahead and I just don't understand.
>
> Yeah 'cause like especially when everyone else understands it and you think 'Oh my God I'm the only one in the class that doesn't understand it'
>
> If you don't understand something, then it's just like, you know, it really depresses you. (School C, set 3, girls)

These students were not talking about minor feelings and peripheral details but issues that go directly to the heart of their experiences, and which have a profound impact both on their attitudes towards, and their achievement in, mathematics.

The major advantage that is claimed for ability-grouping practices is that they allow teachers to pitch work at a more appropriate level for their students. However, while ability-grouping practices can *reduce* the range of attainment in a class, within even the narrowest setting system, there will be

considerable variations in attainment. Some of this will be due to the inevitable unreliability of mechanisms of allocating students to particular sets, and even if the average attainment of students in a set is reasonably similar, this will mask considerable variation in different aspects of mathematics and in different topics, as the students were well aware. Indeed the students held strong beliefs that individuals have different strengths and weaknesses and that it is helpful to learn from each other and to learn to be supportive of each other:

> I prefer groups when we're all mixed up— like in form groups. 'Cause all mixed up, a variety of clever and dumb. So the dumb learn from the clever and then sometimes the clever can't do it, so they'll learn from people who aren't as good, 'cause sometimes they're good at some things but not others. (School F, set 3, boys)

> Classes should be mixed, then everyone can learn from everyone, it's not like the dumb ones don't know anything, they do know it, but the atmosphere around them in lessons means they can't work and they just think to themselves — well, what's the point? (School F, set 3, boys)

Perhaps the most surprising finding is that setting did not appear to accomplish the one thing that it was designed to do—to allow teachers to match the work set to the strengths and weaknesses of individual students. When the students were asked if work they were given was at "the right sort of level", the proportion of those taught in mixed-ability groups who said that the work set was 'usually about right' for them was actually higher (81%) than that for those taught in ability-groups (77%).

Another consequence of setting that emerged in Boaler's previous study, and which is beginning to emerge in the current study, is the consequence of set allocation for students' entry to the GCSE. The report of the Committee of Inquiry into the Teaching of Mathematics in Schools (1982), generally known as the 'Cockcroft report', argued that it was unacceptable that the majority of students entered for the school leaving examination would gain less than 40% of the available marks. The report recommended that school-leaving examinations in mathematics should be differentiated, so that students would take only those papers appropriate for their attainment. For the mathematics GCSE, there are currently three 'tiers' of entry, with different syllabuses. Because schools find it difficult to operate with students in the same class following different syllabuses, most schools in the country (and all the four schools using ability-grouping in our study) enter all the students in a particular class for the same tier of the examination. The effect of this is that students in the lower sets will be entered for an examination in which the highest grade they can achieve is a grade 'E', whereas the only grade that is ever specified for recruitment or for further study is a grade 'C'.

In Boaler's previous study, the students did not become aware of this restriction until their final year of schooling, year 11, and this discovery caused considerable resentment and disaffection. In the current study, only a few students (exclusively in the top sets) are aware of the effects of tiering, but it is already a significant issue for those beginning to understand the implications of the tiering system:

> I was reading from the maths literature that if you get put in the middle group for maths, that means they are aiming for a B for GCSE. But I don't think that is fair, it's like saying you can't go higher than a B sort of thing. I think they should give you the work and what you get is what you get. They shouldn't try and aim you for something, because you never know, you could get an A. They put you in separate groups next year and you stay there for 2 years and set you work for a B and I don't think that's fair. (School C, set 1, girl)

There were, of course, some students in our sample (one-sixth of those students we interviewed) who were comfortable with being taught in sets. The majority of these were those taught in intermediate

groups, who did not want to move up (interestingly) or down and worked at a pace and level that was appropriate for them. Another benefit of setting for these students was the opportunity setting provided for bringing together a large group of students working on the same areas of mathematics. However, none of these students knew about the restriction of grades in the GCSE, and it is doubtful whether they would continue to be happy to remain in an intermediate set if they discovered that the school had decided that they would be entered for a tier of the GCSE for which the maximum grade they could achieve would be an 'E'.

