

Gender, Class, and Subjectivity in Mathematics: a Critique of Humpty Dumpty

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There is a certain dualism which pervades discourse in the teaching of mathematics — indeed, which may be endemic in educational discourse generally — a dualism which opposes the curriculum, on the one hand, and the student, on the other, and between which stands the teacher as broker. The student, in this conception, comes to the classroom with certain individual needs and qualities and these are to be matched by or, in the worst of cases, frustrated by the curriculum. This dualism is particularly apparent in the newly established UK National Curriculum [DES, 1988a; 1988b; 1989] which clearly locates the facility for development within the individual, whilst placing in the mathematics curriculum the means of measuring it [Dowling, 1990a]. Ironically, this dualism is also apparent in a paper which carries the title “A Foucauldian analysis of mathematical discourse” [McBride, 1989], a title which suggests a rather different approach, since the tendency to separate the knowing subject [1] from the social domain is crucially problematized within Foucault’s own writing [2]. In particular, the notion of “role” as used by McBride — and which is substituted for Foucault’s term “subject” — involves an essential voluntarism in that “role” is open to rejection [3]; *subjectivity*, on the other hand, is entirely constituted by and within social practices.

In this paper I want to break with the student/curriculum dualism by considering how the mathematics curriculum, in particular, might be understood as contributing to the constitution of the subject. Rather than considering students as having cognitive styles as individual properties or traits, I want to understand them as being categorized in terms of (for the purposes of this article) gender and socioeconomic class, both being social rather than psychological classifications. Instead of attributing to biological females a feminine cognitive style [4], I am asserting that the stereotypes presented in McBride’s paper — “a feminine cognitive style represents centredness, empathy with subject and nature, and blurred boundaries between knower and known” [McBride, 1989: 40] — are themselves social products, they represent part of what it means to be female or male within social practices, including the discursive practice of writing in journals such as this. To our reading of mathematical curriculum texts, we bring our awareness of these meanings — these are the intertextual connotations that enable us to make sense of any text; relationships within the texts can then be understood as adding to these meanings, restating or recontextualizing what it means to be female or male, working class or middle class, and so augmenting subjectivity. The texts to which I shall be mostly referring are those

which are most commonly used in secondary schools in England and Wales, the School Mathematics Project scheme *SMP 11-16*, published by Cambridge University Press. I shall consider the constitution of the subject in these and some other texts firstly in relation to gender, and secondly in relation to social class.

Gender and mathematics texts

In the original SMP “numbered” series, *SMP Book 1* [5] makes use of the following metaphors to introduce the mathematical topic “rotation”

When your mother does the weekly wash, she probably uses a wringer or spin dryer to remove most of the water from the clothes, and your father probably uses a screw driver, a spanner and a drill to help do odd jobs about the home [p 54]

The gendered domestic “code” [6] which is invoked here might be illustrated as a Venn diagram (Figure 1)

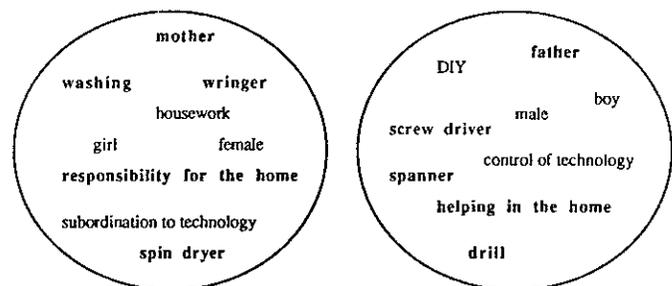


Figure 1

The elements in bold can be read more or less directly from the text, “responsibility for the home” arising as a consequence of the father “helping”: whom he is helping; the mother is not helping [7]. The other elements are intertextual connotations of the extract “Father” and “mother” clearly connote “male” and “female,” respectively and “boy” and “girl” (schoolboy and schoolgirl) in terms of their origins “Washing” and the sequence “a screw driver, a spanner and a drill” connote “housework” and “DIY” (do-it-yourself) respectively [8]. The connotations “subordinate to technology” and “control of technology” obtain because of the relative task dedication of wringers and spin dryers compared with screw drivers, spanners and drills. “Subordination” is particularly associated with the spin dryer (and to an even greater extent with the modern equivalent) in that

