Pedagogy, discourse and identity

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Introduction

Under the influence of sociolinguists (e.g. Halliday), philosophers (e.g. Wittgenstein), psychoanalysts (e.g. Lacan), post structuralists (e.g. Foucault), cultural psychologists (e.g. Vygotsky), cultural studies (e.g. Barthe, Rorty) and others, the last (at least) sixty years of intellectual thought have witnessed a linguistic turn. By this is meant a view of cognition, affect, culture, knowledge and its acquisition, as being mediated by language. Sfard (2007) uses the term ‘commognition’ as a device to distract readers from slipping into fragmenting language from knowing as two distinct but connected processes or aspects of consciousness and, instead, to see cognition, indeed consciousness as a whole, as identical with language and communication. Language precedes us and we learn what things signify from parents, peers, teachers and texts. Since language is culturally and temporally relative, as well as multiple across the communities within which an individual develops (gender, class, ethnicity, religion, race, physical location, sexual orientation, etc.) any individual is a unique collection of subjectivities. One can call this a strong linguistic turn, in that consciousness is seen to be constituted in and framed by language. Seeing language as affecting thought or as a tool to express thoughts might be called a weak role for language. One could refer to this shift also as a discursive turn. I take discourse to be more than language, whilst paradoxically it can only be carried in language (where else?). Discourse carries with it notions of regulation, of the power/knowledge duality of Foucault and it is important to retain the connection rather than view language as rather benign and neutral, a conveyer of thought that is somehow prior and more essential than language.

The subjection of an individual to a discursive form is established through a pedagogic relation, which necessarily involves regulation through systems of power and control. Bernstein (2004) illustrates the nature of the pedagogic relation by giving two alternative responses a teacher might give to a child’s drawing of a person with some body parts missing. He characterizes an explicit or visible pedagogic relation by the teacher praising but pointing out that humans have two arms, two legs and so on. He characterizes an implicit or invisible relation by the teacher merely praising. These different relations will establish different forms of power and control. In my recent research I have been working with the theories of Bernstein (e.g. 2000) and have found they offer a strong framework (through a relatively strong grammar (Bernstein, 1999)) for studying the regulation of learners (acquirers) in pedagogic relations (see e.g. Lerman & Tsatsaroni, 1998; Tsatsaroni, Lerman & Xu, 2003; Morgan, Tsatsaroni & Lerman, 2002; Lerman & Zevenbergen, 2004). Bernstein acknowledged the linguistic turn through his early study of Vygotsky, as one sees in these two quotes, one of them from the chapter on sociolinguistics in his last book:

From Vygotsky and Luria I absorbed the notion of speech as an orienting and regulative system. (Bernstein, 1971, 122-3)

I came to the study of language by a diverse set of routes driven by the inadequacy of sociology to provide an orientation… I drew on the work in U.S. cultural anthropology, Russian work on speech as an orienting and regulative system (Luria and Vygotsky)... (Bernstein, 2000, p. 145)
The mutual support provided by Bernstein’s sociology and Vygotsky’s cultural psychology is no accident. They were both inspired by Marx and, in particular, his perspective on the centrality of social relations in the formation of identity:

It is not the consciousness of men that determines their being but, on the contrary, their social being that determines their consciousness (Marx, 1859/1970, 328/9)

Where Bernstein focused on the access of people to symbolic control, that is power by virtue of high status positions in society (e.g. doctor, lawyer, academic) differentiated by the acquisition of an elaborated or restricted linguistic code, Vygotsky drew on Marx’s statement to provide the mechanism through which culture determines consciousness. Vygotsky called for a unit of analysis that incorporated both cognition and affect, providing the possibility of accounting for human learning and behaviour that goes beyond Bernstein’s strictly structuralist framework.

The ESRC seminar group’s theme, and that of this book, is centrally concerned with explicating the notion of identity in relation to the teaching and learning of mathematics. Once again it can be argued that there is a confluence of orientations towards the study of identity. First, it has become a common focus of attention in the social sciences in general. In 1996 (p. 1) Stuart Hall said, “There has been a veritable discursive explosion in recent years around the concept of ‘identity’”, to which Zygmunt Bauman (2001) added, “The explosion has triggered an avalanche.” I suspect that they are pointing both to the usefulness of the notion in studying human behaviour and to its somewhat excessive appearance in current writing, both academic and popular, becoming a fad or fashion. In popular writing it has become more common to ask who one is or who one wants to be rather than what one does or what one wants to do. The strap line of my University is ‘Become who you want to be’, a reference to identity as goals and aims, not what one wants to do or achieve.

