Making sense of homework: Parental resources for understanding mathematical homework in multicultural settings.

Sarah Crafter (The Open University, UK)

Abstract

Parental involvement in children's homework is strongly endorsed and encouraged by political and educational policy in the UK. However, involvement in mathematics homework is said to be particularly problematic for parents because of changes to the curriculum since their own schooling, the introduction of multitudinous mathematical strategies at school, and in the case of multicultural communities, an ever-increasing heterogeneity of learning experiences amongst parents. Using the theoretical framework of cultural models and cultural settings this chapter examines the kinds of resources parents use to make sense of their child's mathematics homework. Two parental resources for making sense of mathematics homework are scrutinized: (a) the child, and (b) cultural models of child development. The interviews with twenty-two parents revealed that these resources were highly intangible and often symbolic models which were open to misunderstandings, resistances and transformations. Also, the child could be an active or resistant co-constructor of these Resources which subsequently informed the homework setting.

Introduction

Educational and political policy in England has for some time promoted the idea that parental involvement in children's homework is a powerful indicator of achievement success in school (Department for Children, Schools and Families, 2008) despite mixed evidence from the academic research literature (Farrow, Tymms, & Henderson, 1999). This has led to a dual understanding in the way the relation between home and school learning is perceived. On the one hand home and school are placed as very separate institutions in that parents are prescribed the main responsibility for shaping and moulding the child into an educated and economically viable adult. On the other hand children are seen as both active and passive

harbingers of school values which the child takes home through their transitions between contexts (Edwards & Alldred, 2000). In the case of the research study reported here, children take home to their parents, mathematical material learnt in the classroom in the form of mathematics homework. In multicultural settings the parents must try to make sense of the mathematical material sent home from school when their own past educational experiences are the most obvious provider of information (O'Toole & Abreu, 2005). This chapter examines what resources parents, with a variety of educational experiences, use to understand their child's mathematics homework. Resources are meaning constructs for understanding and making sense of particular phenomena, like homework. 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 (Crafter, 2009).

This examination takes place within a framework which supposes that mathematical learning is not a neutral or culture-free subject (Swanson, 2005; Abreu & Cline, 2003). Sociocultural theorising of mathematical activity links both social and cultural context with cognition (Abreu, Bishop & Presmeg, 2002) and the two most predominant contexts for children's mathematical learning are home and school. In other studies with ethnic minority communities looking at mathematical learning, researchers like González, Moll and Amanti (2005) have noted that home and school learning has traditionally been a one-way street. Mathematical information often goes from school to home but there is little expectation for home traditions, representations and practices in mathematics to be returned. School as an institution is culturally constructed and its practices are based on the colonisation of those who are not in white, middle class positions (Rogoff, 2003). However, the knowledge that parents bring to the home learning situation is heterogeneous because of their own varied educational and cultural experiences.

Shifting levels of migrancy and increasing heterogeneous populations implies new challenges for educational systems across Europe. Despite this, there is still a strong political drive to have parents involved as a partner in their children's learning (Crozier, 2000). However, the messages sent out to parents on behalf of the government tend to be somewhat ambivalent in that parents (and teachers) are blamed if standards fail to be raised but must also be allies to the government to raise standards (Cullingford & Morrison, 1999). Whatever mixed messages come from the state; the school continues to view itself as the champion of

parental involvement. This political machine continues unabated as the William's Report recently proposed that parents are a powerful and enduring force in their children's education. This was taken one step further when it was stated: "Parents should be at the centre of any plan to improve children's outcomes, starting with the early years and continuing right through schooling" (Department for Children, Schools and Families, 2008, p.69). This raises complex questions – which parents and whose knowledge is most advantageously applied?

