

PARENTAL RESOURCES FOR UNDERSTANDING MATHEMATICAL ACHIEVEMENT IN MULTIETHNIC SETTINGS

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This paper examines parental understandings about their child's mathematical achievement and the resources they use to go about gaining information in culturally diverse learning settings. This examination takes place within a critical-developmental framework and draws on the notion of cultural models to explicate how resources are used. Three parental resources of mathematics achievement are scrutinised: (i) the teacher, (ii) exam test results and (iii) constructions of child development. The interviews with twenty-two parents revealed that some resources were concrete, such as examination results. Other resources were symbolic, like the representation of child development, and were less likely to be shared with the school community. Either way, these resources were open to parental interpretations and influenced by parents' own experiences and cultural representations.

Key words: parents, resources, cultural models, achievement, ethnic minority

INTRODUCTION

Within the English school system, like many Western/English-speaking countries, there is a strong emphasis on testing and measurable outcomes for success at school. The introduction of the National Numeracy Strategy and nationwide testing in the primary sector led to a greater pressure for parents' involvement in their children's school education (Bryans, 1989). While many could see problems with using parents as teachers in the home, the problems of engaging parents specifically from culturally diverse backgrounds remained largely uncontested.

The education of ethnic minority children has been given some attention, although less seems to be said about mathematics learning in particular in the UK context. The pitting of one ethnic group over another has tended to overshadow the sociocultural composites of school practices or the "gaps" in cultural understandings of what counts as mathematics learning. The current UK government position is to play down cultural influences on home learning even though the precise form in which home learning is delivered depends on the parents' understanding of the individual child and their development (Goodnow, 1988) as well as judgements of value and cultural practices, often filtered by community experience and past experience (O'Toole & Abreu, 2005).

This paper examines parental understandings about their child's mathematical achievement and the resources they use to go about gaining information in culturally diverse learning settings. Resource is a concept which refers to the way in which the

individual is simultaneously a seeker and provider of information which is open to resistance, interpretation and multiple representations. This examination takes place within a framework which suggests that institutional systems like school reflects a dominating and particular way of looking at children's learning where singular pathways to development, often age-related, are considered "appropriate" or "correct" (Burman, 1994). These conceptualisations influence what we think children should learn and what achievement outcomes are necessary by certain stages of development. As such, expectations for children's achievement are "normed" against particular developmental milestones (Fleer, 2006). The "colonization" of the home by school practices does not attempt to reflect or value family practice but marginalises practices which are not represented by White, middle-class groups (Edwards & Warin, 1999). Equally, parents are privy to limited amounts of information about their child's school life, including their child's mathematics learning and therefore seek other avenues for constructing meaning from an environment from which they are largely excluded.

It is also suggested that when parents utilise and incorporate the resources available to them they do so within the boundaries of particular cultural models (Gallimore & Goldenberg, 2001). Cultural models can be understood in terms of a shared understanding of how the individual perceives the way the world works, or should work. A cultural model is described as:

Encoded shared environmental and event interpretations, what is valued and ideal, what settings should be enacted and avoided, who should participate, the rules of interaction, and the purpose of the interactions (p.47).

Cultural models are often hidden and unrecognisable to the individual and quite often assumed to be shared by others around them. As such, mathematical learning also comes with a knowledge structure which is a reflection of the family or community practices (Abreu, 2008). Parents draw on their own understandings of mathematics learning to make sense of how their child is achieving. The resources they use to do so may have concrete or tangible aspects to them such as discussions with the class teacher or examination results. Others err more towards a cultural model that is representational or symbolic. Both are susceptible to miscommunication and interpretation.

A STUDY OF PARENTAL RESOURCES FOR UNDERSTANDING THEIR CHILD'S MATHEMATICS ACHIEVEMENT IN SCHOOL

The twenty-two parents participating in this study had children in primary schools (ages 5-11 years) situated in a town in the South East of England. Eleven of the twenty-two parents were from ethnic minority backgrounds and the remaining participants were White and British born. The children are characterised as being either high or low achievers in mathematics and were placed as such by their teachers. Data collection took place in three multiethnic schools that are known as

school A (mainly White), school B (ethnically mixed) and school C (mainly South Asian). Data from parents was collected using the episodic interview (Flick, 2000), a method which assumes a shared common knowledge on behalf of the participants about the subject under study. It specifically facilitates the exploration of meanings, representations and experiences. The procedure for analysing the interviews was borrowed from Flick (2000) and based upon the analysis of themes.

