Running head: Who is not multilingual now?

Title: Who is not multilingual now?

Author: Candia Morgan

Affiliation: Institute of Education, University of London

Full address for correspondence:

Dr Candia Morgan

School of Mathematics, Science and Technology

Institute of Education, University of London

20 Bedford Way

London

WC1H 0AL

United Kingdom

WHO IS NOT MULTILINGUAL NOW?

What is the relationship between research into multilingualism and research concerned more generally with language and communication in mathematics education? Diversity in linguistic practices is universal in modern society and poses problems for teaching and learning even in apparently monolingual contexts. Research in multilingualism and mathematics education offers constructs and insights that can inform research and pedagogy more widely.

The analysis of cognitive issues associated with bilingualism in mathematics education and the problem of addressing the lack of a mathematics register in the indigenous languages of post-colonial countries have a long history (see, for example, Austin and Howson, 1979; Halliday, 1974) and continue to be relevant for education in many countries. More recently, increased inter- and intra-national mobility has made multilingualism more visible in communities that previously considered themselves to be monocultural. The relevance of research related to mathematics education for multilingual students has thus become more widely recognised. However, for me, a striking feature of the collection of articles in this Special Issue is the extent to which the language practices described and the issues raised have wider implications for our thinking about students' and teachers' uses of language in any setting, including those conventionally considered monolingual.

Clearly there are some specific linguistic features that may affect learning of mathematics in particular languages. This is suggested by Evans' analysis of differential performance on parallel test items in English and in Welsh. Equally, there seem likely to be problems for teaching and learning where learners are not fluent in the language of instruction or where there are mismatches between the vocabularies or structures of the home language and of the language of instruction, as Kazima shows in her discussion of the language of probability in Chichewa and in English. How do such studies, located in specific linguistic and geographical contexts, apply and have interest beyond their local boundaries?

I would argue that much of the discussion of how multilingual students make use of the linguistic and cultural resources available to them, of the choices they make and of the problems they face in the mathematics classroom is relevant to those students who, though apparently monolingual, find the official discourse of the mathematics classroom very different from the modes of being and speaking with which they are familiar in life outside school. In one sense we could say that in modern societies all of us are multilingual to some extent, participating in multiple discourses associated with the different practices we encounter in different parts of our life: within the family and with friends, at school and at work, engaging with the mass media and in a variety of formal and informal social settings. We switch between different ways of speaking (using different vocabularies, grammatical

constructions, intonations, gestures, etc.) in ways that are not necessarily within our conscious control, or even awareness, and in ways that are related not only to the nature of the topic but also to the social functions of our language use and our knowledge of our interlocutors. But we also have different levels of fluency within these various discourses. For example, while I can recognise and mostly understand the language used by my institution's computer technicians, I find it hard to speak.

The differences between everyday practices among different cultural groups and the effects these may have on mathematical practices in school are highlighted when we have the opportunity to examine groups that are clearly separated from the mainstream or dominant national cultures for geographical or social reasons, such as the indigenous Brazilian people of Mendes' study or the Roma people discussed by Stathopoulou and Kalabasis. In both these cases, we see predominantly oral traditions coming into contact with the dominance of literate practices in the school. The outcomes can be seen to vary enormously depending on the power relationships established in the context of this contact. While the Roma children in Greece (and many other European countries) suffer disadvantage and discrimination as symbolic written mathematics is imposed and their oral numeracy practices are devalued, the pedagogy of the teacher development described by Mendes appears to allow and (at least temporarily) legitimate the

emergence of new forms of mathematical literacy practices, incorporating and adapting traditional linguistic forms and means of representation.

However, it is not only those whose home language is not the official national language who suffer linguistic disadvantage and discrimination. The distance between the oracy and literacy practices experienced at home and in school varies for different social groups who may not be overtly distinguished by language or dialect. Whether such differences are characterised as differences between restricted and elaborated codes (Bernstein, 2000) or as different amounts of linguistic capital (Bourdieu, 1991), learners from non-dominant social groups are likely to have less access to the ways of meaning that are valued and useful for progress in school mathematics (and in school more generally). Participating effectively in school mathematics involves not only knowing mathematical facts, skills and technical language but also knowing how to engage in the legitimate forms of discourse of the school and of school mathematics. This is an issue not only for the students involved but also for the teachers who need to take account of a range of linguistic backgrounds in their classrooms.

