BILINGUAL IDENTITY AND EMPOWERMENT IN SCHOOL MATHEMATICS

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1. Introduction[2]

For most students in the UK, schooling is conducted in English[3]. This situation means that many students from minority language backgrounds must study mathematics in a language they are still in the process of acquiring. Although concern has been expressed that such students under-achieve in mathematics (e.g. Collier, 1987; Gilborne & Gipps, 1996), there has been little research into the interaction between the learning of English (or any other language) and the learning of mathematics.

In this paper I draw on Cummins' (2000) notion of *empowerment* to consider how bilingual students may be supported in their work in classroom mathematics. In particular I will focus on the role of *identity* in the empowerment of bilingual students. My treatment of identity is based on ideas from conversation analysis (e.g. Sacks, 1992) and discursive psychology (Antaki & Widdicombe, 1998; Edwards, 1997). I will use these ideas to analyse a short extract from a transcript of two bilingual students working on a classroom mathematics task together. My analysis shows how the participants use identity categories to link their task to their own experience of the wider world, so contributing to their empowerment. I begin by outlining relevant aspects of Cummins' ideas.

2. Empowerment

In his more recent work, Cummins (see 1994, 2000) has sought to develop a model which incorporates broader social factors into what had previously been mainly psychological descriptions of the relationship between bilingualism, teaching, learning

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[3] In parts of Wales, Welsh is the language of schooling. Some schools in Scotland use Gallic.

and attainment (e.g. Cummins & Swain, 1986). The model relates societal factors with the day-by-day exchanges that constitute teaching and learning in the classroom. It is worth emphasising at this point that Cummins (2000) regards his model as theoretical, a means of thinking about key issues in bilingual education, rather than as some absolute description of reality. Cummins' model contrasts what he calls *coercive* and *collaborative* forms of interaction (2000: 43-44). *Coercive* interaction is characterised by the imposition of one particular perspective on others. This imposition could be in relation to language, culture or what counts as knowledge or mathematics. *Collaborative* interaction gives all participants the power to draw on their own experiences and perspectives, a process Cummins calls *empowerment* (2000: 44). In collaborative interaction, rather than some voices and their languages, cultures and ways of knowing prevailing over others, the voices of all are listened to and respected.

Using these contrasting forms of interaction, Cummins proposes a model relating macro-level social factors with micro-level classroom interactions. I will focus particularly on the part of the model that concerns classroom interaction, at the heart of which lies the notion of identity. For Cummins (1994: 47), all interaction between students and teachers can be seen as 'a process of negotiating identities', a process which forms an inseparable part of teaching and learning (Cummins *et al*., 2001: 321) Cummins is, however, not clear what 'identities' might be. His use of the term suggests that he is referring particularly to the particular social, cultural or linguistic backgrounds of each student. In these terms, a students 'identities' might include Black, South Asian, Mandarin-speaking, bilingual or immigrant. Collaborative interaction allows students to draw on these different backgrounds as they participate in classroom interaction. Clearly, however, the nature of classroom interaction can result in or reinforce either coercion or collaboration. Coercive interaction, in which particular (generally majority) experiences and perspectives are privileged or imposed on participants are likely to lead students from minority linguistic and cultural backgrounds to disengage. Their participation is likely to be characterised by withdrawal from relevant interaction and resistance to dominant perspectives. Where classroom interaction *empowers* such students, however, they are likely to "participate confidently in instruction as a result of the fact that their sense of identity is being affirmed and extended in their interactions

with educators... Schooling amplifies rather than silences their power of *self*-expression" (Cummins, 2000: 44).

In this paper I want to focus particularly on the role of identity in the empowerment of bilingual students in *mathematics*. How are such students' identities implicated in their talk in mathematics? What happens when cultural or linguistic identities are negotiated? Such questions concern the relationship between identity and interaction. Cummins' (2000) model, however, is largely theoretical and does not address such issues in any detail. Before addressing these questions, therefore, I will outline a theoretical and methodological perspective on identity and interaction. This perspective draws on discursive psychology.

3. Identity and interaction

For discursive psychology (Edwards, 1997; Edwards & Potter, 1992; Antaki & Widdicombe, 1998), drawing on concepts from conversation analysis (e.g. Sacks, 1992), language is seen as primarily social, one of the means at our disposal for the acting in and organising our social world. Psychological notions, including meaning, thinking and identity are not examined as reified processes or mental states located inside people's heads. Instead, they are explored as participants' concerns (Edwards, 1997: 108), brought about and organised by participants through the social practices of their interaction. Identities, for example, are constantly at issue in interaction, available for use as discursive resources. Identity labels or categories are applied as part of the social nature of talk. They can be accepted, tolerated, disputed or negotiated and may be modified in the course of discussion.

