

Streaming in school mathematics: A Bourdieuan analysis

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Streaming, or ability grouping, is a common practice in many mathematics classrooms. Its negative effects on students have been documented in research spanning two decades or more, and yet it is still widely implemented – in some countries even mandated. Using data from interviews with students in the compulsory years of secondary schooling (14-16year olds), and using the theoretical tools offered by Bourdieu, it is argued that the objective practices of school mathematics create an environment through which students internalise the practices to develop a sense of self (a habitus). This habitus potentially is more or less empowering depending on the experiences within these streamed settings.

Grouping students according to perceived ability is a common practice within school mathematics. Indeed, in some countries (such as the UK) it is now mandated. This is in spite of international research that demonstrates the streaming does not enhance learning of students, and indeed, can hinder learning particularly for students in the lower streams (Boaler 1997a, Boaler, Wiliam and Brown, 2000). Why this practice continues, and often with governmental support, and with what effects, needs to be questioned. Using the theoretical tools offered through the writings of French sociologist, Pierre Bourdieu, it is proposed that through the notions of field and habitus, the practice of streaming helps to reproduce the status quo and can be detrimental to goals of social justice. The theoretical analysis of classroom practice is supported by data collected through semi-structured interviews with students from 6 divergent schools in a region of Australia. The interviews were conducted with 108 students (relatively equal numbers of boys and girls) where questions were posed to gain insights into their experiences of school mathematics. What was a surprising outcome of these interviews was the overwhelming experiences of streamed classes, and the impact that these had on students insofar as their relationship with school mathematics. Ten teachers were subsequently interviewed in an attempt to validate student reports. These data and their analysis are the focus of this paper.

In considering the theoretical tools for analysis, I draw on the constructs of field and habitus and preface them by commenting on their dialectical relationship. Bourdieu comments on the relationship between thought and action with the objective world which he represents through habitus and field respectively. In summarising Bourdieu's thesis on habitus, Harker (1992, p.16) argues that as a consequence of past experiences, schemes of action, thought and perception are deposited in the individual and "tend to guarantee the 'correctness' of practices and their constancy over time, more reliably than all formal rules and explicit norms". As a result, the habitus, as described by Bourdieu (1977, p. 95) is "an acquired system of generative schemes objectively adjusted to the particular conditions in which it is constituted." While this position has been criticised as being deterministic and overly structuralist

(Giroux, 1983), Bourdieu and his supporters (Grenfell & James, 1998; Harker, 1984) argue that this is not the case. Rather, they propose that the habitus is a methodological construct that allows the researcher to understand the dynamic structure between social reality and the individual. While habitus is a result of social inheritance (Robbins, 1993) it also suggests a habit or disposition so that it exists almost at an unconscious level. Simultaneously, it is involved in the production of practices (Greenfell, 1998) through the provision of experiences to frame interpretations and new ways of acting in new and novel situations. Through experiences, students (or people in general) come to constitute a habitus that will subsequently predispose them to think, act and interpret the world through particular ways, while also participating in such practices and constituting new forms of practice. For example, one only has to consider the experiences that one has had – either direct or latent – and how these experiences facilitate the construction of particular views of the world and how will is likely to act within that world. This is how the habitus has come to be constructed and how, in turn, it facilitates particular ways of seeing, thinking and acting within that world.

It is not possible to consider habitus without considering field. Since the habitus comes about through experiences, which are mediated through the habitus and become, reconstituted either in terms of the ways in which the habitus reconstitutes the experiences or the constitution of the habitus as a consequence of the experiences. The experiences must be experienced through some social medium – and this social medium is seen as the field. The field, in turn, is governed by particular practices. (Grenfell & James, 1998, p. 15) argue that “if the habitus brings into focus the subjective end of the equation, field focuses on the objective” [and where there is an] “ontological complicity” between the habitus and field. In the case here, the field is seen to be mathematics education. Within this field, there are structuring practices that govern practices within mathematics education – what is seen as legitimate and what is not – and these, in turn, position students within such practices so as to come to constitute a habitus that will predispose them to think and act in particular ways. In the ideal situation, the goal of mathematics education is to expose students to practices that will enable them to see and view the world through mathematical lenses and to be successful participants in this field. However, this is far from the case and in many cases, the converse is true.