What it means to be parentally involved is fairly far-reaching and all together ill-defined (Solomon, Warin, & Lewis, 2002). To be involved could refer to maintaining contact with the school, attending consultations with the teacher, watching sports days and plays, or taking on more active roles like belonging to the governing body. This chapter will focus on the most obvious form of parental involvement which is homework. In this instance, homework refers to the tasks set by teachers based on classroom practices and sent home for pupils to carry out in nonschool hours (Cooper, 1989). Evidence surrounding the advantages of having parents involved specifically with mathematics homework is ambivalent. In a study by Sheldon and Epstein (2005, p.204) schools that "effectively implemented" activities to support mathematics homework were said to have a beneficial effect on achievement. However, a more recent and extensive synthesis of parental involvement in homework concluded that while this was true for other subjects it was not the case for mathematics (Patall, Cooper & Civey Robinson, 2008). For one, major educational and curriculum changes means that parents have very different experiences of mathematics learning compared to their children (O'Toole & Abreu, 2005; McMullen & Abreu, 2009). Moreover, the variety of mathematical strategies available may make the homework situation too complex.

Expectations for children's schooling, particularly in countries like the UK, USA and much of Western Europe centre on providing children with unifying representations and values around what "education" means and what types of learning should take place (Goodnow, 1990). In the mathematics classroom this requires both the teacher and pupils to share a world view of the colonisation of number and in turn, the colonisation of mathematical practice in all settings (Bauchspies, 2005). 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). Reay and Lucey (2000; cited in Street, Baker & Tomlin, 2008) argue that the middle classes have

aligned their discourses with the school to create an advantage, whilst working classes may (or may not) resist such colonisation within the home. Similar arguments can be made in relation to ethnicity.

From the schools point of view, if parents are to play a key role in their children's mathematics learning at home and if homework as an extension of classroom practice is to succeed, then practices in the home must be normalised (Crozier, 2000). However, homogeneity in home communities cannot be assured. The UK context is complicated in that in many of the larger towns there is a substantial degree of diversity around ethnicity, language, class, practices, traditions and representations of education and learning. Studies in the US who borrow from a sociocultural perspective tend to rely on homogenous communities (Andrews & Yee, 2006) such as Mexican immigrants (González et al., 2005) or specific Latino communities (Gallimore & Goldenberg, 2001). The same cannot necessarily be said for studies in the UK.

Given these complexities it is not surprising that some parents find it difficult to understand their child's mathematical homework but draw on a variety of resources to make sense of their child's school learning to help them succeed. A 'source' provides information, often in the form a book or person and suggests passivity on the part of the receiver. Parents can also seek out information in an active fashion. Parents operate in both of these ways to explore and examine the educational world of their child. Of particular note is that parents can use a resource in different ways; they may be resisted, reinterpreted or misunderstood. One might suppose that mathematical homework, particularly work sheets and booklets are a fairly concrete resource. However, it is argued here that resources which seem very concrete and "objective" may also be susceptible to miscommunication or interpretation because individual past educational experiences can lead to multiple representations (Crafter, 2009).

As such, Resources may be influenced by pre-existing or developing 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" (Gallimore & Goldenberg, 2001, p. 47).

Cultural models are often hidden and unrecognisable to the individual and quite often assumed to be shared by others around them. 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 mathematical homework or conceptualisations of "education." Cultural settings refer to those activities, which cause people to come together to perform a joint activity. These activities are frequently mundane and played out in the repetitious routines of everyday life, such as the parent who counts the items on a shopping list with the help of a child or the family sitting down together to watch a favourite TV programme. For example, a parental cultural model that teaching is the schools responsibility and should not be done in the home will influence the practices within that cultural setting. Or, the parent who has a model that their own mathematics is very bad could influence the cultural setting during homework.

Studying parental resources for understanding mathematical homework and 'education'

Respondents

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 22 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 using examination results data and teachers' own representations of achievement.

Collecting and analysing the data

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 and representations in combination with examples of experientially based concrete circumstances. The question is posed in two parts, the first part seeking to elucidate the narrative/semantic aspects of the phenomenon under study and the

second asking for a concrete episode by way of an example. Some examples from the interview which are relevant to this analysis are:

- Does your child bring any maths homework home? Can you tell me about what she/he has been doing recently?
- Is there any type of homework you would like to see more of? Can you tell me about that if there is.
- Is the way you help with their homework different now from when they were younger? Can you tell me about that?
- Would you say that on the whole your child enjoys their maths homework? Describe to me a situation when that was the case.

