Psychologising Educational Difference

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In this paper I will seek to argue that teachers have been constituted through practices and discourses of teacher education programs so as to perceive and construct their world through psychologistic frameworks. Part of becoming a legitimate practitioner within mathematics education[1] is the embodiment of these discourses as recognised through the credentialling processes of teacher education programs. In such programs there is a focus on pedagogical processes whereby the learning of mathematics is seen as the internalising of knowledge and concepts. These programs are dominant within the broad field of education, so that many, if not all, of the teachers emerging from teacher education institutions enter the school context holding sets of beliefs and attitudes about the nature of teaching and learning which support liberal views of schooling. As such, there is a strong propensity for teachers to explain their students' successes and failures in mathematics education within psychological terms of references where references are made to concepts such as ability or intelligence; levels of development or cognition; motivation; self esteem; and (positive) reinforcement. The focus is on a individualised subject devoid of the social and political context within which meaning making is occurring. By undertaking a critique of these discourses it is possible to understand the subtle ways in such discourses provide the framework/s through which teachers translate student behaviours as well as in the organisation of learning environments (Walkerdine, 1988). Such a framework does not take into consideration the wider context in which the students are located, and the political consequences of such interpretations, particularly in relation to the construction of social and gendered differences.

The exposure of students, both primary and tertiary, to psychological discourses and the practices imbued with such discourses constructs them in particularised frames of references. For example, positioning students within the discourses of ability and the accompanying practices of testing and quantitative assessment where marks or scores serve to indicate some measure of ability, students and teachers come to construct learners as being more or less able than their peers. This notion of ability becomes defined and reified through psychologistic discourses so that it becomes taken-for-granted and serves as a truth within education whereby students become constructed and rewarded within these frameworks. Ability is something which is seen to be inherent in the individual. By taking ability as an individual attribute, social, cultural and gendered issues are largely ignored since ability becomes an objectivised construct which is intrinsic to the individual and has little to do with the construction of social, cultural or gendered positions within the wider social framework. In this paper I will seek to argue that teachers construct their students' behaviour within psychological terms of references, and that this process has important implications for teaching particularly when social justice issues are taken into consideration in the processes of meaning making in

[1] I make explicit reference to mathematics education in the context of this paper, but the issue should be more broadly conceived as relating to the general field of education.

mathematics.

The Ethnographic Study

The study was a critical ethnography aimed at deconstructing the discourses and practices within mathematics education that could be seen to be contributing to the construction of social differences within the field. Three schools, from a major regional city in Victoria, participated in the study of which two were government, and the third was an independent school. The schools were selected on the basis of their representativeness of the broad social structures within Australian society. The two government schools were situated within divergent socioeconomic regions, so that one represented a working-class culture, and the other a middle-class culture. The third school was an elite Independent school commanding high fees and as such could be seen to be representative of a upper-middle to upper- class clientele. Data was collected using participant-observer methods of ethnography and supplemented with teachers and students interviews. Two grade levels were involved in the study Grade 1, the second year of formal schooling (6-7 year olds), and Grade 5, the second last year of primary school. All schools were mixed gender schools.

From field notes and interview transcripts it was clear that while the teachers were practising in three very divergent contexts and represented a diverse age, social, cultural, gendered and religious cross-section, their beliefs about the nature of teaching and learning were framed within the same terms of reference. Their practices were heavily imbued with behaviourist notions of learning and teaching while three main discourses dominated their theoretical expositions of teaching and learning: ability or intelligence; Piagetian psychology with a particular emphasis on cognitive development; and Humanism. Other discourses, such as motivation, personality, metacognition, were mentioned, but these did not feature strongly in the responses that were made. Discourses of economic rationalism, competencies or sociology did not appear in the discussions.

Discourses in Mathematics Education

A quick survey of the major research conducted within the field of mathematics education whether through publications, research grants, or conference proceedings indicates that psychology is a dominant framework which structures and determines legitimate knowledge within the field. As Bourdieu (1992) has persuasively argued, fields are governed by a logic which determines what is seen to be legitimate structuring knowledge within that field. Within (mathematics) education, this governing logic is provided through psychology. This resonates with the comments, and concerns, of one of Australia's leading mathematics educators, Prof Ken Clements (1991, 1993) concerning the direction of research in mathematics education.