Streaming as a practice within the field of mathematics education

Streaming was widely practiced in Australian schools until the 1970s where it was abolished due to its inequitable and suspect outcomes for students. However, in spite of its formal rejection from curriculum organisation, it has remained a dominant practice. In other countries, such as the UK, streaming in mathematics is a mandated practice. In spite of the support for streaming in schools, there appears to be little support for the practice of streaming within the research literature. In their comprehensive review of ability grouping literature,

Ireson and Hallam (1999) claim that there is no conclusive evidence to support or dispute the value of streaming in increasing academic achievement. In contrast, a large-scale study of American youth found that ability grouping helped the advanced, harmed the students in the low streams and overall, had a negligible effect (Hoffer, 1992). Similarly, in her study of middle school mathematics classes, Burkes (1994) noted that students from the high ability classes were more likely to view mathematics positively, engage in appropriate behaviour and to undertake homework than their peers in middle or lower streams. International studies on streaming indicate that placement of students into ability groups widens the gap between the groups beyond what would normally be expected (Slavin, 1990). These studies suggest that there is little benefit for students to be placed in streamed classes, yet the practice (and support for it) still remains. As such, there appear to be forces operating within the field of mathematics education that support the use of streaming for curriculum and assessment differentiation. While the implementation of streaming may be widespread, it appears to be more common in mathematics than most other curriculum areas. This raises questions as to why and how the field of mathematics education supports the practice of streaming. Such support may not be overt, but can also be ideological, and hence less open to criticism.

In considering the field of mathematics education as a practice, questions can be asked of the practices within the field, why they exist and with what effects. Research conducted by Chen and Goldring (Chen & Goldring, 1994) suggests that there is wide acceptance of streaming by teachers. One reason why there is this support can be found in the dominant ideology in mathematics education where it is widely accepted that mathematics is hierarchical in structure (Ruthven, 1987). If it is perceived that there is a hierarchy in the complexity and demands of the discipline, then it would be logical that students can be mapped against this hierarchy. When this is coupled with the contemporary push in education for outcomes-based learning where students' progress is mapped against levels, there is a congruency between the teachers' beliefs about curriculum organisation, student learning and assessment. This enables teachers to justify streaming on the basis that students can be exposed to content that matches their levels of understanding. The hierarchy of learning is further supported through the belief that appropriate learning activities and scaffolding can be developed to move the students on to greater levels of understanding and competence (Slavin, 1990). While streaming may be seen as an anathema to good teaching practice, the ideology of mathematics being hierarchical, in concert with the levelling ideology of outcomes-based education reforms, creates an environment that reifies a learning hierarchy. In so doing, this supports the use of grouping students according to their achievement levels. This ideology provides the structuring practices through which teachers are able to organise curriculum and learning under the guise that the practices that they develop support student learning.

Furthermore, the ideology of ability permeates the practices within the field. Underpinning the justification for streaming is a belief in the notion of an innate ability whereby the students' abilities in mathematics is the major reason for the performance in mathematics (Lorenz, 1982). Notions of gifted children or children with learning difficulties permeate teaching discourses. Underachievement is seen to be the fault of the student rather than social conditions or other factors due to their innate propensity for mathematics. Assessment practices reify ability through scoring mechanisms. These notions are often seen as unproblematic and a representation of the natural order beyond schools whereby some students have natural abilities and that these are assessable through the practices within the field (Herrnstein & Murray, 1994). Accordingly, having students clustered around their 'natural abilities' allows teachers to construct learning activities that match the ability of the students. Part of the rationale for grouping students according to ability is that it makes teaching more effective – in terms of outcomes for students since the curriculum can be better targeted to their levels of understanding or performance but also in terms of making planning and delivery more streamlined for teachers. Lessons are perceived to be conducted at a pace that suits the students.

