BEING A SUMBODY: NEW STORIES OF CHOOSING MATHS

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Neo-liberalism has led to an expansion of market economics, notably into public sector areas including education. Within this world choice is central. These choices are not only acts of consumption; they are also a means of making one's-self. We look at: What does it mean for students to make subject choices within this framework of compulsory choice and entrepreneurship? And, in particular, how do people choose mathematics in this context? We do this by looking in detail at interviews with 11 people who chose to study mathematics at university.

We live in 'new times' defined by a political framework of neoliberalism. This has led to an expansion of market economics, notably into public sector areas including education (Ball, 2007). Within this world consumer choice is central; it makes the free market function. Theses choices are not only acts of consumption; they are also a means of making one's-self: "individuals are to become, as it were, entrepreneurs of themselves, shaping their own lives through the choices they make among the forms of life available to them" (Rose, 1999, p.230). Thus neoliberalism means that we all make choices in order to choose 'who we want to be', to regulate and govern ourselves in an era of apparent freedom. We are confronted by an array of possible choices, all of which we are asked to make. In education, we see this from choices of schools, to choices of subjects. What does it mean for students to make subject choices within this framework of compulsory choice and entrepreneurship? How do students negotiate choices to continue with mathematics or not within this context?

We use a discursive approach that draws on the work of Michel Foucault. Within this discourses are, "practices that systematically form the objects of which they speak" (Foucault, 1972, p.49). Analytically, this means that we do not ask 'is x true?' but 'what makes x possible?' and 'what are its effects?' For example, we do not ask 'why did someone choose (not) to continue studying mathematics?' but 'what makes it possible for us to think of someone as making a choice (not) to do mathematics?' and 'what effects does this have?' on how we think about mathematics, ourselves and others. Within such approaches, subjectivity replaces identity, to capture the idea of simultaneously positioning one's-self in discourse and being positioned by discourse, both subject and subjected. Power is intrinsic to this process; it "traverses and produces things, it induces pleasure, forms knowledge, produces discourse. It needs to be considered as a productive network which runs through the whole social body, much more than as a negative instance whose function is repression" (Foucault, 1980, p.119). This double-ness in the process of subjection is important when thinking about choices, because so often people choosing are seen as either active makers of meanings, consciously and rationally choosing subjects, or passive consumers of meanings, subjected to the undue influence of the media and other people. However, we see choices as always and inseparably both active *and* passive.

The data and analysis we draw on come from research funded by the Economic and Social Research Council (RES-000-23-1454) and the UK Resource Centre for Women in Science Engineering and Technology. In this research we are using data from a quantitative survey, qualitative focus groups and individual interviews and popular texts to explore how learners construct their identities in relation to popular culture representations of mathematics and mathematicians. In this paper, we draw mainly on the interviews as issues of choice were central to these. We carried out 26 interviews with school students across three mixed comprehensives in England and 23 interviews with university students in a range of institutions in England and Wales (11 final year mathematics undergraduates and 9 undergraduates and 3 postgraduates studying humanities/social sciences).

CONSUMING YOUR-SELF; CONSUMING MATHEMATICS

We asked participants to talk about how they had made their subject and employment choices; we prompted them to speak about the influence of teachers, family and popular culture. However, the most common reasons given for their choices were ones that arose unprompted: identity, enjoyment and ability. So choices are constructed as a way of realising your-self. Although there is an important distinction between reasons given for choices and other ways of understanding how those choices come about, we are interested here in the discourses through which choices can be legitimated. Alongside this investment in choices as self-realisation it was common to play down the role of external influences. For example, participants spoke about discussing their choices with their parents and being supported by them, but simultaneously asserted that they were their own individual, independent acts; while even three people who want to work in the music industry said that popular culture had not influenced their choices. We would argue that these influences are denied because they threaten the production of the autonomous self.

The three central factors, of identity, enjoyment and ability, are interwoven in different configurations in all participants' stories. For example:

> Chantz: [Maths is] not a thing that comes completely naturally to me. If I'm going to do subjects, then I'm going to have to work hard, I should work hard at something that I'm good at or something I enjoy. Not just slog on at something I hate. [Female, White English, working-class]

> Wilbert: I've been generally quite good at English through school. So, you know, that's always been a strong point in my education, I really enjoy it. And music itself, I'm really good at, so I don't know, and I enjoy it as well because it's something that I do. And I'm interested in the technology side of stuff. And I took media studies because it ties in with English nicely, and learn about the media and everything. And I did photography because I've never done it before but I think I will enjoy it because I'm more of a creative person. [Male, White English, middle-class]