Thematic coding was the procedure used for analysing the interviews (Flick et al, 2003) which began with the transcribing and thorough reading of the data. Coding was then conducted in two steps and 'data-driven' (Braun & Clarke (2006) which involves collecting data relevant to a particular phenomenon (in this instance 'understandings of homework'). The first step involved extracting text where parents made mention of their understandings of their children's homework. The second step involved taking this data and sorting it into various foci of understanding in the form of resources. In their accounts, parents utilised a varied number of resources to help them understand their child's homework. The two dominating resources were: (a) "the child" and (b) cultural models of child development and for reasons of space, these have become the focus on this analysis.

Analysing resources for understanding homework

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, making sense of their children's mathematics education is like fixing together the pieces of a puzzle and this is managed in a holistic way. Homework was particularly crucial to parents as a means of constructing cultural models and formed part of the 'puzzle' in understanding their child's learning on a week-by-week basis. Homework operates to connect classroom practices with home learning. However, taking into account the changes to the mathematics curriculum since parents were at school (see McMullen & Abreu, 2009), the multiple strategies available to solve

mathematical problems (Patall et al, 2008) and the difficulties this raises for helping with their child's home mathematics learning, it is not surprising that it could be a source of conflict (Edwards & Warin, 1999) and misunderstandings. Resources were necessary for making sense of the mathematics homework.

Using 'the child' as a resource for understanding homework

As the only figure regularly making the transition between home and school it is not surprising that 'the child' was a key resource for parental cultural models of homework. It is not simply that the child provides information about homework which the parents then utilise during homework activities; though this may be the case. Rather, parents' cultural models around mathematics homework are informed, developed and maintained with the child in mind. What is crucial here is that these resources may have little to do with direct tuition and mathematical strategy. Also, cultural models of homework and the child as a resources are reciprocally supporting one another in a regular process of maintenance and transformation (Zittoun, 2008). The child as a resource goes beyond, and is inclusive of mathematical strategy, to explain the purpose homework may serve and parents' cultural models of the best way to go about managing the homework situation. Parents considered that there were two major purposes to having homework, and they had little to do with the direct advancement in learning. The first purpose parents thought homework served was to increase their child's levels of independence and responsibility in their learning. The following two quotes reveal how homework for independence and responsibility is conveyed through the parents' talk:

> James' mother: We always try as much as possible to make him, or to get him to do it on his own cause that's the whole point of the homework
>
> (White British: school A, 5/6 years, HA)

> Amira's mother: If they give them homework the children feel they have to be more responsible, they think they have to do this and take it back and they're more excited…and if they don't do homework they have to stay back or something, then they will sit down and do it, they will worry about it more, feel more responsibly that they have to do that
>
> (Pakistani: school A, 10/11 years, LA)

Both of these parents have a cultural model of homework as a learning skills tool. The mathematical content does not, at this juncture, take centre stage. With the child in mind, homework is a tool for personal enhancement; to create learner independence and responsibility. James' mother takes personal ownership of the homework setting in a way that aligns her cultural model for the purpose of homework with the school. As an explanation for her daughter's lack of independence, Amira's mother puts the onus on the school to encourage and create a culture of responsibility in her own child. This is not because she lacks this commitment as a parent, but simply because the struggle to encourage her daughter to take responsibility keeps failing. She told me:

> Amira's mother: Amira's a bit lazy, she doesn't like to give her brain hard work, she doesn't like to use her brain much. She would rather have me do it; most of the time she'll say "mum, can you do this for me"? and I say "it's not my homework, you do it." I tell [her] which way to go about but she'll keep on pushing until I really do tell her, so I'll get fed-up and I'll give her the answers, until I have to really put her in her place and say "look, this is your homework, not mine."
>
> (Pakistani: school A, 10/11 years, LA)

