

MATHEMATICAL MARGINALISATION AND MERITOCRACY: INEQUITY IN AN ENGLISH CLASSROOM

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Abstract

In this paper I explore the structuring of English children into learning and life trajectories and the part that mathematics has in this process. Using case reports of two ten-year olds in their final year of primary school education, I examine how broader family social milieu impact upon mathematics learning trajectories. Stacey and Edward live not far from one another in a city in the midlands of England and have been in the same class from age 5 to 11 yet their social distance is considerable. Through the mobilisation of various classed and classifying responses to school mathematics they have developed two very different perspectives on the value of mathematical study. This examination of mathematical marginalisation and misrecognised meritocracy raises questions about the extent to which teachers can disrupt such processes.

INTRODUCTION

Children from marginalised groups in our society are learning mathematics in most English comprehensive schools. However, in spite of our apparently inclusive school system – currently under threat by the neo-liberal shift to establishing school markets – classifying work happens in school on a daily basis. England has a strong class history and although the traditional distinctions of the ‘working’ and ‘middle’ classes are clumsy and outdated social hierarchies continue to impact upon learners of mathematics in schools. Bourdieu (1998, 86), writing from a French perspective, argued that social classes do not objectively exist but that the process of classification is ongoing, “something to be done”, and it is aspects of these processes that I want to explore here. I am particularly interested in the ways in which school mathematics contributes to this social stratification. We know that mathematics tends to act as a social filter (Howson and Wilson 1986; Davis 1993), particularly through the examinations that ascribe *final judgements* in learners:

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Often with a psychological brutality that nothing can attenuate, the school institution lays down its final judgements and its verdicts, from which there is no appeal, ranking all students in a unique hierarchy of all forms of excellence, nowadays dominated by a single discipline, mathematics. (Bourdieu 1998, 28)

However, the arrival at this point is the culmination of many years of gradual distinction; of subtle effects on the learning trajectories of learners which culminate in significant difference, much of which is related to social background and the economic, cultural and social resources of children and their families. Much of this is as a result of structural limitations in the English education system. For instance, we have had for many years under recruitment of mathematics teachers and these have then been dispersed unevenly between types of schools (Noyes 2006). The impact that this has is cumulative upon schools in more challenging circumstances as they cannot recruit enough teachers whilst those in more affluent suburbs can pick the best of the new recruits. Moreover, the National Curriculum, designed to achieve the goals of the 'old humanists' and 'industrial trainers' (Ernest 1992) has done little for those groups less likely to achieve the magical grade C at the end of their compulsory mathematics education.

Heymann, writing of the German mathematics education could equally well be describing the UK when he says that "almost everything that goes beyond the standard subject matter of the first seven years of schooling can be forgotten without the persons involved suffering from any noticeable disadvantages" (Heymann 2003, 86). Whilst this may be true in one sense - regarding curriculum content - it is certainly not the case that lack of success in secondary mathematics does not lead to disadvantage. Mathematics has formatting power (Skovsmose 1998), not only through its application in science, business and more generally in society but through the way it is used to organise people. This organisation might be the explicit filtering work of school mathematics (e.g. through access to further educational and work opportunities) or hidden in the daily mathematics practices of life (e.g. through understanding of finance and credit arrangements and the implications that such things have upon economic well-being).