Enjoyment and ability are tied to each other in complex ways. Both can function as a foundation for particular choices. In Wilbert's talk we can also see a link with

identity, where his being a particular type of person, 'creative', is used as a predictor of future enjoyment and so as a guarantee for choices, even of subjects in which he has no experience. 'Creative' is part of a powerful discourse that maps onto and into a particular set of subjects. While there is some flexibility, our and other research has found a strong opposition between mathematics and creative subjects. In the next extract, enjoyment and ability are again tied to being or becoming a particular sort of person. Deebo has to be able to occupy a subject identity in order to be successful:

> Deebo: Well these [information technology, business studies, geography] are all subjects like I personally enjoy a lot. … It has to be enjoyable, yeah, coz it's like business studies as well, what I do is like I visualise myself in a situation and then I, I think like 'oh so what would I do if I was ---, knowing what I'd been taught?' So that's how I answer my questions, it's the same with geography as well. [Male, Black African, working class]

Both Deebo and Wilbert talk about themselves as actively engaging with subjects, creating and improving their-selves through this. These are a few examples of many, all come from school students but the pattern recurred among the university students.

Enjoyment and ability, held together by identity, take on a foundational role, carrying with them the promise of good results, good jobs, future success and future happiness. The way that people now choose for enjoyment, ability and identity is related to shifts in how we think about the self associated with neoliberalism. Anne Cronin (2000, p.30) traces the development of modern conceptions of the self showing how it "gradually comes to be seen as a repository of unique and authentic potential which must be realised through processes of discovery, expression, and thus self-actualisation". In contemporary Western societies this manifests as "a process of active 'choice' framed in terms of consumerist engagement with the idea of self as project", which is then "construed as a personal duty and responsibility". Beverley Skeggs (2004) shows that this version of the self is classed and gendered. The position of autonomous consuming self is easier for some to occupy than others.

We shift now to ask: How can choosing mathematics become part of a project of 'compulsory individuality'? This question is interesting given the way that we found that mathematics is constructed as having little room for self, being constructed as rigid with clear answers (see also Burton, 1994). Earlier work on choosing mathematics found that reasons were commonly to do with future job requirements or a desire for intellectual kudos and that enjoyment featured for only a few of those taking mathematics at age 16+ (Mendick, 2006). To explore the ways that people consume mathematics we turn to our 11 interviewees who had chosen mathematics.

For this group too the factors of enjoyment, ability and identity, come out strongly in their talk about choice, featuring in various and complex configurations. For Joanna [female, White Welsh, Russell Group] her loss of enjoyment in mathematics coincided with struggles during her degree, so now she mentions enjoyment only in relation to other areas, such as environmental issues. Bridget [female, White English, Russell Group], Dave [male, White English, Post-1992], Dave RG [male, White

Welsh, Russell Group], Elizabeth [female, White English, Russell Group], Robert [male, White English, Russell Group] and Sophie [female, White English, Russell Group] all spoke about enjoying mathematics and having ability at it:

> Dave: But with maths, I was learning how to do things and everything I was doing I was doing well at. So I just found it was the thing I was skilled at and it was the thing that I quite enjoyed being skilled at.

His continuing with mathematics is constructed not as an active choice but as a finding and expressing of self. Something he always already was. Ricardo [male, Black African, Post-1992] discusses his desire to pursue financial mathematics by imagining his-self doing this, and the pleasure, this provides:

> Ricardo: I can imagine myself one day predicting the movement of the stock … I know I will make a fortune out of it but the, the glory that will come with it would make me feel like I fulfil something. Fulfilment is the most important part. So even though I earn money as well but I just want to enjoy it. I don't like doing something I don't enjoy.

Thus the constellation of enjoyment, ability and identity allows choosing mathematics to become a route to self-actualisation for many of these participants but there are several important differences between the way that story plays out in relation to mathematics as compared to other subjects.

BEING DIFFERENT; STAYING DIFFERENT

For mathematics, ability and enjoyment seem even more closely linked than for other subjects; for Joanna and Dave (see above) they feel interchangeable. A further difference is the way that, for mathematics, ability is constructed as a more important foundation for choices than pleasure:

> Boris: If you're strong at maths, then you'll continue with it. But if you're weak at it, even if popular culture encouraged it, you still won't go into it because you don't feel you're good enough for it. [Male, White English, Post-1992]

For mathematics, ability produces enjoyment in a relationship that is the reverse of that usually constructed for other subjects (for example, Chantz, quoted above, for whom enjoyment enables hard work which leads to success). This different relationship between ability and enjoyment is what enables mathematics to be inscribed as a truth about the self that can be realised through choosing mathematics. However, it means that this choice is not an active work of self-creation; they are more chosen than choosing.

The identity claims around ability and enjoyment often make use of the word always. This applies to many subjects but happens more often with mathematics in our data:

> Sophie: I've *always* liked it and that's why I've *always*. [You like the certainty of it?] Yeah, I think that's – that's probably why it's *always* been my best subject because I've enjoyed that part of it. The thing is like, science and things at school, I *always* enjoyed a

lot more than anything like English. Purely because I was better at them so I put more effort in, really.