Although the study was specifically about mathematics, parents within the sample used this opportunity to talk about their child's education as a whole and therefore the data is highly inclusive of other educational issues. For parents, constructing meaning in relation to their children's mathematics education is like fixing together the pieces of a puzzle and this is managed in a holistic way. In their accounts, parents utilised a varied number of resources to help them construct an understanding of their child's "achievement." The three dominating resources were: (a) the teacher, (b) exam test results and (c) constructions of child development.

Using the teacher as a resource for understanding the child's achievement

The teacher was cited most often as the resource of information about mathematics achievement for the parents in the current study. Of interesting note, is that parents of high achieving children mentioned using the teacher as a resource more than parents of low achieving children (19, 11¹). Furthermore, White British parents mentioned using the teacher for this role more than the ethnic minority parents (17, 13). There are a number of potential explanations for why this might be the case. The parents of high achieving children may not have to worry so much about what will be discussed during consultations, therefore there is less at stake in discussing their child's progress with the teacher. Parents of high achieving, and indeed White British parents are more likely to share cultural models of education, teaching and learning with the school. The discrepancies and conflicts in value positions between home and school for those who do not share cultural models with the school have been well documented by Hedegaard (2005).

On the whole parents' communication with teachers tended to centre around the parent-teacher consultation evening on a twice-yearly basis. Communication between parents and teachers surrounding achievement is complex, and teachers couch many of their descriptions of the child to parents using "teacher talk" whereby descriptions could connote two different meanings. For example, if a child is described as having "leadership qualities" this can also be interpreted as "the child is bossy." "Teacher talk" can produce a discrepancy between the teacher's discussion of the child's mathematics achievement and the parent's understanding of that achievement. For instance, Rajesh's mother asked the teacher in the parents' consultation, "how's he getting on, will he be alright?" and Rajesh's mother recalled that the teacher said:

¹ The figures used in this paper are based on the number of times a resource is mentioned, therefore there are times when one parent mentioned a resource more than once.

Rajesh's mother: "he'll be fine, no point to worry or anything...if he just carries on the way he's doing he's fine" (Indian mother: yr 2, LA)

However, the teacher described Rajesh to me as a low achieving child and his family were categorised as having a low level parental involvement. However, this parent has taken at face-value the message. There are opposing cultural models of Rajesh's learning held by home and school here. Rajesh still struggled to undertake calculations with number below ten, whilst curriculum guidelines stipulate that children of his age should be capable of working with numbers up to 20. This parent has assumed that the teacher would offer the most concrete information around her son's mathematical achievement. Another parent, Fazain's mother, reported a similar conversation she had with a teacher at her son's school:

Fazain's mother: Mr. Headworth, he was saying that he is really good in maths because he comes home and you know, because I improve my maths, you know, a lot. So I teach him, and he's coming really good, he's top in his class (Pakistani mother: yr 6, LA)

Age-related views of mathematics learning are representative of generalised and dominant forms of knowledge which places children outside of these brackets of being an achiever. Fazain was by no means top of his class and was described to me by his classroom teacher a low achieving child. Fazain's mother has attempted to align her own models of mathematics with the schools by improving her own learning, but using the teacher as a resource of information still creates discrepancies.

This next quote from Michael's mother shows what can happen if the interaction with the teacher creates a dissonant cultural model of achievement from the one held by the parent. Michael's mother describes a negative parent-teacher consultation she had experienced. In his first two years schooling, Michael's parents had always been told that he was achieving well. At the most recent parent-teacher consultation, Michael's parents were surprised to be told that he was not doing as well as the others. This change in the representation of her son's achievement by the mother, as a consequence of the teacher consultation, prompted her to question the teacher's judgement:

Michael's mother: As I say, this consultation with Mrs. Edwards didn't even sound like Michael...I thought, she doesn't know this child at all, doesn't even sound like him...and I remember being so cross...and I said to [the head teacher] "what does this child have to do to get any praise?" because I thought it was so unfair. Because he was working hard and yet there wasn't a single thing said that was positive. (White British: yr 2, HA)

Although the teacher was an important resource of information for all the parents as a means of understanding their child's achievement, parents may challenge their opinion if it runs counter to well established models of understanding.