the housewife must wait for it to finish its cycle [9]. The reading of the piece of text thus partitions not just mothers and fathers, but (school)girls and (school)boys who are respectively associated — through the text and its intertextual connotations — with domesticity and subordination to technology, on the one hand, and activity outside the domestic sphere (the father is only “helping” in the house) and technological control, on the other. The further connotation of technology with the more erudite aspects of mathematics facilitates the definition of female and male students as, respectively, alienated from and associated with erudite mathematics.

Two important points must be made. Firstly, the emphasis here is on the construction of female and male students within school mathematics rather than on whether or not the text provides “appropriate role models” for girls (and boys). The text contributes, through its internal structure and external relations, to what it means to be female/male. Secondly, the SMP text is not to be held entirely responsible for this meaning: the gender codes always already pre-date the text and enable its reading [10]. The function of the text is to reproduce patriarchal relations in the context and through the elements of school maths so that the gender structuring of society is dyed in the wool of mathematics education [11].

Because of the dialectical nature of the masculine-feminine relationship, that is, “masculine” is defined, principally anyway, in opposition to “feminine,” in rather the same way as Hegel saw “master” defined in opposition to “slave” [see Heilbroner, 1980], a text need not draw explicit contrasts between the genders. *The mathematical experience* by Davis and Heirsh [1981] includes sixty-six pictures of mathematicians (including one of each of the authors, on the dust jacket) precisely none of which are images of women. Furthermore, as far as I can see, there is no reference to a female anywhere in the book and the expected gender of a mathematician (and that of a mathematician’s student) is quite apparent in the authors’ choice of pronoun:

the mathematician regards *his* work as part of the very structure of the world, containing truths which are valid forever, from the beginning of time, even in the most remote corner of the universe

He rests *his* faith on rigorous proof; *he* believes that the difference between a correct proof and an incorrect one is an unmistakable and decisive difference. *He* can think of no condemnation more damning than to say of a student, “*He* doesn’t even know what a proof is.” Yet *he* is able to give no coherent explanation of what is meant by rigour, or what is required to make a proof rigorous. In *his* own work, the line between complete and incomplete proof is always somewhat fuzzy, and often controversial [Davis & Heirsh, 1981; p 34; my emphasis]

and so it carries on [12]. Every instance of a masculine image or name or pronoun invokes its absent other which is feminine; the opposition is always already present within the intertextual connotations of “masculine.” But the book is about erudite mathematics where, clearly, the feminine has no place. This alienation from mathematics is part of the meaning of femininity and, through connotation within the school, constructive of the female student

The most recent edition of the SMP secondary school materials — *SMP 11-16* — illustrates a third possibility by placing masculine and feminine images, names or pronouns in contexts which appear to defy the patriarchal connotations described above, the following examples are taken from *Book B2*

Thomas did some shopping in a supermarket. The bill came to £14.47. When he got home he found he had been charged £5.39 for a joint which should have cost £3.59. What should his total bill have come to?

An architect is designing a house . . . *she* wants the three spaces marked S to be of equal width . . .

A van driver leaves a shop. *She* has to deliver packages to four houses and return afterwards to the shop.