Here, "the child" is an active resource in driving the homework setting and in this case, an active resister for what her mother would consider to be an appropriate cultural model for doing homework. Amira's mother's model around the purpose of homework, namely her child's development of responsibility, is not arbitrary. It follows on from interactions with her daughter where she (the child) has become the Resource for the cultural model of homework. The conflict brought about by homework raised by Amira's mother was a problem for some of the other parents sampled. Mathematical homework as a particular harbinger of conflict and tension has been raised in previous research (Hughes & Greenhough, 2007; Patal et al., 2008). When conflict occurs, cultural models around the purpose of homework become clouded. The parent needs the child as a resource to complete the homework successfully but at the same time must take on the role of teacher to help sustain their child's concentration. The next quote is from Amy's mother:

> Amy's mother: Amy is somebody who; like some children like to do homework but she doesn't really like to do homework at all, it's like a job to get her to do anything really. I mean if you really, really encourage her then she'll do reading and that but to get her to do anything else is a bit of a chore I must admit
> Sarah: Do you end up having a bit of a struggle?
> Amy's mother: We do actually, I mean, if my husband tries to do it with her she just really, really plays him up. But as I encourage him to make it sound a bit fun then she'll do it with you…she just don't really like homework, she'll mess about with

> anything rather than do her homework really
>
> (White British: school B, 5/6 years, LA)

Amy appears to actively resist her home learning which in turn means she resists her mother's cultural model of the 'ideal' homework setting. Amy's mother has understood that to enact the role of teacher in the homework setting leads to conflict. Therefore, the homework setting cannot be an extension of their daughter's classroom practices. Instead it is necessary for her to develop alternative strategies in order to "make it sound a bit fun." This parent has had to develop new resources leading to the alteration of her previous cultural model of homework practices. This highlights problems with employing parents as holders of expert knowledge (Crozier, 2000).

Dale's parents (White British: school A, 10/11 years, LA) also reported a similar struggle with him at home:

> Dale's mother: I've not seen him bring very much maths homework home, but having said that, he tends to do his homework with his Nanny, that's his grandma, rather than somebody who just looks after him. But as far as maths recently is concerned, he's still quite, he's still at quite low levels on it, you know, where we have been talking to him about maths he still finds multiplication difficult. He still finds some fairly simple mental arithmetic quite difficult... he' not good at doing homework, it's a real battle with him, a real sit down and that's why we tend to get Nanny to do it; as soon as he gets out of school because he's still in "school mind" before he's got home and the Play station and the Tele and all that have taken over. So he goes to the library to do it...

Dale's parents try to reconcile their cultural models of his low mathematical achievement (confirmed by being in the lowest mathematics set at school and doing poorly in examinations) whilst trying to comply with institutional expectations to be involved with homework. Although Dale's parents cared about his success in school his active resistance in being a resource for mathematical homework meant that his parents drew on other strategies to manage the setting. In this case they enlisted the help of the Grandmother to ensure he did his homework. We do not have the full information here, but the suggestion is that he went to the library to do his homework alone. This would be at odds with the institutional models for parental involvement in homework. Furthermore, Dale's parents presented a model that if they pushed him too much, it might "turn him off" to learning.

This next parent spoke about how the teacher actively encouraged the child to be a resource in the homework setting. The teacher orchestrates a cultural model for the parent that homework is an interactional event with the child as a pseudo-teacher:

> Sarah: Does Jamal bring any maths homework home? Can you tell me what he's been doing recently?
> Jamal's mother: He does, yeah. The last homework was adding, three digit numbers. The one previous to that was some puzzles, he was set a puzzle and he had to work it out for himself. Like he had, "someone went to the beach and he had thirty pebbles, divided by, I mean, if they collected those pebbles how many would there be?" something like that. With them, he needed help, but I spoke to the teacher and she said "this homework was set so the parents and children could get involved and help each other," so.
>
> (Bangladeshi: school A, 5/6 years, HA)

Historical changes to the curriculum have meant that difficulties arise for both parents who have and have not been educated in the UK (McMullen & Abreu, 2009; O'Toole & Abreu, 2005). However, parents' own past educational experiences make salient certain elements of their experience for their current cultural models of homework. For example, Jamal's mother, who was a British born Bangladeshi with a high achieving child, described no feelings of discomfort in using her child as a Resource for helping with homework. However, for Elena's mother, her education in a different country (France) is at the forefront of her cultural model:

> For me it's hard to explain to her when she says "mum, I don't understand" because I've never done that before and unless I know what they're talking about I can't help her because to me, it's such a long time ago since I've been to school, it's so different. I've been in a different country as well, it's just so hard for me to explain to her when she doesn't understand; just guess I suppose.
>
> (Mixed-heritage; school C, 10/11 years, LA)

If the child is not able to explain school mathematical strategies then parents find it difficult to use them as a resource. For Elena's mother her education outside of England compounded the feeling that she could not help her daughter. However, British born and educated parents can face similar difficulties because of changes to mathematical strategies introduced through the National Numeracy Strategy in 1999. For example, difficulties arose for Lee and his mother (White British: school B, 10/11 years, LA) when he couldn't be used as a resource for

understanding long division homework. Lee couldn't explain to his mother how to do long division using classroom strategies so he could not act as a useful Resource in the joint homework setting. In the end his mother spoke to the teacher.

Rajesh's mother supplemented homework from the school with sums which she wrote out herself based on the types of worksheets sent home by the school. She considered these a compliment to what the teacher supplied because she tried to build on her son's mathematical weaknesses. Despite being placed in the lowest set at school and being cited by the teacher as a low achiever, Rajesh was an enthusiastic and willing home learner. In the first part of the quote his mother talks about providing a list of additions and subtractions mixed up, which she showed me during the interview:

> Rajesh's mother: So he comes home right, like one day we do maths and he's like "yeah, yeah I wanna do maths" so I give him that and then he just does it. I keep on doing the basics with him because they said at school he had problems doing the three numbers, because he got confused adding the three numbers [e.g. 10+5+3]. So now he's better like, he does make mistakes so then we go over it again... I try and confuse, I try and put a take away in with the add, cause he tends to just zoom past without realising what...
> Sarah: And then you've done here little lines for the numbers? [a number line]
> Rajesh's mother: He does that, that's his, that's how he works it out. I just write it out and then the normal, and he's still a bit confused with the changing around so I do that once every week, I just give him one now. So now he's got the hang of it.

While Rajesh's mother and Rajesh both enact a homework situation which is reflective of the cultural practices of the classroom, it is Rajesh who provides the resource for completing the mathematics. He brought from the classroom the number line which was learnt at school but used at home to complete his additions and subtractions.

There are three emergent patterns here for how "the child" is used as a resource for constructing a cultural model of homework. The child may be an active resource, like Jamal, who is happy to be co-teacher with his mother in the homework setting. He was a high achieving pupil who could clearly explain mathematical strategies used in the classroom in the home setting. The child may be an active resister for being a resource which was the case Amira, Amy and Dale. In Amira's case her apparent "laziness" helped her mother construct a

cultural model of mathematics homework as a tool for developing independence and responsibility. She coupled this with a cultural model that school should be responsible for instilling this ethos of responsibility towards home learning. Amy's mother could not use her child as an active resource because of her resistance in being part of a joint homework setting. Parents also talked about the child as a passive resource, so the cultural model of homework is developed with the child in mind but the model is imposed on them, which was the case for James' mother.

Using cultural models of child development as a Resource for understanding homework

Cultural models of child development, whilst used pervasively as a resource (see Crafter, 2009, for models of achievement) were also symbolic constructs which fed into models of homework. At times the parents were specifically asked by me to comment on age but at other times spontaneously evoked cultural models of child development to make sense of homework learning. For some of the parents in this study the cultural settings of the homework interactions had changed as their children grew older, even for those parents who had children as young as six and seven years old (Year 2 in the English school system). Parents enjoyed the increasing independence their children experienced with age during the homework learning. Jamal's mother explained how the Resources she needed for helping with homework altered as her son aged:

> Jamal's mother: When he was younger I think we had to go into it in more depth, like explain it word for word. Whereas now, he does understand what needs doing but it's just a matter of how to work it out.
>
> (Bangladeshi: school A, 5/6 years, HA)

The skills a parent needs for helping a child with homework can be multitudinous and the investment that parents make potentially far-reaching (Solomon et al., 2002). The data in this study suggests that those skills are tested as much with a young child as they are with an older child. It is not necessarily the advanced stage of mathematics that counts, but the ways in which parents need to find explanations for the mathematics that can be problematic. Even though Jamal was only six years old, his mother's cultural model of child development is tied with the homework setting in that there was a growing autonomy on the part of her son.