Let me give a topical example: in a speech following the attacks of September 11, US President George Bush stated 'Either you are with us, or you are with the terrorists'[4]. He uses two identity categories here, *us* and *the terrorists*, which he places in opposition. In using these categories in this way, he is conducting social business. He places himself as anti-terrorist and attempts to co-opt the support of other anti-terrorists, likely to include most of his audience. In the speech, however, Bush co-opts this group to his 'War on terror', a war not all anti-terrorists necessarily support. In analysing the

[4] President George W. Bush, Address to a Joint Session of Congress and the American People, Washington, DC, USA, 20 September 2001. See www.whitehouse.gov/news/releases/ [active Oct. 2002].

role of identity, then, as in the above example, the focus is on looking at how participants construct and rhetorically deploy their different identities in interaction. Analysis concerns *how* these identities are interactionally constructed and deployed in different ways to suit different occasions and thereby accomplish different social actions (Edwards, 1998: 31). Identities are seen as discursive resources upon which participants in interaction may draw.

Widdicombe (1998) illustrates how the discursive perspective described above may be developed into an analysis of identity in interaction. Her approach focuses on what Sacks (1992) called *membership categories* (see also Lepper, 2000), that is categories used in interaction to assign participants as members of particular groups, such as 'the terrorists'. Widdicombe (1998: 52) argues that category membership and social identity are closely linked, since particular identities imply membership of particular categories and *vice versa*. Participants in interaction make use of identity categories in a number of ways. In particular, the categorisation of individuals may be used to make inferences or draw conclusions about those individuals and what they do. As Widdicombe says:

> The fact that categories are conventionally associated with activities, attributes, motives and so on makes them a powerful cultural resource in warranting, explaining and justifying behaviour...Whatever is known about the category can be invoked as being relevant to the person to whom the label is applied and provides a set of inferential resources by which to interpret and account for past or present conduct, or to inform predictions about likely future behaviour. (Widdicombe, 1998: 52)

President Bush, for example, draws on connotations of the category 'terrorist' as evil-doers whose actions are likely to be abhorrent to most of his audience. In analysing interaction, then, Widdicombe examines moments where membership categories are at stake, such as the example used above. Particular labels may be negotiated, resisted or rejected and alternatives proposed. In looking at such moments, Widdicombe, following other work in discursive psychology (Edwards, 1997) is interested in what, in social terms, such negotiations achieve. What is accomplished, for example, by rejecting one category in favour of another?

In order, then, to explore the role of identity in mathematics classroom interaction, I will draw on an extract from a transcript in which social identity categories are at stake. By analysing how the participants use different identity categories, I show

how such categories enable students to link their task to their own experience of the wider world. Before discussing this analysis, I offer some background to the transcript.

4. Zeb and Afzal

The activity which forms the subject of the transcript concerns mathematical word problems, a form of question used in mathematics around the world. The following problem, for example, comes from a UK national test for 9-10-year-olds:

> Mrs Patel buys **4 milkshakes** costing **65p each** and
> **3 sandwiches** costing **£1.70 each**.
>
> Work out the **total cost**.
> (QCA, 1998)

Word problems such as the two shown above are recognised as presenting difficulties for many students (Verschaffel, Greer & de Corte, 2001). These difficulties relate in part to the need for students to interpret a rather abstract story, minimally conjured up by a few details, and then relate their interpretation to a mathematical calculation. The use of language is also somewhat unusual, such as referring to a named person like 'Mrs Patel', for example, without explaining who she is (Gerofsky, 1996). These features of the word problem genre are likely to be particularly crucial in the case of bilingual students. In addition, the scenarios invoked in the problems are likely to draw on cultural experience, such as that relating to shops and milkshakes, which is assumed to be common to all students but which may be unfamiliar to students from minority cultural backgrounds.

Zeb and Afzal are two 10-year-old bilingual students who attend a British urban primary school. They were participants in a study of how students learning English as an additional language (EAL) take part in primary school mathematics (Barwell, 2002). The transcript is of a recording made as part of that study, which focused on how EAL students engaged with mathematical word problems. Both Zeb and Afzal are from a Pakistani background and both use Punjabi or Urdu at home. They have been assessed by their school as developing proficiency in English but still requiring support. For the recording, the two students were asked to *write* mathematical word problems together. The transcript extract shows them discussing a new problem, their third. The recording

was made in a small office. I am not present at the start of the extract but arrive and intervene before the end.