A policewoman is keeping a lookout on an empty house. She sees a man enter the house at 8:50 am. [my emphasis]

Shopping connotes domesticity and therefore femininity [13]; architect and van driver connote masculinity and the default connotation for police *constable* is masculine, this being underlined by the use of the initials PC (police constable) and WPC (*woman* police constable), the “W” being, otherwise, a clear pleonasm [14]. The text, then, sets up a dissonance between its own juxtapositions, on the one hand, and intertextual connotations on the other: a potential site for the worthwhile disruption of patriarchy. However, this dissonance is occasional and never explored. The text is structured as a relentless sequencing of tasks; activity on these tasks is clearly to be maintained if the primary goal — the acquisition of mathematical knowledge and skill — is to be approached; the connotative dissonances [15] are suppressed. The *goal* of the action [Leont’ev [16], 1978; 1979] concerns the elaboration of mathematical techniques; the *means* involves tasks, some of which happen to serve the ancillary function of providing an alibi for sexism.

The suppression of connotative dissonances allows the latter — at most — to emerge, briefly, as jokes which are, of course, counterproductive in terms of antisexism: the following sequence, from the same book, seems ideally suited as an illustration:

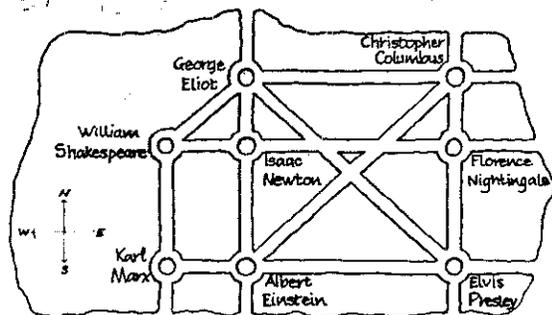
A Viking chief and his three sons raided a castle and made off with 2714 gold pieces. The chief took 893 himself and shared the rest equally between his sons. How many did each son get?

Another chief and his four sons stole some gold pieces. The chief took 267 himself and each son got an equal share of the rest. If each son got 176 pieces, how many pieces were stolen?

Yet another chief and his *daughters* stole 6941 gold pieces. The chief took 2417 and his daughters shared the rest equally. If each daughter got 348 pieces, how many daughters were there? [my emphasis]

An unusual way, perhaps, to count your daughters.

It may be that the suppression of context is so effective as to elide even comedy. On visiting a second-year secondary class working on the booklet stage of *SMP 11-16* I spoke to a girl who was working, on her own, through the activity in Figure 2.



- B5 Find the statue of Isaac Newton on the map
 ▲ You are standing by this statue
- Which statue do you see if you face north?
 - Which will you see if you turn and face east?
 - Which statue will you see if you turn a bit more and face south?
 - If you turn a bit more and face west which statue will you see?

Figure 2

The student was working diligently, answering the questions correctly and without any apparent difficulty. I pointed to the statue of George Eliot [17]

- “Who’s this?”
 “It says it’s George Eliot.”
 “Do you know who George Eliot is?”
 “Is he a scientist?”
 “So who’s that on top of the pedestal?”
 “Florence Nightingale?”
 “She’s moved over to George’s pedestal, has she?”
 “Yes.”

The hiatus had only opened up at all because I had intervened, disrupting the flow of activity. Furthermore, it was easily sutured by the student who readily substituted a dissonance of syntax (the name on the pedestal not being the name of the individual represented) for a dissonance of connotation (a masculine name cannot signify a female [18]). A picture of George Eliot might connote a society in which a woman cannot become publicly successful unless she is believed to be a man: a picture of a *statue* of George Eliot seems to reflect a cosy image of a contemporary culture which is quite prepared to celebrate the lives and products of the good and the great, their femininity notwithstanding. In any event, such intertextual connotations must precede the reading; this clearly did not obtain in the case of the student in question. Deliberate pedagogic action is demanded, but this, of course, would detract from the goal of the action which is mathematics.