On the whole, parents placed a great deal of emphasis and importance on the teacher's judgement of their child's achievement without always realising that teachers' discourse can be framed to connote multiple meanings. One might speculate

that these discrepancies are even more problematic for the more marginalised parent (such as ethnic minority parents, working class parents, or parents of low achievers), like the mothers' of Rajesh and Fazain, who may have been socialised to understand a more literal educational discourse. For example, these parents took at face-value the "no need to worry" teacher talk. This is unsurprising when models of success are more desirable and the teacher is considered the key authority. Using the teacher as a resource means that conversations take place in a setting which is rigidly framed by a White middle-class institutional structure (Rogoff, 2003) and as such, teachers are in a powerful position. Michael's mother has fewer qualms about challenging achievement representations of the teacher. As such she has the resources to challenge the institutional perspective. It was suggested earlier that using the teacher as a resources of information was tangible or concrete and yet "teacher talk" creates models of achievement which are not necessarily congruent with normative age-graded levels, or parents constructions of their child's achievement.

Using examination assessment results as a means of understanding achievement

Examination results from the Standard Assessment Tests (SATs) conducted in year 2 and year 6 were also resources used by some of the parents. Parents of high achieving children were most likely to speak of examination results in relation to achievement (13, 9), although there was no difference between the White British and ethnic minority parents. In principle, parents should be able to use examinations as a concrete means of understanding achievement. Yet how parents come to understand or use these tests for assessing their child's achievement and construct subsequent cultural models is open to considerable interpretation.

For a start, many of the parents failed to understand how the tests are scored (tests are scored using levels rather than A-G classifications which parents are familiar with). Once again though, parents in this sample of high achieving children had a clearer idea of the scoring system used for the SATs tests. Why this should be the case is uncertain, since the scoring is new for all parents of children currently in the school system. It is likely that these parents are confident in accessing resources like the teacher, websites and shop-bought information books.

The majority of the parents who knew that the SATs examinations were taking place had negative feelings about the tests. Some thought the children were too young and therefore ran counter to their cultural models of appropriate child development practices. Others felt that the SATs examinations were for the schools benefit, and not for the children since results are published publicly and are used to measure the school's success. Rajesh's mother was unique in her opinion about testing and its usefulness in understanding achievement. This may have been because she may have been naïve about how the schools use the test results:

Rajesh's mother: I reckon tests are good because it will show him what he needs to go further on and what he needs to learn...I think he's going to have tests his whole life so

he might as well start now...they're not going to judge the kid, if he's bad or anything it just means he needs more help which is good in a way (Indian mother: yr 2, LA)

Rajesh's mother also held the belief that there would be some kind of positive feedback from the tests, which would help her son realise his mistakes and improve. However, once the final examinations had been finished, none of the schools in this sample revisited the papers and other parents had a stronger insight into institutional motives for testing mathematical achievement. Dale's father shared this low opinion on the value of examinations as a resource for understanding his son's mathematical achievement:

Dale's father: I find going into school reinforces my idea that they put you in a pigeonhole at the earliest opportunity; that's the line, you're this side of the line, you'll always be the worst. Well, all right, he's a couple of digits down on a maths test, it's not the end of the world but to listen to them talk sometimes; is that because of the concern for Dale or is it because they're concerned the school is going to get a bad report because the Stats [*sic*] are down...and I sometimes wonder exactly what it's for, this sort of test thing (White British: yr 6, LA)

Parents described how, in their view, SATs examinations have little value as a tool for helping the child, but are instead used as a form of classification. As such institutional practices are at odds with parental cultural models of what counts as a useful learning experience. Also, the parents look at the SATs exercise with justifiable scepticism. Perhaps these parents know better than Rajesh's mother, that the papers will not be re-visited or used as a learning tool.

With two exceptions the parents of low achieving children had more negative feelings towards the examinations than parents of high achieving children. Parents here were concerned about seeing their children fail, something that is more likely to happen to the low achieving children. Parents' difficulties in interpreting the SATs mathematics examination results revealed that even as a concrete resource of information about the child's achievement, examination results can have their own interpretive problems.