From the interviews with the teachers, it would appear that to be constructed as good learner of mathematics, it is imperative that students have "ability" which invariably was seen as something innate within the individual student. It is an almost fixed capacity which will alter, and perhaps increase, with maturity. Maturity should be understood to include experience since invariably as the individual ages, s/he will be exposed to experiences so that it

is impossible to delineate biological maturation from the experiential domain. This position is very much in line with Piaget's genetic epistemology. Teachers' responses ratified this framework whereby they saw learning mathematics intrinsically related to an innate capacity of the individual. This can be seen in the following comment:

> Clarice: Students need to have an ability in logic [to learn mathematics], being able to think clearly and of course there's not a lot of people who can do that very well. It's really something that comes with maturity.

Similar comments were offered by other teachers which indicate the influence of these discourses on their interpretation of their students behaviours in mathematics. It can be seen in these comments that the teachers have constructed their students within frameworks whereby ability is seen as something innate but integral to the learning of mathematics. Those students who have good "brains" or are favourably "endowed" will be able to learn mathematics more readily than their peers who are not so genetically fortunate.

> Mike Some kids' brains are a bit more focussed than others, and some kids' aren't.
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> Ken She only arrived at the school, and obviously she doesn't have a lot of ability in maths...I don't think she's overly endowed, but she's not dumb either.

By implication, this suggests that students will be naturally good or poor at mathematics and that the capacity to do well in mathematics is intrinsically linked to something which is genetic. That is not to say that teachers were not aware of the role that the students' familial background plays in the schooling process. As can be seen in the following comments, the teachers have been influenced by the notions that ability is something innate, almost fixed and to some degree inherited, but is also influenced by parental attitudes towards schooling.

> Jack: I would say it's [the failure of working-class kids at mathematics] possibly a parental attitude. I don;t know. That's probably part of it, the parent's attitude towards school in general would be related to it. It would be interesting to look at the parents and see how far they went at school and what sort of abilities they had in maths and then you could relate that to what happens at school.
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> Helen: All the tests we've given him show that all his knowledge is learned knowledge, it's not instinctive, it's not natural. He is an only child, his parents teach him at home every night so what he knows has been learned from home. So if we give him some unseen or unknown work that he's never had before, he can't do it. So we're in a really sticky position because he got a distinction in University of New South Wales maths competition which we have our children sit every year. But we're really resisting [against accelerating him] for social reasons, but his parents are really pushing to accelerate him.

Jack's comments indicate that the home environment for working-class students may be influential in passing on certain attitudes about the nature and value of formal schooling, while Helen acknowledges that her student's parents are able to provide an environment that can accelerate progress through school. However, within both comments there is a recognition of limits to the degree with which the family background can influence learning. Both teachers are constrained by the belief that ability is something that genetically constrains or facilitates learning. For Jack this is borne out in his comment concerning the mathematical abilities of the

parents and how this could be related to the (lack of) success in the students. Helen argues for a similar position when she comments that the student's knowledge was all learnt, "it's not instinctive, it's not natural" suggesting that while the environment can influence learning, it is constrained by the innate capacity of the individual.

Liberal views of schooling were dominant within the context of this research project and inextricably bound to the framework offered when psychogologising education, learning and schooling. Believing that students do have different abilities, the role of school is to facilitate an environment whereby students are given space to develop their individual potential. By positioning educational success and failure within a psychologistic framework, students are seen to be the root of learning and teaching so that the role of teachers is one where they are largely responsible for the educational outcome of students as can be seen in the following comment:

> Kerryn: [one of the main reasons for coming to school] is to build up their self esteem so that they're able to cope with their ability... I try to give children as many different life strategies as possible that they can draw on, and so with education I see giving them development and understanding, and mainly so that they can develop their own abilities too. And that they are aware of their abilities.

These comments indicate that Kerryn positions her theories of learning within rather deterministic notions of some fixed abilities in mathematics, and that her role as an educator is one which can be seen to be adaptive in that students should be aware of their limitations and learn strategies to help them cope with these genetic limitations.

Moving away from the more deterministic notions of inherited abilities or cognitive development, another major explanation of mathematical learning offered by teachers was informed by Humanistic discourses. These responses reflect the assumption inherent in Humanistic psychology that if, somehow, students morale, confidence or sense-of-self could be improved, they could be seen as successful learners of mathematics.