Three textual strategies with respect to gender have been considered. The first celebrates the social construction of

the feminine/masculine opposition and re-asserts its correspondence with “user of technology”/“controller of technology” and, therefore, the affinity of the masculine with erudite mathematics in contrast with the alienation of the feminine; the subject is constituted through the reinforcing of the gender code. The second strategy excludes as a positive presence the feminine from mathematics, confirming it in its alienation as a negative trace of otherness. The third strategy [19] makes a ritual genuflection to the discourse of equal opportunities and so defuses antisexist petards. The possibility of actual critique within the text, however, is suppressed through the rigid structuring of what the text is really about and through the failure to confront gender as a social structure; any residual connotative dissonance emerges as a joke or is easily repaired within available discursive resources. The social is already structured by a gender code, but by leaving the hierarchical organization within this code untouched or by actively reinforcing it, these three strategies within school mathematics texts facilitate the articulation of a gender hierarchy to a curricular one, defining the masculine as mathematical and the feminine as anti-mathematical. These constitutions of subjectivity are not contingent upon cognitive styles: they are part of what it means to be male or female. School mathematics texts do not cause girls to fail: they reproduce and augment what it means to be a girl. Whatever their actions, girls must either be confirmed in their femininity and therefore as lacking anything more than moderate “ability” in mathematics [20], or they must be labelled as gender-freaks. Girls and, by the same token, boys are thus doubly bound into a social structure which delimits possibilities; their fetters are not going to fall away simply because teachers and students decide upon something else, even if the latter were possible.

Social class and mathematics texts [21]

Subjectivity is not one-dimensional. Human subjects are divided in many ways both between each other and internally [22]. Whilst gender is a classification relating to the domestic division of labour [Dowling, 1991], social class is associated with the division of labour in commodity production and, in particular, to the intellectual/manual division [23]. Whilst the gendering of mathematics texts is such as to exclude the feminine and invite the masculine, their construction — that is, both the construction of the texts and their construction of the subject — in terms of social class is somewhat more complicated. Firstly, the school mathematics curriculum is explicitly differentiated, not in terms of class, but in terms of “ability” or any of its euphemisms. Now there is a direct intertextual link between “ability” and social class, the genealogy of which can be traced back at least as far as the nineteenth century eugenicists [see MacKenzie, 1981]. However, there is a certain effacement of this in the rhetoric of equal opportunities liberalism which asserts — or, at least, aspires to — the possibility of an “able” working class subject. Tensions between different discursive positions — “working class people are stupid”/“working class people must have an equal opportunity with middle class people to attain middle class jobs” — would perhaps introduce too much ambiguity into the reading of “ability” were there not alternative, perhaps more insidious, connota-

tions linking this “quality” to social class. Given my assumption that social practices constitute rather than express the human subject, it follows that if there exists a structuring of educational destinations by social origins [Halsey et al, 1980] then this structuring must be continually reproduced within educational practice [24]: what is the code that enables us to read “ability” as equivalent in some way to class?

For the third year of secondary schooling [25] the *SMP 11-16* scheme divides into three series of books and associated materials:

The Y series is for the most able group of pupils (roughly speaking, the top 20-25 per cent or so, although the proportion is likely to vary from school to school). The B and R series are for the “middle” group (the next 35-40 per cent of [sic] so) and the G series is for lower ability pupils (apart from those with special learning difficulties) (*Teacher's Guide to Book G1*: 4)

I want to focus on the differentiation — made in the name of “ability” — between the two extremes [26] of “Y”[ellow] and “G”[reen]; in this paper I shall refer mainly to three areas of difference: the binding of the “Y” and “G” books; the relationship between prose and illustrations in the two series; and their differentiation in terms of the intellectual/manual opposition.

The first two areas of differentiation are easily illustrated. The main “Y” series of books [27] comprises five books totalling 832 pages; the “G” series has eight books with 512 pages in all. As a result, each “G” “book” contains only about 60 pages and is stapled together as a booklet whilst each “Y” book contains about 160 pages and is bound as a book. The content of each series is differentiated in terms of quantity of prose and illustrations: considering the introductory chapter of each series, there are approximately twice as many words per page and half as many pictures per page in book Y1 as in book G1. The overwhelming impression on looking at a “G” booklet is that it is intended to be looked at rather than read, and the earlier booklets in the series have a distinct comic-book feel to them, with many of the illustrations being jokes at the expense of academic school work — an example being the geography class in book G1 who, by the end of the lesson, are all reading magazines and comics instead of textbooks. The “Y” books, on the other hand, have a much more intellectual appearance, with wordy pages and discreet illustrations, jokes which do appear are far more cerebral — “Why are you in such a hurry?” “I’m trying to get home before the petrol runs out” [28] — and related more or less directly to the content of the chapters. The “ideal reader” [Eco, 1979] of the “Y” series is clearly constructed as far more mature and intellectual than the “spectator” of the “G” books.