My interest in this paper is not about different schools with supposed homogenous groups of advantaged or disadvantaged students because my concern is with how mixed groups of learners get sifted through their mathematics education. It is clear that differences between schools in quite different social milieus might have an effect upon mathematics learning. However, what happens in a particular school for children with quite different social, economic and cultural resources? How does mathematics education function for them? In secondary schools (and increasingly now at the primary level) one way in which this happens is through the setting of children into ability groups from aged 11. In the UK this is predicated upon performance in National Tests and we know from the work of Cooper and Dunne (Cooper 1998; Cooper and Dunne 2000) that this will tend to disadvantage those with lower levels of cultural and linguistic capital (Zevenbergen 2001). One local teacher recently noted in her Masters research report that all of her bottom set were on the Free School Meals (FSM) register (taken as the default measure of socio-economic status) whereas there were very small numbers in the top sets in similar circumstances. If setting by FSM would yield similar group composition to setting by 'ability' we must reconsider the social construction of ability (Gillborn and Youdell 2001) and the potential inequity of ability grouping (Boaler, William et al. 1998; Zevenbergen 2005). This debate continues in the UK with both the main political parties using setting as part of the 'standards' agenda rhetoric and a potential vote-winner for 'middle England'. There is also evidence to suggest that the different supply of teacher quality across the education system is also replicated within schools: Nardi and Steward's (2003) study of T.I.R.E.D. mathematics highlighted the perception amongst some learners that better groups (i.e. those with fewer FSM pupils?) were given teachers who were perceived to be better. There is a type of fractal similarity

of these processes between schools, between groups and then within groups themselves, with some children benefiting more from the teachers instruction than others.

It is this lower level of analysis, the classroom, that I want to consider here by looking into a primary school classroom in which children are not grouped for mathematics. At the time this data was collected many schools were imitating the secondary school penchant for ability grouping but this school was retaining an apparently all-ability approach with children working in mixed groups. These two children had worked together in the same class for 6 years; they have had the same teachers, the same peers and so on. They both live in single parent families but that is where the similarity ends for the capital resources (economic, cultural and social) were quite different and here again Bourdieu helpfully explains how, in the light of this difference, an apparently fair, all-ability teaching approach might not be so equitable:

...to penalize the underprivileged and favour the most privileged, the school has only to neglect, in its teaching methods and techniques and its criteria when making academic judgements, to take into account the cultural inequalities between the different social classes. In other words, by treating all pupils, however unequal they may be in reality, as equal in rights and duties, the educational system is led to give its *de facto* sanction to initial cultural inequalities. The formal equality which governs pedagogical practice is in fact a cloak for a justification of indifference to the real inequalities with regard to the body of knowledge taught or rather demanded. (Bourdieu 1974, 37)

This is a really important idea that has considerable implications for mathematics educators; assuming equality is to reinforce inequality when teaching. I will return to this in the closing discussion.

The data reported here aim to ground this idea in the mathematical work of two children: Edward and Stacey. It comes from longitudinal case studies that included school participant-observation, interviews with teachers, children and their parents and video diaries (Noyes 2004) compiled by the children during their final year in primary school. Although they are simply two case studies they are part of a larger group for whom similar processes were at work and using the fractal similarity metaphor I would contend that such case do in fact tell us a lot about the 'big picture'. What is interesting for these two children is the role of the parental aspirations and how their investment of inherited cultural and social resources in the schooling process accrue different gains for Edward and Stacey. To make sense of these two learners' mathematical trajectories it is insufficient to look only at their classroom behaviours so the data reported here are as much about their family context as they are about mathematics.

Stacey

Stacey's mathematics attainment was amongst the lowest in the group. Despite her academic record she proved to be very capable of reflecting upon her personal and social circumstances, being able to articulate her thoughts and feelings clearly, although sometimes with muddled speech. Her 'style of speech and accent', being unsophisticated in comparison to the other children, and regularly containing spoken errors, suggested that she came from a lower income family (Bourdieu 1974, 39). Her relatively low level of linguistic capital put her at a disadvantage in the schooling field because although schools require linguistic 'ability', which is not really ability but the result of family socialisation, they do not give it (Bourdieu 1973, 80). So only those children who come already endowed with

such capital are in a position to make the most of the opportunities schools purport to 'offer' equitably to all children (Bourdieu 1974).

Stacey lived at home with her mum and older sister, not far from the school in a small semi-detached property. She often spoke of her relationship to her older sister, usually in negative terms, describing what Laura had said or done to her. The impact on her mathematical development and developing attitudes to school and learning can be seen in a number of places. In her first video diary entry Stacey made it clear what she thought about, or what she wanted me to think she thought about, mathematics:

Stacey's diary: Maths...I hate it! I hate it! I hate it! Three things about maths...boring, boring, boring!