In spite of a substantial body of research that is highly critical of streaming, as a practice it is embraced by teachers, schools and many education authorities, in part, due to its congruence with widely held beliefs about 'natural abilities'. Yet, as Apple (Apple, 1993; Apple, 1995; Apple, 1996) has been highly critical, the teaching profession has been deskilled, proletarianised and suffering from over intensification of work so that there is little opportunity for teachers to critically appraise dominant practices. For many teachers, there is a need to embrace practices that will enable them to survive in the best ways possible. Streaming is a practice that resonates with dominant beliefs about ability and allows for the implementation of practices that support these beliefs.

Bourdieu and Wacquant (1992) discuss the reflexivity of field and habitus. Considering mathematics education as a field whereby it is structured system of social relations in and through which individuals and institutions exist in relation to each other. The field structures the habitus – that is, the practices within mathematics education influence the construction of particular dispositions within teachers and students. In turn, the habitus "contributes to constituting the field as a meaningful world" (Bourdieu & in Wacquant, 1989, p. 44). In considering the implications of this insofar as mathematics education and streaming, the practices to which the teacher as a student and then later as a preservice teacher and a graduate has been exposed are historically grounded and have potential for the teacher to incorporate these experiences of teaching into a habitus. In turn the habitus provides the lens for constructing the learning environment for his/her students. Inevitably, the experiences of the developing teacher shape his/her views about how best to organise for learning. In the current educational climate, there is a dominance of psychological discourses; views of social justice that focus on liberal, individualistic perspectives; and a

view of mathematics being a hierarchical ontology. Within a field such as this, there is considerable influence for constructing a habitus that would legitimate practices associated with grouping students according to need and ability. This is evident in the comments offered by some of the teachers:

Ms Hoskings: I think they're trying to teach too much, and just getting a bit of an impact in a lot of different fields and not sort of focussing on what's really important, which may mean streaming the kids a lot earlier, so that we can more tailor make a program for them. (Teacher Beechwood)

Mr Bradshaw: The new syllabus (outcomes-based) is a great idea as it will allow us to map students against the levels and then to stream them as to their ability. We will be able to do this very early and then to organise the right content to match their ability. (Teacher, Huon Pine)

As these comments indicate, the field of mathematics education provides practices through which both teachers and students come to construct a habitus that provides particular ways of seeing the world of mathematics. In turn, this habitus predisposes participants to act and think in particular ways. For the teacher, his/her experiences as a student and beginning teacher, the experiences position him/her to perceive mathematics education in particular ways, thus allowing for a certain degree of reproduction of the discipline (but also transformation).

Streaming and the construction of a school mathematics habitus

The responses offered by the students fell into two clearly defined categories depending on whether they were in the high-streamed classes or the low-streamed classes. This was not an anticipated outcome of the research so was considered to be an important finding. In line with other research cited earlier, the responses confirmed the general trend that students in the high streams reported positive experiences; learned a lot of mathematics; performed better in tests; and considered the discipline as relevant. The converse was true for students in the lower streams. It is worthy to note that these trends held regardless of the school, the year level or gender. Briefly, consider the following comparisons.

Assessment

Students discussed exam preparation and the ways in which teachers organised the content to be taught. The examination process consists of three levels of questions that vary in complexity and application. In most cases, the students in the high stream classes reported that they would enter the exam knowing that they had passed and were only required to attempt the higher order questions in order to gain higher grades:

Marcus: I like being in this class as we have covered all of the work that is going to be on the test. I know that I have passed and just have to do the application questions to get a HA or VHA [different grades]. (Melalucca, Year 9)

In contrast, the students in the lower streams commented on not having covered all of the content and just being able to pass the exams:

Melanie: In our class we only cover the core content so I can only do questions 1 and 2 on the exam. The others I don't know how to do as we have not done them in class. These are the questions that get you higher marks and we can't do them so the most I can get on the exam is a pass. (Beechwood, Year 10)

Other students confirmed the disparities between the classes recognising that the higher streams were exposed to more complex content and hence higher grades whereas the lower streams were excluded from answering the higher order questions as they had not encountered the content.