One must look also at the sociological literature for the focus on life possibilities too in this period of late capitalism. In the literature of reflexive modernity (e.g. Beck, Giddens & Lash 1994) some writers claim that individuals are freer to write their own life scripts in this period than in previous periods that they call traditional and early or first modernity. In these earlier periods people’s identities were typically determined by family life and location, and by occupation and social class respectively. Giddens and Beck particularly claim that now individuals can choose who they wish to be, and are able to write their own life scripts, engaging in the project of the self, which is also termed by some as de-traditionalisation. Beck tempers the freedom of choice that Giddens emphasizes by talking of the risk society, in which one is forced to make decisions and changes by the inherent risks of the fast pace of development of society in late capitalism. In Boaler and Greeno’s (2000) study female students’ choices not to go on to study mathematics at University because the identity of mathematicians is perceived by them to be one that does not fit with their perception of their own identity, or the person they wish to be seen as, is perhaps an example of identity work in late modernity. Others argue that structures, such as gender, continue to play dominant roles in identity formation, and question whether we are in fact seeing a de-traditionalisation. Instead they argue that we are seeing a re-traditionalisation whereby old roles may be changed and extended but do not disappear, particularly gender roles.

Second, Jean Lave, whose work has become almost ubiquitous in research in the mathematics education community (although used in ways that can be more or less
productive, see Kanes & Lerman, 2007), argues for a shift in the language for describing learning from ‘cognition’ to that of identity.

We have argued that, from the perspective we have developed here, learning and a sense of identity are inseparable: They are the same phenomenon. (Lave & Wenger, 1991, p. 115)

Looking at young people outside of schooling for the moment, one cannot but be aware of the manifestations of identity throughout their lives, whether it be in the clothing they wear in the desire to conform, to identify with a sports team or sports star, or with a media star, or as expressed in the music they listen to, through which, in their choices, they express conformity to one group or another, or perhaps resistance to conformity. One notes that there are racial and cultural styles of dress, speech and gestures which students may adopt, sometimes independent of whether they ‘belong’ to that social group or not. In the outward expression of religion, through dress, we again are strongly aware of identity and identification and the struggles that are engaged in by that form of expression. In the most recent times young people are able to develop alternative lives in virtual worlds (actually people of any age, but this author is revealing his reluctance to engage with virtual worlds to this extent) where they take on identities and build environments and interact with others as and whom they choose.

In the school context, research studies of gender, ethnicity, social class etc. demonstrate the struggle for identity, acceptance and, sometimes, just a peaceful path through childhood and adolescence and through schooling in particular (see e.g. Kehily, 2001; Reay, 2002).

Looking briefly to research in mathematics education on identity, perhaps the most extensive work has been carried out by Boaler in a series of studies and publications (1997; 2002; Boaler & Greeno, 2000). Others include: Bibby (2001); Mendick (2003); Graven (2003); Bartholomew (2005); and Sfard & Prusak (2005) and Lerman (2006).

In examining identity we must also take note of the effects that the regulatory systems of the state play in the identity of teachers and pupils. Ball (2001), for example, uses Baudrillard’s notion of ‘performativity’, to describe the ways in which people are finding themselves responding to the dominating official regulation in the UK. He describes a self-regulation that differs from the panopticon of poststructuralism:

Instead it is the uncertainty and instability of being judged in different ways, by different means, through different agents; the ‘bringing-off’ of performances – the flow of changing demands, expectations and indicators that make us continually accountable and constantly recorded. (p. 211/212)

He quotes from Jeffrey and Woods’ (1998) interviews to illustrate the impact of regulation on teachers’ identities:

I don’t have the job satisfaction now I had once working with young kids because I feel every time I do something intuitive I just feel guilty about it. ‘Is this right; am I doing it the right way; does this cover what I am supposed to be covering’. (p. 213)

My first reaction was ‘I’m not going to play the game’, but I am and they know I am. I don’t respect myself for it; my own self respect goes down. Why aren’t I making a stand? (p. 215)
Pupils’ identities in relation to mathematics are, of course, largely formed in classrooms, although at any time other aspects of their identities may come to the fore, as referred to above, and there may well be activities and interaction outside the classroom that play a part in their mathematical identities (Winbourne & Watson, 1998).

I will now turn to an examination of the learning of school mathematics from the perspective of the formation of identities. I am looking here to discuss the identities we might want students to acquire in the mathematics classroom.