[Follow-up interview]

Andy Would you like to explain a bit about that?

Stacey I don't like maths cause it's hard

Andy Could you be more specific?

Stacey Well I can't really time [multiply] that well...my sister calls me a dumb-ass, excuse me.

Andy Is your sister good at maths?

Stacey I don't know, she doesn't go to school ever.

Andy How old is she?

Stacey Sixteen

Andy What year is she in?

Stacey Er...year 10 or 11

Andy So she just doesn't go to school?

Stacey Well she does sometimes...it depends whether my mum makes her.

Andy What does she do when she doesn't go to school?

Stacey She hangs around with her friends.

Andy Who are they?

Stacey Tammy Watson, but they ran away twice so they are not allowed to make contact with each other so Laura's getting mardy and she pretends to be ill.

The move to talking about her sister effectively shifted my attention away from mathematics through her admission that her sister calls her a "dumb-ass". Unlike Edward, Stacey was not comfortable talking about her mathematics learning, partly due to what mathematics made her feel like. Here again the influence of the older sister is apparent:

Diary entry: The thing that makes maths hard for me is that I don't think I'm really good at it...erm...I have to say this prufully, I mean trufully...erm...I know what everyone's thinking, that...I'm the dumbest kid in the class...and...me and Sonya really need desperate help. I'm not saying that she's bad or anything but me and Sonya need really desperate help.

[Follow-up interview]

- Andy Do you really think that everybody thinks you're the dumbest kid in the class? [Stacey nods] How do you know that?
- Stacey Because every time I put my hand up I normally like, roughly get it wrong.
- Andy But you do get some things right don't you? Do you still think that Mrs Clarkson doesn't like you?
- Stacey She didn't like my sister as well. She kept on shouting at my sister and everything.
- Andy She doesn't shout at you though does she?
- Stacey Well not roughly. She kind of like shouts a bit then after I've done my spelling test she goes [teacher voice] "I just want the best for you".
- Andy Do you think that she does want the best for you?
- Stacey No.
- Andy What do you think that she does want then?
- Stacey Erm to be like Matt cause everyone thinks that like Matt's the teachers pet...my sister says that I might have to go to a school that helps people that like need help...but I'm scared of that...don't know why I'm telling you that.
- Andy I would think that you are scared of that. Did she say where you would go?
- Stacey No she said like this school where all the dumb kids have to go and you never see your mum or dad again.

Stacey did often "roughly, get it wrong" in lessons that I observed, and although she didn't appear to mind much in the classroom, it was a cause of anxiety, confirming her self-designation as "the dumbest kid in the class". Here Stacey is subject to her own and others' classifying work and there is a certain amount of emotional violence to this process. She evidently felt that she would not be able to please the teacher if she could not become like Matt, and her mocking use of the teacher's voice adds further weight to her feeling that her best was not good enough. Stacey's simple understanding of how teacher rhetoric can disguise subtle forms of favouritism reveals her sense of how the school system is unjust. She knows that the school field values highly successes like Matt and she also knows that despite her best efforts she cannot be like him. Carr and Kurtz-Costes (1994, 264) point out that "teachers' subtle messages to children about their abilities influence not only their view of themselves, but also their classmates' expectations for their academic performance". Even in the normal interactions of the year six classroom such 'subtle messages' give children a clear idea of their relative position in the group. So Stacey reveals how the teacher uses language to strengthen the children's intellectual, and therefore cultural and social positions, within the group.

Stacey also articulated how the two sisters have to compete for their mum's time. This was due in part to the long shifts that mum worked in her job, sometimes not getting home until eight in the evening. The kinds of work that Stacey's mum could get with her educational

qualifications were limited, highlighting another process whereby Stacey's social context structured her life. Stacey would often speak of the cool response that she got from her exhausted mum and these economic conditions resulting from low educational achievement now lead to reduced support for Stacey's schooling. Stacey's mum, by her own account, "did crap at school":

- Stacey's mum: My school? I went to quite a few schools 'cause my parents separated. I went to primary school...I went to two, one was a church school and one wasn't...failed my 11+... I've been to a fair few schools and...I never went to school at all in my last year.
- Andy Really, and did you get away with that?
- Mum Yeah, cause I moved up from Cornwall in year 4 and then year 5 went to...was it Mundella... to go and see if they had the options and they didn't have the options and the school turned round to me and said you either come to the school now and do whatever, wherever we've got places for or you go back to Cornwall and finish off your education...and that was it. I never went to school again. So I never had a leaving certificate, never took an exam.