Resources of child development for understanding achievement

One other piece of the educational puzzle, perhaps built upon the most symbolic of all the resources for understanding achievement, was the use of models of child development. Juxtapositioned against the need to understand mathematics achievement was the belief that the children were very much in the early stages of their own development. Parents maintained a cultural model of their children as still being very young which are not necessarily shared by teachers or school as an institution. As a consequence of these dissonant models of child development, tensions were created between home and school. The next quote from Rajesh's mother reveals the conflict between her own model of child development and her desire for her child to be successful early in life:

Rajesh's mother: But then I'm thinking like, his education is important at the moment but it's still a bit of a laugh for him so I don't really want to burden, like I don't want to be like a fussy parent saying I'm pushing him or something...but at the moment you think he's only seven, you don't really want to push him too much, cos you're stuck in the middle. Then you think if he has a good start now then he'll have a good start, you know. I don't know, it's a bit difficult (Indian: yr 2, LA)

Her conflicting model of appropriate parenting and educational expectations for achievement are both tied in with her identity as a good parent. Contained within the quote are three messages which are no doubt conflicting but lead back to her model of child development as the resources of understanding. She does value education and considers it important, but for a boy of 7 years old it should be fun. She is also worried about being perceived as "pushy" if she broke away from her own cultural model of child development. However, Rajesh's mother is unaware that it is her own cultural model of child development which is marginalised by against expectations of the school.

Even when parents have a keen awareness of the cultural models held by the school, these may still be challenged by parents own models of child development. Simon's mother drew on her own experiences as a school child to understand the anomalies between her own cultural models of child development to what her son was experiencing:

Simon's mother: I just think that he's seven, he's in the infants and if I related to when I was in the infants, we never brought homework home until; I think we just had reading. And part of me thinks they're just children, let them be children, you know, if they're happy they'll be learning and I don't want too much pressure on him really (White British: yr 2, HA)

Past educational experiences are embedded in cultural models and linked to the settings where practices take place (O'Toole & Abreu, 2005). Based on these past experiences, Simon's mother has a strong model that school is for learning and home for playing/recreation. Once again, she draws on child development as a resource of knowledge for her cultural model.

A recurrent idea running through parents' models of child development was that of learning as a progressive activity. Learning was viewed by many of the parents as a building block, which develops with the child. The stage-theory representation of child development established through developmental psychology is widespread in these parents' accounts. Learning is described as progressive and based primarily in the childhood years. The crux of the problem is that parents' stage-related views on child development are more varied than one might expect. The variations in parents' models of learning and development are strongly influenced by their own values and experiences, which were culturally situated. However, school as an institution in England relies heavily on constructs established by stage-related theories. Moreover,

they are not necessarily congruent with the models held by the teacher. One of the teachers, Richard, in School B told me:

I still think some parents haven't quite caught onto the idea that they're seven so we should be expecting quite a lot of them. Their expectations of what a child can do isn't as high as our expectations...(yr 2, mixed achievement class)

CONCLUSIONS

When parents talk about their children's mathematics learning they draw on much more than just isolated accounts of mathematics as a subject. Parents try to make sense of their child's mathematics experience by using both concrete and symbolic resources. While some resources, like the teacher and examination results might be considered fairly concrete forms of information for parents, they carry their own problems of interpretation and expectation. For example, whilst "teacher talk" may be a kindness to the parents and child, not all parents have the resources to reinterpret the double meaning. In culturally diverse situations there remains the possibility for discrepancy between the cultural models of learning and achievement between home and school through literal educational discourse. It is noteworthy that the two resources most used, the teacher and examination results, come from the most powerful setting where the knowledge is unidirectional; from home to school. Parents with strong cultural models about their child's achievement can challenge the school. Marginalised parents, or those that sit outside White middle-class institutional confines, tend not to have the resources to either challenge the school or recognise incongruent pieces of information. The least tangible cultural model, child development, resides mostly in the home and is born out of values, expectations, practices and past experiences. This is a resource which is least likely to be shared with the school but is still a pervasive influence in the home.

Furthermore, cultural models and knowledge about achievement have a reciprocal influence on each. A question was raised about whether the cultural model is established before the representation of achievement or whether images of achievement precede the model. The use of cultural models and representations of achievement are seen as constituted from each other, in that they have the power to be transformed, reconstructed and rejected based on the resources that are utilised. In other words, new information about achievement (perhaps resourced from test examination results) may change a cultural model. On the other hand, a steadfast cultural model (perhaps resourced from representations of child development) might be resisted or rejected in light of discussions with the teacher about what a child should be able to achieve by seven years of age.

Whilst institutional practices continue to be dominated by universal/western notions of development which are characterised by White, middle-class value-positions then some homes and their cultural practices will be marginalised. Furthermore, these homes and their families will be positioned as incompetent or lacking knowledge.

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