Parents' use of models of child development as a resource to help with homework formed part of the approach adopted by Samuel's mother. She described the way she learnt to adapt her communication skills with her son during their homework settings. I asked her whether the way she helped with her son's homework was different from when he was younger:

> Samuel's mother: Well I suppose in a way because I don't sit as much with him and also in the younger days I was like "no, no, no, mustn't do it like that, no, no, no" and I've learnt not to do that and I've stepped back. What he's done and completed I would say "oh that's good, what do you think you can do to improve it?" so I've changed, yes I've changed the way I might approach the same problem, my attitudes different
>
> (Mixed Heritage: school B, 5/6 years, HA)

This mother had used her models of child development as a resource for developing new interactional strategies in homework settings. This mother found different ways of conversing with her son to aid his mathematical learning (Smith, 2003).

Equally, it is notable that both Jamal and Samuel were high achieving children. We may surmise that models of child development were a salient Resource for these parents because they afforded a less conflictual homework setting. One of the aspects of the homework scenario, which seemed to set apart the parents of high achieving and low achieving children in this sample was the adaptability and strategies used to deal with the homework setting. In contrast to the parents above, Amy's mother described the homework setting with her daughter as altogether different:

> Sarah: Is the way you help with her homework different now from when she was younger? Can you tell me about that?
> Amy's mother: Probably a bit more, if she's got homework it's got to be done, obviously wouldn't get her to do it when she was younger, if she didn't want to do it when she was younger I didn't force the issue but now, if she has got homework and it's got to be done then I have to sort of try and make her do it really. So it's probably more stricter to do it
>
> (White British: school B, 5/6 years, LA)

Amy's mother struggled to get her daughter to engage in many educational activities at home but the institutional pressure to do the work had increased alongside changing cultural models

of child development. The demands from political and institutional contexts on parents' means that Amy's mother had gone from avoiding the homework setting in her daughter's younger years, to forcing her to do the homework as she had grown.

Cultural models of child development also work as a resistant resource for homework. Not all parents were happy to have mathematics homework and cited models of child development as one of the contributing issues:

> Jennifer's mother: I don't think seven year olds should have to bring homework. I think they're at school from nine till three thirty and I think that for a seven year old that is probably quite enough really
>
> (White British: school B, 5/6 years, HA)

> Sarah: Is there any type of homework you would like to see more of? Can you tell me about that if there is?
> Simon's mother: Um, the other way really. I just, like I say I don't want, I think, they're children, they're little; he's in the infants still. I just think, just now and again to encourage them and get them going but I don't want to see too much put on them at this stage because I think their childhood is taken away with the pressure of sitting down and doing homework… I don't want to put too much on them and I think, let them have their playtime and be with their friends and not too much homework and things like that. I want them to be children, they grow too quick
>
> (White British: school B, 5/6 years, HA)

The cultural models about child development held by these parents are at odds with those held by the school institution. As one teacher commented "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." These vying cultural models between home and school can create conflicts between the values and positions represented there (Hedegaard, 2005).

Up until this point, the quotations from parents about models of child development as a resource for understanding homework have all been from parents of Year 2 (aged 6/7 years) children. The parents of Year 6 (aged 10/11 years) children also drew on child development as a resource for developing/reconstructing cultural models about homework. The issues raised by the parents of the older children were very similar to those of the Year 2 parents. With age there comes an increased level of independence, which some parents found helpful

in the homework setting. The following quote is an exemplification of this point and was described by other parents of both high and low achieving children:

> Sarah: Is the way you help with their homework different now from when she was younger? Can you tell me about that?
> Elena's mother: It is yeah, because she knows more about it than I do, if you know what I mean. Most of the time she just asks because she's not sure but she'll tell me more about her homework than I can tell her. When she was younger it was so much easier for me to tell her what to do, and how to do it and now I think "what are they talking about?"
>
> (White European: school C, 10/11 years, LA)