The covers of the two series are startlingly different. The “Y” covers show a contour map which reveals a face, an M.C. Escher print, a girl and her reflexions in two parallel mirrors, a table lamp casting a parabolic shadow on a sheet of graph paper, a map of the world printed on an icosahedral globe. These covers are enigmatic, inviting the reader to participate in academic exploration, they represent the mundane world made intellectually strange. The “G” covers show pictures of a clock and two watches, a technician

weighing a mouse, two surveyors using a tape measure, plan and elevation drawings of a windmill, a plan of the ground floor of a house juxtaposed on a street map, an exploded diagram of a cottage, a cheetah and Disneyland’s monorail and spherical building. The “Y” covers problematize the mundane, the “G” covers celebrate it. For the “G” reader, mathematics is primarily about measuring and technical drawing, there are no enigmas to be explored, merely skills to be exercised, facts to be learned (cheetahs go very fast) and the occasional bizarre object to be ogled [29]. If the “Y” series connotes the intellectual, the “G” booklets signify the manual.

This intellectual/manual division is also apparent in the content of the two series. Manual work is an important aspect of learning for the “G” reader:

We hope that it will be possible to give pupils as wide a range of practical experience as possible. Some (like weighing) we have included in the work. In other places it is very desirable to have practical work alongside, or in place of, the written work. So, for example, alongside book G1 we would hope that watches and clocks could be used in chapter 4, “Time,” and that dials, meters and scales of various types can be brought into the classroom for use in chapter 1, “Estimating and scales.” [*Teachers’ Guide to Book G1*: 9]

The manual aspect of tasks is frequently emphasized by the inclusion of drawings of hands holding rulers, cutting out shapes, squeezing a tube of glue. In the “Y” books, the occasional occurrence of a manual task is mitigated by a refusal to describe it as such. A Y1 activity which involves cutting out and gluing together a cuboctahedron and using it as a kind of dice in a probability investigation contains minimal instructions as to how to assemble to object: “Make a cuboctahedron. *The net for it is on worksheet Y1-4*. Stick the flaps in the order shown”; the icosahedron is shown only as a net and as a polyhedron, there are no intermediate stages, the manual task of constructing it is marginalized as beyond the mathematical. A corresponding G1 activity devotes more than half of the page that it occupies to a cartoon strip showing a pair of hands cutting out a tetrahedron — which is, in contrast to the “cuboctahedron,” never named — folding it up, putting a piece of blutack in it and gluing it together; the manual is celebrated as almost constituting the mathematical.

The differentiation between the “ideal readers” of the “Y” and “G” series constitutes the scaling of “ability” within this particular fragment of mathematics education practice: the ideal reader of the “Y” series is what it means to be of “high ability,” that of the “G” series is what it means to be of “low ability.” But the particular form of the differentiation also connotes another opposition within its general cultural milieu: that of the quality/popular press. “Quality” daily papers, such as *The Times* and the *Daily Telegraph*, are sometimes referred to as the “heavyweights,” whilst *The Sun* and *The Daily Star* “lightweights.” These terms refer to the style of prose and the content of the papers in the two categories, but they are also descriptive of the physical difference between “quality” and “popular” newspapers: on the 21st March 1990 — the day following John Major’s last Budget as Chancellor of the Exchequer — *The Daily Telegraph* contained 48 broadsheet pages and *The Times* 56