In looking at this extract I am interested in two features of the interaction shown in the extract. Firstly, a nationality-related identity category, *Englishman*, is used by Afzal to contest Zeb's idea for their word problem. Secondly, Afzal uses the Arabic term, *haram*, from the discourse of Islamic dietary practices, as part of that contestation (for transcription conventions, see appendix):

73 Z come on speed up/ look at your writing it's going all wiggly// me do
74 one/ ^(…)^/ now what
75 A err// I know/ pizzas/ (cheese and)
76 Z how about how about cheese pizzas/ vegetarian pizzas/
77 A yeah no/ um/ how much
78 Z cheeseburger
79 A alright then cheeseburger
80 Z no beefburger
81 A no that's too haram
82 Z no it ain't
83 A yeah it is
84 Z I eat beefburgers/ I ate/ once I ate ten (Monday) night
85 A you're you're you're you're you're an Englishman/ and you/ 'cause/
86 'cause um/ 'cause me (dad)/ um beef is haram/[it **is**
87 Z [trust me/ I never ate it/
88 trust me I never ate it
89 A you **little** liar/ (…)
90 Z cheese//
91 RB how many've you done *RB enters*
92 Z [(…)
93 A [we done we done three/ we're gonna do three

Afzal first proposes that he and Zeb write a problem about pizzas (line 76). Zeb first considers different kinds of pizza (line 76) before proposing cheeseburger as the topic (line 78). Afzal accepts (line 79) put Zeb modifies his proposal to beefburger (line 80). Afzal rejects this suggestion on the grounds that "that's too haram" (line 81). Haram is an arabic term used to describe 'forbidden' food in Islamic practice. In using the term *haram* Afzal invokes a shared identity with Zeb, an identity which includes familiarity with a language (the Arabic of Islam) and religious practices relating to food. Thus an implicit identity category is deployed, of which both students are members.

Zeb accepts the basis of Afzal's rejection but argues with its application. He does not argue that *haram* is a criterion which is irrelevant for their task. Instead he argues that beefburgers are not *haram*. Indeed he backs up his case by citing personal experience, giving a personal account of eating beefburgers in the form of an extreme case formulation (Pomerantz, 1986), "once I ate ten (Monday) night" (line 84). His use of an account of personal experience ("I ate") and of an extreme case ("ten") create a strong defence of his position that beefburgers are not *haram*. Zeb's argument continues to draw on an implicit shared Muslim identity, since to claim that he ate ten beefburgers only works to support his claim that they are not *haram* if he is taken to be a practising Muslim.

Afzal seeks to reject Zeb's defence, drawing on an explicit identity category for the first time, "you're an Englishman" (line 85). The categorisation of Zeb as an Englishman sets up a contrast between Englishmen and the category of practising Muslims that has been implicit in the two students' preceding discussion. Thus an Englishman, in this case is *not* a practising Muslim. Afzal sets up and deploys this contrast as a way of challenging Zeb's idea for the word problem. He therefore uses identity categories as a means to prevail over Zeb. In so doing, he relies on a shared set of experiences, so uniting the two students. At the same time, he uses these shared experiences to attack Zeb, so marking a division between them. In this case his argument is successful as Zeb retracts his earlier account (lines 87-88), allowing Afzal to reinforce his dominant position "you **little** liar" (line 89).

5. Identity and empowerment

In the above extract identity categories play a key role in the two students' negotiations as they work together. In particular, the two students' have linked various aspects of their experience to their work on their task. They have drawn on a shared experience of Arabic and of Islamic practice. They have also drawn on a contrast which is constructed as part of their negotiations between 'Muslims' and 'Englishmen'. On one level these identity categories discursively divide the two students, with one positioned as knowledgeable about correct Muslim practice, the other as contravening the rules of diet. On a different level, however, these identities unite the two students as they draw on their shared experience of these practices. Afzal's argument would not be

effective if he was working with a non-Muslim student. It is important to recognise that negotiation of identities is not the only kind of negotiation apparent in the two students' discussion. They are also, for example, negotiating the nature of mathematical word problems.

Zeb and Afzal are engaged in negotiating aspects of their identities. Their discussion forms part of their ongoing 'long conversations' through which these identities are developed over time (Maybin, 1996). In terms of Cummins' (2000) model, therefore, my analysis indicates that the two students are engaged in an empowering discussion. Their task allows them space to explore different aspects of their identities and to draw on their shared experience of the wider world. This observation raises a question concerning the notions of collaborative and coercive interaction. Cummins defines the former as interaction in which students' experiences can be shared and respected and identities negotiated. By this definition, Afzal and Zeb's discussion appears to be collaborative. On the other hand, coercive interaction occurs when one perspective is imposed on another. Arguably Afzal imposes his interpretation of the nature of *haram* food on Zeb. He does not, for example, give any explanation, partially alluding instead to the authority of his father (line 86). Thus Zeb and Afzal's discussion also appears to be coercive. This contradiction can be resolved by considering the different levels at which Cummins' model works. It is possible that Zeb and Afzal's discussion is an example of coercive interaction at the level of the two students. Afzal imposes his view on Zeb. Their exchange is, however, a few turns of interaction at a micro level. A broader view-point concerns the nature of discourses that are possible in their mathematics classroom. From this position, their discussion can be seen as collaborative and therefore empowering, since the two students *are* able to draw on shared cultural and linguistic (minority) experience, negotiating aspects of identity in the process. That this is possible is evidence that the interaction of their mathematics classroom is of an empowering nature.