As we have noted above, many of the disadvantages of setting that we have described are contingent rather than necessary features of ability-grouping, but we believe that they are widespread, pervasive, and difficult to avoid. The adoption of ability-grouping appears to signal to teachers that it is appropriate to use different pedagogical strategies from those that they use with mixed-ability classes. The best teachers are allocated to the ablest students, despite the evidence that high-quality teaching is more beneficial for lower-attaining students (Black & Wiliam, 1998, p42). Curriculum differentiation is polarised, with the top-sets being ascribed qualities as mathematicians, not as a result of their individual qualities, but simply by virtue of their location in a top set. In order to ensure that the entire curriculum is covered, presumably to suit the needs of the highest-attaining students within the top set, the pace of coverage is both increased and applied to the whole class as a unit, and teachers seem to make increased use of 'transmission' pedagogies. For some students, who are able to conceptualise the new material as it is covered, the experience may be satisfactory, but for the remainder, the effect is to proceduralise the curriculum until it becomes a huge task of memorisation. The curriculum polarisation results in a situation in which upward movement between sets is technically possible, but is unlikely to be successful, because a student moving up will not have covered the same material as the class she is joining. Finally, because of the perversities of the examination arrangements for mathematics GCSE, the set in which a student is taught determines the tier for which a student is entered, and thereby, the maximum grade the student can achieve, and, for most students, this decision will have been made three years before the examination is taken.

Of course, we are not advocating that schools should dispense with ability-grouping immediately—that would clearly be disastrous—but we do believe that the features of the practices adopted by the schools who have maintained mixed-ability teaching with older students provide important suggestions as to how schools can reduce their dependence on between-class ability grouping as the primary strategy for dealing with the diversity of attitudes, capabilities and attainments of students in mathematics. We would also suggest that government ministers should be promoting research and inquiry into mixed ability teaching, and supporting those schools that use such forms of grouping successfully, rather than discriminating against these schools and exerting pressure upon them to change (Boaler, 1997c).

Because all of the schools in our study make some use of mixed-ability grouping in the earlier years, all the teachers in our sample have some experience of teaching mixed-ability classes, for which a variety of strategies are used. Some make substantial use of independent learning schemes which allow a teacher to give each student an individual programme of work. They also use within-class grouping, with students on different tables working on different materials and at different speeds. Most of the teachers in the sample also made some use of more open tasks, which can be tackled at a variety of levels. Although these more open tasks were used infrequently with setted classes, it was surprising how favourably these were regarded by the students. When the students who were taught in sets were asked for the best lesson they remembered that year, almost every student described a lesson where the whole class had worked on an investigation or a problem that could be tackled in different ways

Within-class grouping, a system which is used by some of the teachers in one of our 'mixed ability' schools, is much more flexible. It allows opportunities for whole classes to do the same work and allows students that are regarded as weaker on some areas to shine. One student, regarded by her teacher as the 'weakest' in her mixed ability mathematics class, described her best lesson thus:

> It was last week, we were doing bar charts and pie charts and all that and I think I was the 3rd person in the class who got it properly — we had to make it into a graph, it was good. (School B, mixed-ability, girl)

Some degree of within-class grouping also allows teachers to ensure that students are given appropriate work, and, importantly, that the level of assigned work is altered if and when this becomes appropriate:

> We have different books — high books, medium books, low books, so everyone has the right amount of work — no-one's doing nothing too hard or too easy. If you think that it's too hard or too easy you just tell miss and she gives you the right level. (School B, mixed-ability, girl)

Of course, within-class grouping does often result in a situation in which the teacher ends up explaining the same idea to different groups at different times, but this seems a small price to pay compared to the alternative. As one boy remarked:

> In my primary school we weren't in groups for how good we were in subjects we were just in one massive group and we did everything together. You got some smart people and some people in our class, so well, we all sort of blend in, so you don't *have* to be that good and you don't *have* to be that bad. (School A, set 4, boy, original emphasis)

Indeed, this student captures eloquently what we found to be the most important, and previously unreported feature of ability grouping — it *creates* (McDermott, 1993) academic success and failure through a system whereby students "*have* to be that good" or they "*have* to be that bad".

Conclusion

We are aware that this may seem like a one-sided report, but we are confident that our findings fairly represent the data that we have collected, and that our data collection methods, while not unproblematic, have captured a reasonably faithful picture of the day-to-day realities of the classrooms we are studying. We are also confident that the schools in our sample are not untypical of the generality of schools in Britain.