(in two sections), *The Sun* and the *Daily Star*, on the other hand, contained only 32 and 36 pages respectively; since the tabloid format of the “populars” is only half the size of the broadsheets, the “quality” papers cover approximately four times the page area of the “populars.” The front pages of the two “quality” papers mentioned each have a single photograph illustrating the budget: *The Times* has the traditional image of the Chancellor holding aloft his dispatch case, whilst *The Daily Telegraph* has a shop display of televisions all showing the first *televised* budget; approximately eighty percent of each front page is devoted to text. *The Sun* and the *Daily Star* devote only about twenty percent of their front pages to standard text, the rest being taken up by enormous headlines, a photo of Gloria Estefan (who had been involved in a motoring accident) and a picture of the Princess Royal and her estranged husband in *The Sun*, or a cartoon drawing of Mr. Major as a piggy-bank in the *Daily Star*. The “picture”:prose ratio is only a little reduced throughout the body of the two “populars,” Jeremy Tunstall [1983] estimates that “[t]ypically about 60% of a tabloid’s contents is in fact “looked at” material — pictures, headlines, cartoons and display advertising” [p. 134].

In terms of the style and content of the articles in the two categories of paper, the “qualities” aspire to objectivity in their analysis of the affairs of society, whilst the “populars” seek out the titillating and exhibit the “outrageous.” The austere and descriptive “Tory Smiles for Major’s First Budget” (*The Times*) and “Major Tries to Draw Sting from Poll Tax and Boost Savings” (*The Daily Telegraph*) contrasts starkly with “Save of the Century” (*The Daily Star*) — an allusion to a popular TV game show, *Sale of the Century* — and “All Alone Anne Gets £14,000 Pay Rise” (*The Sun*). The games played with language in the “populars” — double meanings, alliteration, etc. — are all but absent from the “quality press”; indeed the tortured prose of the *Telegraph* headline is clearly an acceptable sacrifice to information. Even when it comes to the reporting of more obviously “gutter-press” material, the “qualities” maintain a cool and intellectual distance: compare *The Times*’ headline, “Doctor Admits to Affair” with *The Sun*’s version, “Woman Doc Craved Sex with Patient, 24,” and the prominence and content of the respective stories are similarly opposed. Both *The Times* and *The Sun* contain prize games, but, again, the differentiation between their respective affinities with the intellectual is quite apparent in the opposition of the “Tournament of the Mind” and “Spot Ball,” not least because of the latter’s focus on the “manual” (sic) activity of football which is widely celebrated in the “popular” press. This “intellectual”/“manual” opposition is also apparent in advertising within the two sectors: “SALES MANAGER Algarve, Portugal £45 — 70K + Benefits” in *The Daily Telegraph*, compared with “HANDS UP FOR A JOB . . . REAL TRAINING • REAL SKILLS • REAL JOBS” in *The Sun*. The direction of textual strategies with respect to the “intellectual” is *centripetal* in both the “quality” press and in the SMP 11’16 “Y” series and *centrifugal* in the “populars” and in the “G” booklets; these directions are reversed with respect to a “manual” focus.

The social class connotations of the two sectors of the press is born out by their respective readership: approxi-

mately eighty percent of the readerships of *The Times* and *The Daily Telegraph* are classified in social classes AB (higher or intermediate administrative, managerial or professional) or C1 (supervisory, clerical or junior administrative, managerial or professional), whilst only about twenty percent of the readers of *The Sun* and the *Daily Star* fall into these categories [from Tunstall, op cit]. In fact these distinct circulation groups are explicitly targeted by advertising within the two sectors [ibid]. The SMP 11-16 “Y” and “G” series, by connoting — through their format, presentation and content — the “quality” and “popular” press are associated with distinct social classes, and this is compounded by the opposite directions of their textual strategies with respect to “intellectual” and “manual” activity. The textbooks thus effectively define or construct equivalences between “high ability” and “high social class” and between “low ability” and “low social class.” As with the gendering of mathematics, described above, these are not roles that subjects can choose to play or not to play, they define what it means to be high or low “ability” and this has to do with *social* and not *cognitive* “qualities.”