Despite having dropped out of school she had managed to get work and bring up her children in a relatively stable environment. This historical account was one of rejection by the system, of not fitting in and of the messiness of moving between schools. She proceeded to describe how she "bludgeons" her way through the mathematical components of her job, and how she has recently had further opportunities to study again but did not complete the course because of family illness. Her family situation meant that there was not enough support available to enable her to fulfil her role as carer as well as completing these courses.

Even though Stacey's mum recognised the negative impact of instability on her own learning, addressing this issue in isolation has evidently not had a transformative effect on her children's success in school. As I described above there are the contributory factors of language and style, as well as the amount and kinds of support that she gives to her children. Another aspect of reproduction indicated by this excerpt is mum's acknowledgement that "I have so many problems". The negative undertones of an invisible oppression seen here are reproduced in Stacey's dispositions as we have seen, but also more precisely. Stacey explained that "my friends at school...I do have problems making them" and in reflecting on how she understood the video camera she described it as "my mum that was zipped up and couldn't speak, so she knew my problems". Talk of having problems is a family trait, and more generally a trait originating in the family's social background. What is also interesting here is the sense of isolation and helpless inevitability about such problems. In addition Stacey reminds us of the fact that she feels that mum doesn't listen, or show concern for the things that worry her.

Understanding this family context is necessary to be able to make sense of Stacey's classroom dispositions and mathematical learning. She was one of a small group of children who had been identified as needing extra support in her mathematics in the run up to the KS2 national tests. The teacher explained that "there's no way that they [a small group of children including Stacey] are going to get level four". Consequently they were in effect denied access to aspects of the class work. However, Stacey was in the classroom for much of the maths lessons that I observed each week. Her lack of confidence was clear in the

early part of the lesson when the teacher often used interactive whole-class methods including number cards or white boards. Stacey would often watch other children intently as they scribbled their answers to questions and would then surreptitiously copy them. On other occasions she moved number cards around as they were held up making it difficult to see the numbers. She appeared to use a range of strategies for avoiding the embarrassment of being found to have the wrong solution to a problem. This mathematical anxiety was understood to be a familial condition:

- Andy So Laura's good at art but you don't know what else she's good at. Is there anything that she doesn't like doing?
- Stacey Maths (giggles), it runs in the family!
- Andy It runs in the family, why, who else doesn't like maths?
- Stacey Mum. Dad's okay. Well I don't live with my dad but I see him sometimes.
- Andy So how do you know that your mum doesn't like maths?
- Stacey I asked her to help with my maths. I did some maths and I got all of them wrong and I told her
- Andy And what did she say?
- Stacey It's your work, you should do 'em.
- Andy Do you think that she couldn't do them either?
- Stacey I think she couldn't

Whether or not Stacey's conclusion regarding her mum's mathematical ability was accurate, the effect was the same, Stacey lacked confidence and since she clearly thought (along with her peers) that the teacher's favourite subject was mathematics, she had a problem. On some occasions she was given alternative work to do because she had not understood the previous lesson. So rather than being kept together with the rest of the all-ability class she got left largely to her own devices.

Her mum's response to Stacey's request for help could have been to do with her mathematical ability, as was Stacey's interpretation here, but the impact of this response is also to leave her unaware of what Stacey is doing and whether or not she can complete it successfully. Maybe she expects Stacey to take a lot of responsibility with her schoolwork, unlike Edward's mum who is much more hands-on in supporting Edward with his homework. The effect for Stacey is to allow her to drift towards the disaffected position of her older sister. Lord, Eccles, *et al.* report US studies of the transfer to junior high that indicate that "the most salient predictors of self-esteem change are the adolescents' math ability, physical attractiveness, and peer social skill self-concepts" (Lord, Eccles et al. 1994, 189). Admittedly the context is different but Stacey does not score too highly on any of these areas and so by their reckoning should be expected to struggle. What that research does not explain is the way in which these three important 'predictors' are themselves socially constructed.