Although there are substantial problems in interpreting the results of international comparisons (Brown, 1998, Wiliam, 1998), there is little doubt that, in a variety of respects, the performance of primary and secondary school students in the United Kingdom is modest by international standards (Beaton, Mullis, Martin, Gonzalez, Kelly & Smith, 1996; Mullis, Martin, Beaton, Gonzalez, Kelly & Smith, 1996). Kifer & Bursten's (1992). Analysis of data from the Second International Mathematics Study (SIMS) suggests that the two factors that are most strongly associated with growth in student achievement in mathematics (indeed the only two factors that are consistently associated with successful national education systems) are *opportunity to learn* (ie the proportion of students who had been taught the material contained in the tests) and the degree of *curricular homogeneity* (ie the extent to which students are taught in mixed-ability, rather than setted, groups).

While Bennett, Desforges, Cockburn and Wilkinson (1984) found that teachers using within-class ability grouping tend to *over-estimate* the capabilities of weaker students, and set insufficiently challenging work to the most able, the evidence that we have found in the current study suggests very strongly that between-class ability grouping produces the opposite effect. Indeed, the strength of the

curriculum polarisation, and the diminution of the opportunity to learn that we have found in the current study, if replicated across the country, could be the single most important cause of the unacceptably low levels of achievement in mathematics in Great Britain. The traditional British concern with ensuring that *some* of the ablest students reach the highest possible standards appears to have resulted in a situation in which the vast majority of students achieve well below their potential. As one student poignantly remarked:

> Obviously we're not the cleverest, we're group 5, but still— it's still maths, we're still in year 9, we've still got to learn. (school E, set 5, girl)

References

Abraham, J. (1989) Testing Hargreaves' and Lacey's differentiation-polarisation theory in a setted comprehensive. *British Journal of Educational Sociology,* **40**, 46-81.

Abraham, J. (1994) Positivism, Structurationism and the Differentiation-Polarisation Theory: a reconsideration of Shilling's novelty and primacy thesis. *Br. J. of Sociology of Education,* **15**(2), 231-241.

Ball, S. J. (1981). *Beachside comprehensive*. Cambridge: Cambridge University Press.

Ball, S. J.; Bowe, R.; Gewirtz, S. (1994) Competitive Schooling: Values, Ethics and Cultural Engineering *Journal of Curriculum and Supervision,* **9** (4), 350-367.

Beaton, A. E.; Mullis, I. V. S.; Martin, M. O.; Gonzalez, E. J.; Kelly, D. L. & Smith, T. A. (1996). *Mathematics achievement in the middle school years: IEA's third international mathematics and science study*. Chestnut Hill, MA: Boston College.

Bennett, N.; Desforges, C.; Cockburn, A. & Wilkinson, B. (1984). *The quality of pupil learning experiences*. London: Lawrence Erlbaum Associates.

Black, P. J. & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles Policy and Practice*, **5**(1), 7-73.

Boaler, J. (1997a). Setting, social class and survival of the quickest. *British Educational Research Journal,* **23**(5), 575-595.

Boaler, J. (1997b). When even the winners are losers: evaluating the experiences of 'top set' students. *Journal of Curriculum Studies,* **29**(2), 165-182.

Boaler, J. (1997c). *Experiencing school mathematics: teaching styles, sex and setting*. Buckingham: Open University Press.

Brown, M. L. (1998). The tyranny of the international horse race. In R. Slee, G. Weiner, & S. Tomlinson (Eds.), *School effectiveness for whom?* London: Falmer.

Burton, L. (1997, 11 December) *Mathematics—communities of practice?* Paper presented at Meeting of the Research into Social Perspectives on Mathematics Education Group held at University of London Institute of Education. Birmingham: University of Birmingham School of Education.

Buxton, L. (1981). *Do you panic about maths? Coping with maths anxiety*. London: Heinemann Educational Books.

Committee of Inquiry into the Teaching of Mathematics in Schools (1982). *Report: mathematics counts*. London: Her Majesty's Stationery Office.

Dahllöf, U. (1971). *Ability grouping, content validity and curriculum process analysis*. New York, NY: Teachers College Press.