Thomas: Some of my friends are in different [low stream] classes have said they do easy work and they don't do the hard work so when the hard work is on the test, they can't do it because they haven't learnt it. (Year 10 Huon Pine)

In terms of the relationship between habitus and field, it can be seen that the students are cognisant of the structuring practices within the field – they are located within practices that are facilitating or hindering their capacity to gain particular grades in mathematics. By exposing or denying them access to knowledge that will be examinable, some students are located within practices that facilitate potential for success while others are being denied this access. Insofar as this being realised into a mathematical habitus, the frustration with the practice is evidenced in the comment below:

Simon: Most of the time the stuff on the exam we haven't covered. Most of the time she says that it is not her fault that we haven't done the stuff on the exam. [She says that] it is our fault that we didn't get to cover it. I get really pissed off with that. (Beechwood, Yr 10)

Here Simon is articulating his frustration with the process of examination of content that has not been introduced to the students. He indicates that he is angry that the teacher blames the students for not covering the content. The experiences of the lower stream students of being locked out of higher grades was articulated by most of the students and many were angry about the process. These negative experiences of mathematics have the potential for students to construct particular views about school mathematics and their relationship with it which become internalised as part of the habitus, thus providing particular ways of seeing school mathematics.

In light of these comments, serious questions need to be posed about the validity of assessment and subsequent grading of students. This in turn raises serious questions about notions of ability and its social construction. For the students in the high stream classes, this is not so much an issue. However, for the students in the lower streams, they are excluded from engaging in examinable content and thus their grades are being restricted and, in the long term, they are locked out of success. How this impacts on their relationship with school mathematics should be questioned. However, it is not simply a case of

blaming teachers as there is a need to consider the mutualistic construction of the field. The field is not an objective structure divorced from the subjective. In the case of mathematics classrooms, the field is influenced by the participants who are engaged in the dynamic construction of the same.

Classroom ethos

From a teachers' perspective, teaching in the lower streams is often a challenge. Teachers often bemoan the behaviour management in low stream classes, often placing the blame on the students for the disruptive behaviour. This was evident in the comment offered by Simon (Beechwood) in the latter section where the teacher blamed the students for her not being able to cover the content. Offering a counter-explanation, Rutter, Maughan and Ousten (1979) suggest that where there are too many students unlikely to succeed in school as a consequence of streaming, there is a greater risk of the students developing an anti-authority peer group. They contend that placing groups of students into one class where they are likely not to succeed, there is a strong risk of excessive behavioural problems. While Rutter et al do not use the work of Bourdieu to theorise this phenomenon, it can be seen that students, as a consequence of the structuring practices within the field, are likely to construct particular habitus depending on their experiences. From the responses collected in this project, it was clear that many of the students engaged in

Michael: The class is always quiet because we have the Head of Maths for the whole school, so no one really mucks around. (Yr 10, Huon Pine)

Stephan: We are lucky in our class – we have the Head of Department and he is really good. We don't muck around as he is pretty strict but he is a good teacher. He explains things well and if we don't understand he goes through it again. (Yr 10 Pine Bark)

These comments resonate strongly with the comments offered by most of the students in the high streams – they commented on having very good teachers (often the Head of Department) and that the ethos in the classroom was very work orientated. Others also commented that they were very pleased to be in the higher stream rather than the lower streams as they felt that the counter was true.