Dave RG: I've *always* seemed to enjoy it, like at primary school, we used to get sets of the maths books and there used to be a great feeling of finishing first, getting everything right and just, it was *always* about being picked out, good at that area, and it would just make you feel really good and it's just - maths just keeps making you feel good really.

The insistent use of 'always' is striking. This word, as Judith Butler (1997) argues, functions to inscribe the feelings attached to it as essential characteristics of the self and to disappear the process of coming into the discourse, being constructed as mathematically able. But if choosing mathematics is to be a route to self realisation then, in the context of the large-scale absence of other ways of interacting with mathematics, these things need to be experienced as essential parts of the self. They have to be ones that make you feel different and special when realised or, as Dave RG puts it, ones that "just [keep] making you feel good". In his extract we can see how recognition by an/other is crucial to this feeling of being special. However, this notion of specialness is not innocent. Discursively it relies on the idea that not everyone can do mathematics and that those who can are born with this 'ability'.

In our data, both those outside and those inside mathematics do work to maintain the boundaries between those who are mathematical and those who are not. We offer three examples of this. The first, othering, occurred more in the focus groups than in the interviews suggesting that it is supported by collective subject cultures:

Sky: I know it's a bit over simplistic, but like if people do have areas of their brain that they are more sort of successful with. Just like looking between like sociology and maths like we are better at sort of constructing an argument and that sort of thing, better at theorising. Or maybe just because we have to be but maybe you could argue that we are more used to engaging our emotions and things like that. And so I suppose you could say with some people if their main focus in their brain is on the like mathematical technical side then that might be at the cost of the like emotional.

In part this discourse works through marking the privileged mathematical category as undesirable. For example, Sky suggests that those doing mathematics are less able to engage with emotions. Similarly, 'geek' discourses, which came up often in our data, associate being mathematical with social incompetence. However, it is important to focus on the ways these devices maintain the boundaries between the mathematical and the rest, the higher status of mathematics and so the operation of power.

A marked example of boundary maintenance by the mathematics undergraduates is their responses to our request to imagine a world where mathematicians appear on television regularly. You might think that they would welcome this, and indeed some did, feeling it would be nice if mathematics was better appreciated. However, some did not or expressed reservations. In all these cases, we can read a desire to maintain their difference from others. Sophie likes our current world as she does not mind being seen as a geek, is even amused by it and likes shattering the stereotypes;

Elizabeth says, "maybe I quite like the fact people say with maths, they're different"; Dave RG says, "it feels good … you're one of the few people who can do it"; Bridget worries that there will be more competition for university places so she will lose her place at an elite institution; and, Boris and Alice talk about generally how people would dislike it, perhaps wanting to maintain their difference from others. A final example is the mathematics undergraduates' views on Carol Vorderman, who does mental arithmetic on a long-running UK television game show. All but one of them reacted against her. Four questioned her mathematical abilities, drawing a line between arithmetic and 'real' mathematics. Gendered oppositions between: activities of calculation and of mathematics and calculating and reasoning and their projection onto people are important for maintaining the elite position of mathematician.

FINAL THOUGHTS

First, subject choice does not deliver what it promises and what we may have hoped it would. Second, we argued that specialness is based in discourses that construct boundaries around the mathematical that exclude many from a powerful area of the curriculum and from a range of jobs, resources and positions to which mathematics controls access. Third, the idea of specialness finds support within mathematics teaching practices and beyond, where boundary maintenance work is constantly enacted. In mathematics teaching, use of competition and 'ability' grouping supports specialness. Beyond that, in a recent example the US television series *Heroes* tells interlocking stories of a group of people who have a range of special abilities (http://en.wikipedia.org/wiki/Heroes_(TV_series)). Their abilities are linked directly to evolutionary progress and these special people are the hope to save the world. These practices and their available identity positions in relation to mathematics need to change in order to allow a wider range of people to engage with mathematics.

REFERENCES

Ball, S. J. (2007) *Education plc: Understanding private sector participation in public sector education* (Abingdon, Routledge).

Butler, J. (1997) *The psychic life of power* (Stanford, Stanford University Press).

Burton, L. (1994) Clashing epistemologies of mathematics education: can we see the 'wood' for the 'trees'? *Curriculum Studies*, 2(2), 203-219.

Cronin, A. (2000) *Advertising and consumer citizenship: gender, images and rights* (London, Routledge).

Foucault, M. (1972) *The archaeology of knowledge* (London, Routledge).

Foucault, M. (1980) in: C. Gordon (Ed) *Power/knowledge* (Harlow, Prentice Hall).

Mendick, H. (2006) *Masculinities in mathematics* (Maidenhead, Open University Press (McGraw-Hill Education)).

Rose, N. (1999) *Governing the soul* (London, Free Association Books).

Skeggs, B. (2004) *Class, self, culture* (London, Routledge).