Conclusion

“When I use a word,” Humpty Dumpty said in a rather scornful tone, “it means just what I choose it to mean — neither more nor less.” (*Lewis Carroll*)

The personal control over language that is claimed by Carroll’s albuminous character is precisely the object of my critique in this paper. To pretend to the delimiting of meaning is to treat language as if it were a nomenclature. But we cannot shut out the intertextual connotations that enable us to read a text which thereby defines and constructs us in relation to it. My intention has been to introduce the beginnings of a sociological exploration of mathematics education through a consideration of the ways in which school texts can be understood as constituting the “learner” as a gendered subject with a specific “ability,” the latter being an attribute of *his* [30] social class. There are a great many issues which have been left unaddressed, not least, the question of whether any change in the situation is possible. In a sentence, my position is that we should consider the social, not as a mechanism in which all of the components operate in harmony, but as a balkanised domain in which tensions and contradictions are endemic; because they inhabit numerous contexts within this domain, human subjects are also fragmented — they are teachers, they are parents, they are black, they are members of a political party — this fragmentation allows for the restructuring of social contexts through the recontextualization of practices [31]: what phenomenological approaches often understand as voluntarism might be replaced by a will to unity of the essentially fragmented subject; a will that is also a cultural product and which cannot be satisfied because each unifying action is also the restatement of difference; the play of *difference* has no roles and no auditions, it is a Calvinism without a God. After his fall, all the king’s horses and all the king’s men can never put Humpty together again. As shattered subjects of a shattered society, we can always effect change in one way or

another, but, as Michel Foucault has put it:

People know what they do; they frequently know why they do what they do; but what they don't know is what what they do does [personal communication quoted in Dreyfus & Rabinow, 1982]

Acknowledgements

I would like to thank Parin Bahl, Basil Bernstein, Andrew Brown, Richard Noss and David Pimm for valuable discussion and critical comment on the methodological and substantive issues associated with this paper; I would also like to thank Cambridge University Press for permission to reproduce the page from the *SMP 11-16* booklet 'Turning' and the various quotations from *SMP* and *SMP 11-16* materials

Notes

- [1] I am using 'subject' throughout this paper to refer to *human* subject, i.e. not curriculum subject
- [2] See Foucault [1965, 1970, 1972, 1973, 1977, 1978, 1980, 1981, 1982, 1984, 1986], also Laclau [1984] and Laclau & Mouffe [1985]. Work within the field of (mathematics) education and which incorporates what might be described as a broadly Foucauldian methodology also problematizes this dualism, see, for example, Corran & Walkerdine [1981], Walkerdine [1984, 1988] and my own work as cited
- [3] This is also the case in some, but not all, other work employing this term.
- [4] McBride states that she does not intend a simple relationship between gender (feminine/masculine) and sex (female/male), but this is belied by the frequent slippages in her language.
- [5] Howson, A.G. & Coup, H.M. (eds) [1965] London: CUP
- [6] I am using the term "code" in a way similar to (but within a different context from) Barthes [1974], that is as a general context of interpretation, as the cultural "data base" of intertextual connotations.
- [7] It is important to note that, in this form of analysis, I am not claiming to produce the definitive reading of the text, but simply to demonstrate the workings of the text internally and intertextually. It is clearly possible to interpret 'helping' as signifying a subordinate role, that is as tending to invert the patriarchal hierarchy between women and men: faith in such an interpretation may however require somewhat olympian feats of the imagination
- [8] It is interesting that 'housework' does *not* connote DIY, despite the fact that there would appear to be a logical correspondence between, for example, the opposition of 'DIY' to "paying a plumber to repair the central heating" on the one hand, and that of 'housework' and "employing a char," on the other; each opposes doing-it-yourself to getting-someone-else-to-do-it. Of course, plumbers and chars are also gendered: a firm distinction must be made between 'logical' and cultural principles of classification; the former constituting a sub-category of the latter
- [9] Subordination/control is not an essential feature of the technology but must generally be understood contextually: my relationship to my wordprocessor is not the same as that between an office clerk and her's [sic] [see Dowling, 1991]
- [10] Roland Barthes purports to escape from this apparent determinism through the notion of "re-reading" which "... alone saves the text from repetition (those who fail to re-read are obliged to read the same story everywhere)" [Barthes, 1974: 16]: in this sense this paper is a re-reading of school texts
- [11] Valerie Walkerdine [1989 and Walden & Walkerdine, 1985] has made a related argument with respect to the construction of masculinity and femininity in relation to pedagogic practice in primary schools whereby girls' successes in mathematics must be taken as evidence of hard "work" which stands in contrast to the mathematical "ability" which is signified by boys' successes. "Work," Walkerdine argues, is negatively constructed within "progressive" primary practice which emphasizes free play. It has to be questioned to what extent pedagogic practice in primary schools is actually characterized by progressivism [see Brown, 1985, 1990]. See, also, Brown [in press] in relation to the construction of the parental subject in "teacher discourse"
- [12] Despite the status of mathematics as the *queen* of sciences!
- [13] And as is so common when token males are placed in feminine