Edward

The contrast between Edward and Stacey is stark. He is a confident, extrovert child whose parents – now separated- profited from a successful family business. His mum works in a

local library as this allows her to organise her time more effectively to look after her children.

Edward's mum: I got this job...it's a job that really fits in with Edward and his life. It's very convenient for me. I don't work in the afternoons I only work mornings, because the main thing I've had in my life ever since I had Edward was that he wasn't going to be a latch-key-kid, and it was really important to me that when I got back from school my Mum was there and I feel that is really important for children so...

This different parenting role is made possible by the economic position of Edward's parents. This not only effects his relationships with his parents and the support that they give him but the cumulative effect upon his development as a learner of mathematics is also clear. When I began working with Edward and his peers they had some idea of what I was researching and were asked to bring something of interest to talk about to our first interview. Edward's choice was his coin collection; gathered from family members' world travels. He attempted to generate some mathematical view of his collection and this willingness to see mathematics in the world around him was a common feature of his interactions with me. I have no evidence to suggest that he was particularly interested in mathematics per se (although he does claim to be) but rather he had a liberal sense of how mathematics was embedded in culture. He seemed very aware of the research game and was quick to elucidate this mathematical view of the world. As well as mathematizing his coin collection he described the school trip to the astronomy research centre Jodrell Bank; of the ratios of planetary sizes and distances; names of shapes; he enjoyed work with coordinates because it was like playing battleships.

He had a masculine view of mathematics and mathematical activity and his mum's beliefs must have influenced this:

Edward's mum: I think he's going to be more of a creative writing kind of person and an artistic person...He used to do some incredible drawings but he doesn't seem to be doing that any more and he just seems to be going more towards the maths and science, which I think's good. I think it's good for a boy. I wouldn't want him really to be the arty-farty type; I think to get a good career you have to be that way inclined

This perspective on mathematics is also seen in Edward's description of classroom learning. He, like Stacey, is acutely aware of class ranking (although he is not altogether accurate) and speed and competition are closely linked to mathematical success:

Edward's diary: I didn't do too well in the test about maths last time I only got 35 out of 45 and I was quite disappointed about that...I think it was the nerves cause I couldn't really remember doing a proper test before.

[Follow-up interview]

Andy: so were you disappointed because you got 35 out of 45 or because other people got more than you?

Edward: both

Andy: If you had got the top mark with 35 out of 45 would that have been good?

Edward: Mmm, I would have felt better

Andy: so it's not only about how much you got but who you did better than?

Edward: yeah I suppose

Andy: who do you want to be as good as?

Edward: I want to be as good as Matt cause today we finished maths more or less exactly the same time so were always you know...top

So, like Stacey, Edward has a strong sense of position in the group but his position is near the top and something that he is striving to improve, unlike Stacey who somehow feels powerless to do anything about being 'the dumbest kid in the class'.

Andy: talking about maths...how would you rate yourself in terms of the whole class, what position.

Edward: [quickly] third

Andy: after whom?

Edward: Matt, er, well second possibly. I think Francesca would beat me as well. It depends really as I have never really sat anywhere near Francesca so I don't know how far she gets. Me and Tim were the first ones to do the entire thing today cause everyone else didn't do all of what we did

This idea that speed is related to ability is common amongst these learners (Nicholls 1978; Nicholls 1984) and this view is reinforced by the dominant pedagogic style of the teacher. Mathematics lessons are structured around text-book exercises with rewards and praise usually given for quick and successful completion of work.

Edward apparently studies maths a lot at home, not for the love of the subject but as part of a strategic plan for his future. His Dad gets him to do extra maths work when he is with him on a Thursday as his parents want him to go to city's prestigious fee-paying school for boys. This association is striking as there is recognition in this family of the gate keeping role of mathematics:

Andy: so why do you think that you got into the boys high school?