**School mathematical identities**

I have used the term ‘school mathematics identities’ to acknowledge the recontextualisation that takes place when government, curriculum designers, textbook writers and teachers construct the activities of the mathematics classroom. As Bernstein indicates (2000, p. 31) this process is always imbued with values, what one chooses as necessary, desirable or appropriate for pupils to acquire. In this section I will offer some examples of classroom interactions that, it seems to me, illustrate the value of using the notion of identity to characterise the positions that students take up in the course of mathematical activities.

**Example 1**

Bernstein points out that students must acquire the appropriate recognition and realisation rules, knowing what things are when one encounters them and knowing what one is required to produce, in the pedagogic activity. He shows further that in student-centred classrooms, what he terms a liberal-progressive pedagogy, these rules may be hidden, to the disadvantage of students from working class backgrounds. Children from middle class backgrounds have generally acquired these rules in their home lives and know how to ‘read’ those tasks. For example (Lerman & Zevenbergen, 2004):

The following task was taken from a series of interviews with students from a range of schools and year levels (Zevenbergen, 1991). The students were interviewed individually and asked to respond to the tasks.

Suppose you had a garden this shape and you were in a helicopter right above your garden looking down on it.

Which of the following shapes would be like yours?

![Shapes]

While many of the students were able to respond to the task correctly, it was more likely that, when incorrect responses were offered, they were from students from working-class backgrounds. Typically, incorrect responses involved answering the question as if it were a task involving identification of the shape of their gardens at home. For example:

Robyn: Why did you take that shape [the square]?
Girl: Because is looks like the shape of my garden.
R: Is your garden at home like that?
Girl: Yes.
Boy: None of those.
R: Why aren’t any of them the same?
Boy: My garden goes like that [draws a semi-circle in the air].”

Pupils are to recognise the task as one about shapes in mathematics, not about real gardens, and to know that the answer, that is, giving the appropriate realisation of the task, is to come from within the language of mathematics. As Cooper & Dunne’s (2000) study of students’ performance on standardised test questions set in everyday contexts shows, social class effects are interfering with students’ presentation of their knowledge by calling up the everyday rather than the required ‘esoteric’ mathematics. These students have not learnt to read the task as a school mathematics task. Where students have not acquired the recognition and realisation rules their identities do not converge to that of privileged school mathematics identities but remain in the everyday. The elaborated language, or code, that middle class students acquire in the home means that they can develop the privileged school mathematics identity more easily, seeing contexts as, for the most part, jokes or irrelevant distractions Hasan’s (2002) work on visible semiotic mediation or the informative mode in the home of middle class children also supports this. Acts of localised pedagogy are present where the explicit transmission of ‘knowledge’ is made apparent in the discourse.

Drawing on the different discourses from home life and the forms of pedagogy as framed by the (mathematics) classroom Bernstein’s account provides an explanation of key aspects of the development of identities of teachers and students. It stops short, however, of affect and emotion (Adler & Davis, 2006) and hence does not provide a way of analysing other discourses and identities that may come into play for any student or teacher.

Example 2

The second example is not focused on the disadvantage that working class students experience in invisible pedagogies but instead looks at what may be the effect of weak boundaries between mathematics and other school subjects, in this account design and technology in particular. As part of a research project to study year 7 pupils’ mathematical problem solving the following task was set:

Dear Design Team,
We are about to launch a new product onto the market. The product is a new breakfast cereal and we are looking for a design for the box which will contain the cereal. There are several important criteria for the box: it must have a volume of 120cm$^3$ to contain the amount of cereal we want to include in one unit; it must be easy to stack on shelves in a supermarket and easy for customers to handle. We would like the design of the box to be an appealing. We would like the box to be as cheap to produce as possible, so we are looking for a design shape and one that prospective customers will find attractive which does not use too much card. If you would like to win the contract for this work please supply us with a brief report which should include your design for the box (including a scale drawing of the net of the box) and the reasons for the choices your team has made. We are looking forward to receiving your report and hope that we can work with you in the future.

Our (the teacher and the researchers’) expectation was: that the pupils would try and construct cuboids or other familiar solids with the required volume; that they would soon realise that 120 cm$^3$ was far too small to be practical and would raise the problem with the teacher; that they would investigate the factors of 120, and so on to

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1 British Academy Award No. SG 40073 “Mathematical problem solving in Key Stage 3: researching mathematics in the classroom” co-directed by the author and Leone Burton
other recognisably mathematical activities. In fact almost all the pupils designed wonderful, colourful, unusual, even bizarre shapes to satisfy the request for an ‘appealing shape and one that prospective customers will find attractive’, shapes whose volumes they (and we) could not easily calculate. Only one group of pupils realised the problem of the small volume and they spent the rest of the lesson writing a letter to the company pointing out their error and asking for a new target volume.