Department for Education and Employment (1997). *Excellence in schools*. London: The Stationery Office.

Epstein, D.; Maw, J.; Elwood, J. & Hey, V. (1998). Guest editorial. *Journal of Inclusive Education*, **2**(2), 91-94.

Gamoran, A. & Berends, M. (1987). The effects of stratification in secondary schools: synthesis of survey and ethnographic research. *Review of Educational Research*, **57**(4), 415-435.

Gewirtz, S.; Ball, S. J. & Bowe, R. (1993). Values and Ethics in the Education Market Place: the case of Northwark Park. *International Studies in Sociology of Education*, **3**(2), 233-254.

Hallam, S. & Toutounji, I. (1996). *What do we know about the grouping of pupils by ability? A research review*. London: University of London Institute of Education.

Hargreaves, D. (1967). *Social Relations in a Secondary School*. London: Routledge & Kegan Paul.

Jackson, B. (1964). *Streaming: an education system in miniature*. London: Routledge and Kegan Paul.

Kerchkoff, A. C. (1986) Effects of ability grouping in British secondary schools. *American Sociological Review* **51** (6) 842-858.

Kifer, E. & Bursten, L. (1992). Concluding thoughts: what we know, what it means. In L. Bursten (Ed.) *The IEA study of mathematics III: student growth and classroom processes* (pp. 329-341). Oxford: Pergamon.

Lacey, C. (1970). *Hightown Grammar : the school as a social system*. Manchester: Manchester University Press.

McDermott, R. P. (1993). The acquisition of a child by a learning disability. In S. Chaiklin & J. Lave (Eds.), *Understanding practice: perspectives on activity and context* (pp. 269-305). Cambridge: Cambridge University Press.

Mullis, I. V. S.; Martin, M. O.; Beaton, A. E.; Gonzalez, E. J.; Kelly, D. L. & Smith, T. A. (1996). *Mathematics achievement in the primary school years: IEA's third international mathematics and science study*. Chestnut Hill, MA: Boston College.

Oakes, J. (1985). *Keeping track: how schools structure inequality*. New Haven, CT: Yale University Press.

Office for Standards in Education (1993). *Mathematics key stages 1, 2, 3 and 4, fourth year 1992-93: a report from the office of Her Majesty's Chief Inspector of Schools*. London: Her Majesty's Stationery Office.

Slavin, R. E. (1990). Achievement effects of ability grouping in secondary schools: a best evidence synthesis. *Review of Educational Research*, **60**(3), 471-499.

Sorensen, Å. B. (1970). Organisational differentiation of students and their educational opportunity. *Sociology of Education*, **43**, 355-376.

The Guardian. (1996, 8 June). Blair rejects mixed ability teaching. *The Guardian.* p. 7.

Tomlinson, S. (1987). Curriculum option choices in multi-ethnic schools. In B. Troyna (Ed.) *Racial Inequality in Education* London: Tavistock.

Whitty, G; Power, S & Halpin, D. (1998) *Devolution and Choice in Education*. Buckingham: Open University Press.

Wiliam, D. (1998). Making international comparisons: the Third International Mathematics and Science Study. *British Journal of Curriculum and Assessment*, **8**(3), 37-42.

This document was added to the Education-line database 17 September 1998

Education-line

Start a new search

Full Reference

Author(s): Boaler, Jo; Wiliam, Dylan; Brown, Margaret

Title: Students' experiences of ability grouping — disaffection, polarisation and the construction of failure

Pages: 14 pages

Note: Paper presented at the British Educational Research Association Annual Conference, Queen's University of Belfast, Northern Ireland, August 27th to August 30th 1998 Address for correspondence: Dylan Wiliam, King's College London School of Education, Cornwall House, Waterloo Road, London SE1 8WA. Telephone 0171 872 3153; Fax: 0171 872 3182; Email: dylan.wiliam@kcl.ac.uk.

Abstract:

Level: Secondary Education

Document type: Conference Papers

Treatment: Longitudinal Studies

Subjects: **Mathematics Achievement;** Mixed Ability; Pupil Attitudes; Secondary School Pupils; Streaming

---

Hypertext references:

You can choose to see

The document in HTML form

The document in Microsoft Word for Windows form

You can submit a comment about this document for inclusion in the database

---