Edward: I was very polite and I had a very long conversation with the headmaster and, erm, apparently the maths teacher could tell that I could see things quite easily without having to work them out. So, I think it was based on maths really

Andy: so what do you think are the kinds of people that they are looking for, to go to the high school?

Edward: well they're definitely looking for sporty people. They want the majority of sporty people and they were quite impressed with my sport 'cause I do loads and they're looking for music, you know, people that play things like the cello or something. You have got to get over a grade four I think...and then they look at academics as well so it's just...if you get a music scholarship for instance that has got nothing to do with the academics really so I think they just apply for the music scholarship without taking the 11+

The self-perception of being an academic (rather than a musician) is interesting, as is Edward's view that maths played a key role in his securing a place. Also interesting is the role of 'manners', those dispositions of the habitus that demonstrate his suitability to be included amongst those with similar privileged backgrounds. Obtaining a bursary-supported place at this private school will cost a lot of money for the family but the investment of economic resources (to be converted to cultural and symbolic capital) is considered money well spent by his mum. One reason for this is the perceived reduction in risk (Beck 1992) that concerns Edward's mother in regard to the normal progression to the local comprehensive school. There he might "go either way" but the investment in the private education will help to avoid him going "completely the wrong way". It is unclear what the right way is but it certainly includes a university education and as far as Edward is concerned (at age 10) this could lead to one of two careers:

Edward: When I'm older I'm hoping to be a palaeontologist...about dinosaurs, so you have to do quite a bit of formula maths with that I think...or open a computer software company where you have to do loads of maths...all the complicated stuff

That he is considering such a career (influenced no doubt by a character from his favourite TV show- Friends) is striking enough, but the fact that he can relate this to work that he might be doing now in school is highly unusual. Such employment aspirations and strategic educational vision result from his family context. This is reinforced when Edward's mum was asked about the extent to which she has supported his progress. She describes him as "a self-made man"

Edward's mum: He has really done this all on his own. I never want to be one of these mothers who make them stay in and have extra maths lessons. I didn't want to do that and I don't want to do that now. If at any time Charlie says to me "I'm not happy" then we have to think again. I'm not pushing him that way. I always make sure that he has done his homework and I always make sure that he does his homework in a quiet place.

There are some contradictions here. She does not acknowledge the extent to which her economic and cultural wealth and choice of job have impacted upon Edward; neither does she admit how her support with homework is not natural but the preserve of a certain group of parents (mothers?) who have the time and interest to reinforce the values and priorities of school. Moreover, extra lessons are unnecessary because Edward's dad fulfils this role – not just through using one of the vast array of resources on the market, but by relating mathematics to culture and by learning to think mathematically in a way that might be acceptable to a selective fee-paying school.

This understanding of mathematical power developed through the family is invaluable at this transition point. Although Edward's mum claims to have hated mathematics, she values it (and science) over the more creative, "arty-farty" subjects that she enjoyed and made her career in, despite recognising similar interested in Edward. There are also mixed messages from his dad:

Edward: My Dad absolutely hates maths, when he sees a maths book he goes berserk and runs away from it and my mum hates maths as well. I enjoy maths so I'm the only one really...I've still got a maths book from last year and I've been looking at that and doing sums from it with my Dad and he keeps faking to pass out because he hates maths completely and he's never liked maths even when he was at school he's never enjoyed anything to do with maths.

Yet despite this apparent hatred, the family share a belief that mathematics is useful for future educational and economic success. Mathematics has utility for this family and whether it is enjoyed or not, success is important for access to the family's preferred educational pathway. Although Edward claims to like mathematics the evidence from the classroom is not wholly supportive of this claim. It's clear that he likes being good at it and the sense of distinction that this affords, but he does not have the same level of interest in mathematical thinking as his close friend Matt.