In this case, whilst the weakening of the boundaries between subjects in school may have some advantages, and the potential for cross-curricular learning is desirable, pupils (and teachers) may have problems identifying the specifically mathematical. Bernstein discusses the problems for teachers’ identities in what he calls an integrated curriculum but this example indicates pupils’ confusions too. Where what constitutes school mathematical activity, as distinct from other subjects in the school curriculum, is clearly demarcated students (and teacher) can develop a clearer sense of what they are supposed to do in any activity and hence can be acculturated into a school mathematical identity in that space, at that time, as they are engaging in those activities. Where the boundaries are weak, the curriculum being built around common themes or projects, identities can become confused and blurred.

Example 3

Teachers will try to establish norms of interaction in the classroom that they deem appropriate. In the third example (Finlow-Bates, 1997, p. 174) these first year undergraduate computing studies students whose mathematics is not strong are engaging in problems on limits, a topic in their foundation mathematics course. Whilst the students travel down a false path, as teachers we may well be happy with the nature of their style of argumentation as being typical of mathematical thinking, involving conjectures, deductions and refutations whilst at the same time showing respect for the opinions and ideas of others. They are working on the two infinite sums: $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \ldots$ and $\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} + \ldots$

The next sentence in the conversation draws the group back together when Phi\(^2\) … puts forward a bold “naïve conjecture” regarding the sum of any series:

Phi: Well. I think you double the original figure. Like a half will always be equal to 1. And your 1/3 will be equal to 2/3. That’s what that means, isn’t it?
Kappa: No, it looks like it’s converging to 1/2.
Mu: But how come 1/2?
Phi: It can’t converge to 1/2.
Delta: It can con…
Phi: You’re on a half there, aren’t you? You’re coming up to 1/243, 1 over …
Kappa: Yeah, I mean the numbers are so small, the numbers are getting smaller and smaller.
Phi: It’s the second term ..
Kappa: And smaller.
Phi: …, that there makes sense to say that the sequence goes, converges to 2/3, doesn’t it?
Kappa: Yep?
Delta: Yeah.

These students have acquired from their University tutor or from previous mathematics teachers a way of working with mathematical tasks in groups that conforms to the kinds of interactions that would be seen at least by the University tutor, who is also the researcher, to be desirable ones of mathematical argumentation.

\(^2\) The researcher is analysing the data using a framework drawn from Lakatos’ (1978) “Proofs and Refutations” and hence labels the students as he did, using Greek letters.
The tutor has an elaborated sense of what constitutes being a mathematician and is keen to induct students into the behaviours and ways of thinking required. Whilst the research did not engage with issues of how the students understood the nature of their activity I suspect that they might well have described it in terms of what one does when doing mathematics. They could be said to have adopted identities of mathematicians, at least in the terms set by the tutor, in the particular institution (Chevellard, 1992).

**Concluding remarks**

What is gained by working with a notion of identity? Research on mathematics learning and teaching has always looked at the processes whereby students acquire knowledge, skills and understanding. From the account above of the role of forms of pedagogy and the determining function of discourse in the development of consciousness, what does ‘identity’ enable? In the examples above I have tried to indicate that students and teachers have aims and goals and desires that they take into the mathematics classroom. For the teacher, and one hopes for some of the students at least, the main aim is to acquire school mathematics knowledge, sufficient for the goals of the students (to gain at least the minimum accreditation; to know enough for further study; etc.). That knowledge includes concepts and structures, conventions, processes, skills, pleasure, satisfaction and frustration, aesthetics, a sense of wonder, and perhaps other aspects of mathematical activity that have been recontextualised into school mathematics. I want to argue that ‘identity’ potentially incorporates all these into a unit of analysis, whereas other terms, such as cognition, achievement, and performance are partial. Envisaging the process of induction of each student into the mathematics classroom as gaining a school mathematics classroom identity may focus the teacher’s attention on the whole person and their becoming, rather than part of the person and their knowing. The attention of the teacher may thereby be drawn to the discourse of the mathematics classroom, with the recognition and realisation rules, and the effects of forms of pedagogy on different groups of students. Finally, the teacher may become aware that identity is multiple, and whilst I have focused here on the mathematical identity that will be the aim, students will have other overlapping goals and desires at the same time.

**References**