Finally, as I noted above, word problems are seen as challenging in mathematics, with bilingual students in particular finding them difficult to make sense of. The interaction between Zeb and Afzal appears to be highly meaningful, regardless of the outcomes of their various disputes and negotiations. Their discussion creates a rich web of meanings relating to both the task in general and their word problem in particular.

This richness is likely to support them in making sense of their own word problem and ultimately in making sense of other word problems such as the one shown earlier in this paper.

6. Conclusion

In this paper I have illustrated the application of an approach based on discursive psychology to questions of identity in mathematics classroom interaction. My analysis shows how two students use both implicit and explicit identity categories as discursive resources as they work on a mathematics classroom task. Their interaction is empowering, in that the two students are able to draw on shared cultural and linguistic experiences and negotiate aspects of their identities as part of their work. These negotiations support their work in mathematics through the development of a set of rich meanings relating to their experience of the wider world.

Bibliographical references

Antaki, C. & S. Widdicombe (eds.) (1998). *Identities in talk*. London: Sage.

Barwell, R. (2002). *The development of a discursive psychology methodology to investigate EAL in primary school mathematics*. Unpublished Ph.D. dissertation, University of Bristol.

Collier, V. (1987). "Age and rate of acquisition of second language for academic purposes". *TESOL Quarterly* 21(4), 617-41.

Cummins, J. (1994). "Knowledge, power, and identity in teaching English as a second language". In F. Genesee (ed.), *Educating second language children*: *The whole child, the whole curriculum, the whole community*. Cambridge: Cambridge University Press, 33-58.

Cummins, J. (2000). *Language, power and pedagogy*: *Bilingual children in the crossfire*. Clevedon: Multilingual Matters.

Cummins, J. & M. Swain (1986). *Bilingualism in education*: *Aspects of theory, research and practice*. Harlow: Longman.

Cummins, J., C. Baker & N.H. Hornberger (eds.) (2001). *An introductory reader to the writings of Jim Cummins*. Clevedon: Multilingual Matters.

Edwards, D. (1997). *Discourse and cognition*. London: Sage.

Edwards, D. (1998). "The relevant thing about her: Social identity categories in use". In C. Antaki & S. Widdicombe (eds.), *Identities in talk*. London: Sage, 15-33.

Edwards, D. & J. Potter (1992). *Discursive psychology*. Sage: London.

Gerofsky, S. (1996). "A linguistic and narrative view of word problems in mathematics education". *For the Learning of Mathematics* 16(2), 36-45.

Gillborne, D. & C. Gipps (1996). *Recent research on the achievement of ethnic minority pupils*. London: HMSO / OFSTED.

Lepper, G. (2000). *Categories in text and talk*: *A practical introduction to categorization analysis*. London: Sage.

Maybin, J. (1996). *Children's voices*: *The contribution of informal language practices to the negotiation of knowledge and identity amongst 10-12 year old school pupils*. Unpublished Ph.D. dissertation, Open University.

Pomerantz, A. (1986). "Extreme case formulations: A way of legitimizing claims". *Human Studies* 9, 219-39.

QCA (Qualifications and Curriculum Authority) (1998). *Year 5 mathematics test*: *Mathematics booklet*. Sudbury: QCA Publications.

Sacks, H. (edited by G. Jefferson) (1992). *Lectures on conversation*. Oxford: Blackwell.

Verschaffel, L., B. Greer & E. de Corte (2000). *Making sense of word problems*. Lisse: Swets & Zeitlinger.

Widdicombe, S. (1998). "'But you don't class yourself': The interactional management of category membership and non-membership". In C. Antaki & S. Widdicombe (eds.), *Identities in talk*. London: Sage, 52-70.

Appendix: Transcription conventions

Bold type indicates emphasis.

/ shows a pause < 2 secs. // shows a pause > 2 secs.

( ) for where transcription is uncertain, (...) indicates untranscribable speech.

^ ^ to enclose whispering.

? is for question intonation.

[for overlapping speech.