DISCUSSION

School choice is high on the educational agenda in the UK (Gewirtz, Ball et al. 1995; Ball, Bowe et al. 1996; Ball 1997; Ball 2003). Although Edward's parents exercised their right to

move Edward to a different school, Stacey went to the same secondary school as the vast majority of her primary school peers. So although there is no doubt a social differentiation effected at the transition from primary to secondary school case study data like this shows how the diffraction of educational trajectories (Noyes 2006) is already taking place in mathematics education and the classroom experiences of these two children has been powerless to seriously reduce this effect. The case studies show that gender is influential in these mathematical trajectories, but as has been shown here in the UK (Connolly 2006), social class is a much stronger correlate of attainment than is ethnicity or gender.

However, concluding this paper without considering how the socially reproductive tendencies of schools and mathematics classrooms can be challenged would be unhelpful. For although Bourdieu's tools offer a convincing theorisation of the way things are (and social stasis was the focus of his work), they are not so useful in generating emancipatory pathways (Giroux 1983). My interest in this paper has been not so much on the education of marginalised groups but on how school mathematics, as part of the wider education system, can act to confirm and/or create the marginalised status of those in society. That is not to say that it always acts to create distinction but rather that the traditional modes of teaching and pedagogical approaches lack the power to address these issues. I was also not as concerned with between school effects as within school and class effect; how one school can help to reinforce the social difference between members of different social groups, despite the ways in which the school apparently hides their social difference through the conformity of uniform, all ability grouping, common curriculum, etc.

The question remains then as to what mathematics educators can and should do to ensure that English mathematics classrooms, and those in other places for that matter, are not complicit in this inequitable process. Firstly there is a need to understand the processes that tend to reproductive probability (not determinism) and hopefully this paper contributes to this understanding. Bourdieu's argument that treating all learners equally is in fact to reinforce the differences between them is an important point in this regard. In Ernest's (1992) account of the establishment of the NC in England referred to earlier he explains how the 'public educators' were factored out of the discussion by the powerful political, industrial/commercial and academic groups. These Public Educators

...represent a radical reforming tradition, concerned with democracy and social equity...to empower the working classes to participate in the democratic institutions of society, and to share more fully in the prosperity of modern industrial society...

...represent radical reformers who see mathematics as a means to empower students: mathematics is to give them the confidence to pose problems, initiate investigations and autonomous projects; to critically examine and question the use of mathematics and statistics in our increasingly mathematized society, combating the mathematical mystification prevalent in the treatment of social and political issues. (p.36)

So, in response to analyses like this one of how mathematics works in schools, the call must be to the 'public educators' to increase their efforts to extend this debate in order to impact mathematics policy and practice. This happens to a degree elsewhere (Frankenstein 2005; Gutstein 2006) and there are some working to these ends in the UK. Unfortunately, the audit and surveillance culture in which we find ourselves makes it difficult to deviate from the mandated curricular pathways and preferred pedagogies (Ball 2003). Harris (1998, 175) explains that:

...initiatives currently being imposed on teachers are serving, at one and the same time, to reduce the professional knowledge and critical scholarship which underlies teachers' work, and to decrease the political impact that teachers might bring about through instructional activities.

Teachers need to be educated to recognise the political nature of knowledge, the question not only 'whose knowledge is of most value' (Apple 2004) but also 'whose pedagogies are of most value'. Currently mathematics education in England is in the grip of utilitarian functionalism which has disengaged generations of learners. What is needed is a reengagement with political activism. For example, Lerman (1992) called for the development of a Friirian problem-posing mathematics education; Skovsmose and others (Skovsmose 1994; Skovsmose and Valero 2002) argued for 'critical mathematics education' and more recently Gutstein's (2006) has demonstrated how young people can and must learn to read and write the world with mathematics. These are the positions of 'public educators'. Mathematics education in England is currently not the domain of the 'public educators' but unless something changes children like Stacey will continue to be marginalised by school mathematics. On the other hand, those like Edward, who arrive in classrooms with the kinds of mathematical sympathies and family capital that teachers tend to value will be advantaged. His future is apparently secured through merit (particularly in mathematics!), but really the difference between his and Stacey's mathematical trajectory is social distinction.

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