> Clarice: An unhappy child won't learn or can't learn, so that we can at lest help them to be happy, then the learning will eventually take place.
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> Helen: Her lack of confidence is almost blocking her from gaining an understanding, and reasoning, logic and lateral thinking are all fairly delayed.
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> Ken: They've got to have their confidence built up as much as you can. I think most kids can succeed in maths, if they are given that time, you know, just given the success.

These discourses suggest that the students are seen as the source of the problem in learning mathematics, where it is their levels of confidence, happiness or sense-of-self that is hindering their learning of mathematics. Accordingly, for students to become successful at learning mathematics change will be directed at the level of the individual. The teacher's role in redressing the problem is focussed at improving confidence, self esteem or other attributes of the individual as can be seen in the comment:

> Ken Jane's typical, if she doesn't have success, it's only going to keep reinforcing failure and in the end you get nowhere. So you've got to start at a level and make sure she does have success and that she can see that maths is something that she can do.

From the responses offered by teachers it was apparent that the teaching and learning of mathematics was founded in psychological discourses so that success and failure were explicated as something inherently individualised. This could reside with either the student in relation to the meaning making process, or with the teacher and the teaching process.

Psychology and the Teaching Habitus

Little explicit reference was made to the discourses although it was clear that teachers based their work within these frames of reference since there was a strong propensity for them to label students in ways which were heavily imbued with psychologistic signifies and concepts so that success and failure within mathematics was seen as something internal or a function of the individual in some way or another. The psychological discourses that have constituted teachers through teacher education programs have provided the frames of reference for teachers to understand, and hence organise, the experiences of their students. This embodiment of psychological discourses forms a habitus (Bourdieu, 1982) which provides a lens through which teaches come to perceive teaching and their students since the behaviours, actions and thoughts of students and teachers become interpreted through this habitus. The dominance of psychology within the teaching profession makes it very difficult for teachers and teacher educators to see beyond this frame so that the framing discourses are rendered invisible making the interpretive frameworks invisible so as to become taken-for-granted. The discourses become policing discourses since they guide, construct and constrain the ways in which teaching and learning are interpreted and organised by those working in the field. Psychology becomes embodied through teacher education programs to become part of the teaching habitus. In turn, this provides the filter, or lens, through which teachers interpret, translate and organise classroom practice and behaviour.

Psychology, with its focus on the individual, provides the filter through which change will also be mediated. For students who are not able to be successful in the study of mathematics, changes will be made that are centred around the individual. This could be in the pedagogies employed by teachers or in attempts to redress social and cultural deficits that the students is perceived to bring to the schooling situation, but where the immanent focus on the individual. This focus on the individual fails to address the wider social, cultural, historical and political context within which the processes of schooling and learning are situated. The non-random failure of working-class students, women, or students from non-Anglo backgrounds is interpreted within this framework and seen to be related to some deficit or difference within the individual rather than as a structural or discursive construction.

Psychology as a Regime of Truth

Valerie Walkerdine (1984, 1988) and Jennifer Gore (1993) have effectively appropriated Michel Foucault's "regime of truth" to denote the notion that certain constructs such as rationality, gender, child development and pedagogy can operate so that they become accepted as truths within a society although they are historically and socially constructed and as such, are not reflections of an ontological realities as commonly perceived within a society. Such

socially constructed phenomena are legitimated through scientific discourses so that they come to be seen as facts rather than as Walkerdine and Gore argue "fictions operating as facts." By accepting that psychological traits such as ability, levels of development and self esteem are truths which have a major impact upon the learning of mathematics, the construction of social differences is seen to be something which is due to individual characteristics rather than wider social factors. Students who come from non-Anglo-Australian-middle-class backgrounds are more likely to experience lack of success in the study of mathematics than their peers who come from white, middle-class backgrounds. Similarly, for gender, there is more chance that males will be more successful than females in the study of mathematics. The lack of success for these groups of students is predominantly framed within psychological traits, such as ability/intelligence, self-esteem, levels of cognitive development, motivation, attribution theory where the blame is with the individual rather than social or structural causes. By focussing on the individual, the political functions of formal schooling, of which mathematics plays an important role, are rendered invisible and hence ignored. Students are seen to fail mathematics because of something inherent in the individual, thereby legitimating their consequential marginalisation within the wider society, and in the process further supporting the existing social status quo.