It is this issue that I feel the collection of papers in this Special Issue does not address fully: how may pedagogy address multilingualism in the classroom? The evidence and discussion of the roles language switching and code switching may play in learning and doing mathematics (Clarkson; Moschkovich) point to a

pedagogy that allows learners to make choices about which of their languages to use, while Kazima's evidence of problems with specialist vocabulary underlines the dangers of imposing a dominant or colonial language as the language of instruction. Does this mean that the language of instruction should always be the language of the home? Apart from the logistic problems such a recommendation might pose for multilingual classrooms such as those studied by Setati and Adler (2000) in South Africa or those in London, where dozens of languages may be spoken within a single school, it also runs a risk of perpetuating disadvantage by failing to provide learners with either socio-economic or epistemological access (Setati, 2005) to more powerful discourses.

Consider a monolingual classroom in a working class area in outer London. Here you hear from the teacher "There are real problems with literacy in this school and this holds them back in maths" but "You have to use their language or they won't engage with the work". In my work in schools with pre- and in-service teachers I hear such a relationship between literacy, mathematical achievement, language use and engagement taken for granted as a common part of teacher discourse. In the classroom, this teacher uses everyday language and, although she introduces mathematical 'key words' in accordance with national policy, she is reluctant to use these exclusively or to insist that her students do so. Her focus is on providing epistemological access to the mathematical ideas through using the students' home

language. I would argue, however, that both language and mathematics learning may suffer from such an approach. Whatever their pre-existing language knowledge and skills, the students are not being provided with access to higher status forms of language in general and, by withholding specialist forms of mathematical language, they are also likely to be denied access to more advanced forms of mathematics.

A demonstration of how discrimination and disadvantage operates may be seen in Atweh et al.'s discourse analysis of mathematics lessons in two schools with populations strongly distinguished by both gender and class[i] (Atweh, Bleicher, and Cooper, 1998). The use of language by the two teachers is markedly different. Interaction of teacher with boys from high socio-economic groups was characterised by use of the specialised mathematical register, introducing students to the use of formal terms and definitions. That between teacher and lower class girls avoided specialised language, using everyday terms and focusing on algorithmic rather than conceptual understanding. Similar findings are reported by O'Halloran (2004), paralleling Dowling's (1998) analysis of the discourse of mathematics textbooks intended for students of different levels of attainment, apprenticing high attaining students to the highly valued discourse while constructing lower attaining students as non-academic, future manual workers. Simplification or avoidance of specialised language may be seen as a positive

strategy to enable learners to access mathematical ideas but, without it, they are denied access to the forms of mathematical knowledge that are most highly valued.

I would propose that considering all classrooms as multilingual allows us to use the notion of code switching as a tool for thinking about student engagement with specialised discourses and about forms of pedagogy that can provide access both to mathematical ideas and to powerful ways of thinking and speaking. Using students' home or everyday language seems likely to provide some benefits for mathematics teaching and learning but, without use of the specialised language and the forms of discourse that can provide access to more advanced study of mathematics and to socio-economic success, it will perpetuate the disadvantage and exclusion experienced by marginalised groups. The important question is: how to coordinate the everyday and the specialised in order to facilitate learning for all?

Note

[i] The authors do not mention any ethnic or linguistic diversity within the two classes. Given their interest in socio-cultural factors it seems likely that we may assume a high degree of fluency in English among the students in both classes.

References

Atweh, B., Bleicher, R. E., and Cooper, T. J.: 1998, 'The construction of the social context of mathematics classrooms: A sociolinguistic analysis'. *Journal for Research in Mathematics Education 29*(1), 63-82.

Austin, J. L., and Howson, A. G.: 1979, 'Language and Mathematical Education'. *Educational Studies in Mathematics 10*, 161-197.

Bernstein, B.: 2000, *Pedagogy, Symbolic Control and Identity: Theory, Research and Critique* (revised ed.), Rowman and Littlefield, Lanham.

Bourdieu, P.: 1991, *Language and Symbolic Power*, Polity Press, Cambridge, MA.

Dowling, P.: 1998, *The Sociology of Mathematics Education: Mathematical Myths/ Pedagogic Texts*, Falmer, London.

Halliday, M. A. K.: 1974, 'Some aspects of sociolinguistics', in *Interactions between linguistics and mathematical education symposium*, UNESCO, Paris.

O'Halloran, K. L.: 2004, 'Discourses in secondary school mathematics classrooms according to social class and gender', in J. A. Foley (Ed.), *Language, Education and Discourse: Functional Approaches*, Continuum, London, pp. 191-225.

Setati, M.: 2005, 'Power and access in multilingual mathematics classrooms', in M. Goos, C. Kanes and R. Brown (Eds.), *Proceedings of the Fourth*

International Mathematics Education and Society Conference, Centre for Learning Research, Griffith University, Brisbane, pp. 7-18.

Setati, M., and Adler, J.: 2000, 'Between languages and discourses: Language practices in primary multilingual mathematics classrooms in South Africa'. *Educational Studies in Mathematics 43*(3), 243-269.