positions Thomas gets it wrong: he can't even count his change before he leaves the shop

- [14] A similar comment should be made about locutions (prevalent in UK English) such as *woman* athlete, *woman* doctor and *lady* golfer, and about feminizations such as actress and authoress: in each case, the unfeminized form clearly connotes the masculine. I understand that the use of "W" to denote a female police officer is now obsolescent, but this has clearly not yet reached the ears of British TV producers who continue to use it in their dramas
- [15] And, indeed, the "everyday" and other contexts of the tasks; see Brown & Dowling [1989]
- [16] Leont'ev proposes a hierarchy in which, within any 'activity' (say school maths with respect to the student), 'actions' — which are related to "goals" — are more fundamental than "operations," the latter concerning "means" and so being, in a general sense, arbitrary
- [17] The dialogue which follows was recorded as field notes but has been rendered here as direct speech
- [18] On another occasion, another student resolved the dissonance by suggesting that George Eliot might have been a priest
- [19] The *SMP 11-16* texts which have been used to illustrate this third strategy are not exorcised of the first mechanism: see, for example page 30 of book G6 on which "Ruth wants to make a curtain": clearly there are limits to what males can be seen doing
- [20] See also Walden & Walkerdine [1985] and Walkerdine [1989] for an empirically alternative route to similar conclusions.
- [21] See Dowling [in press] for a fuller treatment of this topic
- [22] See Dowling [1989, 1990b, 1991]
- [23] I do not intend a simplistic marxist division between capital and labour, but one which reflects the actual, that is, culturally defined conditions of labour: closer to Gramsci [1971] than to *The Communist Manifesto* [Marx & Engels, 1967edn]!
- [24] This is an expression of the dialectical relation between structure and event or, in Saussure's terms [1983edn] *langue* and *parole*, which Jacques Derrida [1981] encapsulates in the *a* of the motif *différance*
- [25] That is, students of ages thirteen to fourteen
- [26] Since SMP have produced no materials explicitly for "those with special learning difficulties" I am referring to the extremes within their provision
- [27] For simplicity, I am considering the central core of textbooks in the "Y" and "G" series and not extension books and other associated materials
- [28] Book Y1. Of course the question is asked by a male penny-farthing cyclist and answered by a female driver
- [29] Book G1 has a thoroughly offensive item inviting students to compare the heights of photographed people described as "giants" and "dwarves"
- [30] The use of the masculine is appropriate insofar as the feminine is alienated from mathematics. The possible interrelationship between gender and class has not been considered in this paper
- [31] See Dowling [1989, 1990b]

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Small children have many more perceptions than they have terms to translate them; their vision is at any moment much richer; their apprehension even constantly stronger than their prompt; their at all producible vocabulary

Henry James