Jackie: We have to work hard in our class, but I enjoy the challenge. Some of my friends are in the other [lower] classes and they have teachers who can't control them and they do really easy work. I am so glad to be in this class (Yr 10, Melalucca)

Steven: I prefer to be in the higher class because you don't get interrupted all the time by all the idiots. There are not as many idiots in it [the classroom] that muck around all the time. It's harder compared to what it would have been for the easier class. We're not allowed to talk as much. We don't get away with much talking compared to other classes, like the lower classroom (Pine Bark, Yr 10).

The practices of streamed mathematics ultimately become internalised as part of the habitus. In the cases cited here, students have discussed the field of mathematics and how it was substantially different depending on the level of streaming. These experiences become internalised so as to provide a lens for

seeing and interpreting the world as well as guiding actions. As has been shown through the comments offered by the students – in both upper and lower streams – the practices within these streamed classes were substantially different. Students in the higher streams commented on having better teachers, being able to gain higher grades due to the content covered, greater support for examinations, and so on whereas the converse was perceived to be the case by the lower streamed students. The practices to which they were exposed created a particular reality for them insofar as what was school mathematics. This is internalised into the habitus so that they come to have particular views and dispositions towards school mathematics. This, in turn, can come to create particular learning environments for the students. Consider the comment by the two students below from the same class:

The dialectic between the teachers and the students can be seen to be the interaction between the field of mathematics education and the habitus that the students can construct in regards to mathematics. Consider the comment by Marcus (below):

Marcus: Well, we have a teacher who can't control us and he doesn't teach us anything so why would you want to be there. I think he might know what he has to teach us, but he doesn't teach us anything. We muck around and try to get him off the lesson. At least it makes the lesson a bit more fun. (Beechwood, Year 9)

Here Marcus comments on the field – the teacher who has little or no behaviour management, who does not teach the students “anything”. This creates a particular view of school mathematics – which in turn has facilitated the construction of a habitus that is rejecting the practice of school mathematics. Similar comments offered by Becky (below) reinforce the comments offered by Marcus:

Becky: I get so annoyed with the teacher. He listens to the boys and they just try to distract him all the time. We don't learn any maths. I would like to be in the top classes coz they get the good teachers and they can learn the stuff and then do well in the exams. We are lucky if we can pass. We're not idiots but the teacher think we are.

In this class, the students appear to be given a teacher who is unable to manage the class and has poor strategies for teaching content. The misbehaviour that is often cited by teachers as a difficulty when working with low streams may be a consequence of the practices within these classes as the students have been able to identify as problematic for their learning. According, the practices of the field have constructed a particular habitus for these students that involves the rejection of school mathematics which in turn results in them behaving in particular ways in these classrooms, which in turn results in the teacher interacting in particular ways. The dynamic of field and habitus becomes evident. The reciprocity between the structuring practices (streaming) and the subjective experiences of the students need to be considered in concert with each other.

For these students, the field – mathematics education – has placed them in practices where their learning is restricted. In part, this is through the practices of the teacher and the streamed practices of the school where particular students have been grouped together and exposed to a particular curriculum and assessment regime. In turn, the students (and teachers) have come to see and act in these classrooms in particular ways.

Ultimately, it is possible, that through the practices within the field, streaming constructs a habitus that excludes students from wanting to continue with further study. Consider the comments offered by the following students from lower streams when asked what could be done to make mathematics better.

Simon: The only thing you could do with maths to make it better would be not to do it!
(Beechwood, Yr 9)

Matt: Nothing – you just can't make maths better it is just so bad. (St Michael's, Yr 10)

These comments suggest that the students have internalised their experiences in the lower streams so as to constitute a disposition towards school mathematics that will be disempowering for their long-term success in school. As students have clearly noted, their experiences in these classrooms come to frame their realities of school mathematics, and ultimately shape their decisions about its value and place in the school curriculum. For all students in the low streamed classes, mathematics was their least favourite subject. This indicates a highly problematic relationship between their experiences of school mathematics (the field) and these become internalised (habitus) to ultimately frame their perceptions of the field.

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