Students from working class backgrounds and/or non- Anglo backgrounds along with women are less likely to be constructed as successful learners of mathematics. Within psychological discourses, this lack of success is seen to reside with the individual (either in the learning or teaching process) whereby they are seen to be lacking in some way which contributes to the lack of success. Consequently, in order that students may be able to learn mathematics more effectively, changes are directed at this level. In this process, the success of white-middle-class males is determined to be something inherent in the individual where, for example, they are seen to have ability in the subject or hold the "right" attitudes and values towards schooling and mathematics. This is reified in research which indicates that men are able to perform better than women on mathematics exams (Arndt, 1994), that males are able to perform certain spatial tasks better than females (Wattanawaha & Clements, 1982), hemispherical specialisation of the brain biologically predisposes men to be better than women at logic-spatial thinking whereas women are seen to be better at language-oriented tasks than men (Buffery & Gray, 1972), self-esteem influences on educational outcomes (Leder, 1980), or the research focusing on levels of mathematical development which defines hierarchies of cognition. Much of the research conducted within psychological frames of references lends support to the marginalisation of many social, cultural and gendered groups since the individual is seen to be the source of the problem. For example, the reification of levels of thinking, such as the SOLO taxonomy or van Hiele levels of geometric thought, suggest that students pass through a series of natural stages as they progress towards rational thought. By implication, this suggests that those students who do not attain higher levels of thought are somehow "lacking" or "deficient" or some other similar descriptor that implies that it the student who is at fault. Practices such as these fail to take adequate account of the social and cultural context within which learning and meaning making occurs. This can be seen most poignantly in Piagetian cross-cultural studies. For example, Seagrim and Lendon ( ) argued that Central

Australian Aboriginal students were cognitively immature since they could not do the tasks as well as Anglo-Australian students. In many ways, this focus helps to justify and legitimate the marginal status of many social and cultural groups since it is the fault of the individual that they are not successful within the school context.

The passing of Year Twelve examinations and the subsequent status and power that is conferred with entrance into tertiary institutions which offer high status courses such as medicine, veterinary science, dentistry or law is seen to be a function of individual ability and/or hard work so that those students who are able to gain entrance to such courses and enjoy the rewards offered by such professions are seen to be just and deserved. Psychological discourses help to perpetuate the myths that the distribution of power and status is fair and deserved since those students who were able to gain entrance to such courses did so fairly. The fact that it is generally white, middle-class students who gain entrance to such courses is seen to be based on merit and this is effectively legitimated through psychological discourses.

Critical Sociology and Educational Difference

For students who come from different social and cultural backgrounds from than those represented within the cultural systems recognised within the formal school context, their highly probable lack of success within the schooling system is seen to be something inherent lacking, or deficient within the individual rather than endemic to the schooling and social system. From the 1960s there has been an increasing awareness that the distribution of educational success corresponds closely to the social distribution within the wider society. Bowles and Gintis' (1976) correspondence theory argued that schools play an integral role in preparing students for life in an unequal society. The role of mathematics in this process is becoming increasingly under scrutiny for its role in producing and reproducing social inequality (Anyon, 19881; Atweh & Cooper, 1991; Webber, 1988) and particularly gender inequalities (Burton, 1990; Leder, 1992; Willis, 1989). Sue Willis argues that the focus on the individual accepts, "almost without challenge, the status quo in terms of the mathematics curriculum and the institutional structures through which mathematics is used as a sieve" (1990, p. 199). The exposure of students to school mathematics is more than an individualised meaning-making process. For students to be constructed a effective learners of mathematics requires the students to know, and display, the cultural system that is valued within the context of schools. Students who are familiar with the patterns of language, work and power that are constitutive of schooling will be more likely to be constructed as effective learners since they can use and display the linguistic registers that are recognised and valued within the context of schools; they are able to work effectively within the patterns valued within the school as well as display the appropriate work ethic that is valorised within formalised schooling; and they are familiar with the distribution of power within this context so that they know their place and role within social interactions. These contribute to the successful construction of learners and are integral to the cultural systems that are brought to the school by the students, but of which only a few are seen to be legitimate within the schooling system. For students whose cultural system is not that which is recognised within the formal schooling

context, their chances of being constructed as effective learners of mathematics is less likely than fro a student whose cultural system is that which is recognised in this context. Psychology does address this bias and as such engenders a victim-blaming approach to the study and success in mathematics.

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