As her child grows Elena's mother sees the gap between her own knowledge and that of her child growing wider. Fleer and Richardson (2008) argue that Vygotsky proposed a pedagogy which looked forward in child development rather than to the past, which is often the case in current educational realms like school. However, the home is also a site where, particularly for mathematics learning, views of the future can be fraught with insecurities. For Elena's mother, being able to help with mathematics at home becomes increasingly difficult.
Dale's parents, like some of the year 2 parents, were against homework altogether for the primary years:

> Dale's mother: I'm against it personally. I'm not happy that they have so much homework at his age really, I think it just turns kids off school sometimes if you're giving it to them at six, seven, eight, nine. When they get to high school, twelve, thirteen, perhaps give them homework but at that age…I just think the schools dump a lot on the parents, 'oh, you're behind, do it at home', you know.
> Sarah: So you feel there's a bit of pressure on you to make up for?
> Dale's father: Shortfalls of the schools, yeah
>
> (White British: school A, 10/11 years, LA)

It must be noted that Dale's parents were the only ones in the sample to feel that a Year 6 pupil should not have so much homework. One might interpret from the quote above that the issue is not just one of child development however, but of the parents' representation that school as an institution struggles to meet a standard of education and uses the parent as a pseudo-teacher – something (Crozier, 2000) coined as the ethos of "self-helpism" (p. 10). As

parents, their opinion may be more pronounced because they have a child who is struggling to achieve in the educational system.

Three fundamental issues were raised when looking at models of child development as a resource for feeding models of homework. Firstly, that as their children grow parents are both relieved to see increasing levels of independence which makes explaining mathematics easier, alongside fear about keeping up with mathematical complexities in the future. Secondly, Amy's mother felt on omnipresent pressure from the school institution to make her child do her homework even she was actively resistant. When her child was younger she did not feel the need to pressure her to complete homework but this model had altered as her daughter developed. Other parents, particularly those with children in Year 2 (5/6years old) were resistant to the imposed cultural model of child development held by the school and closely linked with the model of homework.

In summary

When parents spoke about their children's mathematics homework it was clear that parents used the homework setting to make sense of wider educational issues. The resources written about in this chapter were borne out of this sense making through data-driven coding of parental understandings of homework. In other words, the resources acted as a mechanism for making meaning. As argued earlier in the paper, resources and cultural models have a reciprocal relationship with one another. Resources can be influenced by pre-existing cultural models or cultural models can be drawn on as a resource; as was the case of models of child development. This is because resources themselves are not necessarily stable but transformative, and seemingly concrete resources like examination results are open to misunderstandings and interpretations (Crafter, 2009).

Even when parents talked about "the child" as a resource for their cultural models of homework, descriptions of *how* the child was a resource varied. The child could either be active, passive or resistors to being used as a resource. Those who are achieving well appear to bring classroom mathematical strategies into the home setting with ease and therefore seem comfortable to be used as a resource. Other pupils took on a resistant role in the cultural homework setting perhaps because they found the work difficult and could understand little about the benefits. There has been scarce evidence which looks the meanings of homework

held by students and even less to suggest that they perceive the benefits of homework to be the same as they are for adults (Warton, 2001).

Cultural models of child development were an interesting resource in the sense that they are themselves highly symbolic and intangible. Models of child development are inextricably linked with mathematical homework in determining what parents think children should be able to do and how the homework setting is played out. Parents can also use these models as resources for resistance by considering them too young for receiving any mathematical homework at all. A few spoke of the relief that came with increasing independence in their child's homework setting as they grew older. This provides some indication for the difficulties that are particularly reported around the subject of mathematics and parental involvement (Patall et al., 2008).

Through all of the analysis on parental resources for understanding the homework setting what is perhaps most telling is what parents did *not* talk about. Namely, that the teacher as a resource of information for models of mathematical homework had little sway in the talk of the parents in this study. That is not to say that parents did not speak about interactions with teachers concerning homework, they were however relatively rare. So why did parents rely on the child, or models of child development as a resource to construct their meanings of homework? The first reason might simply be a matter of ease and frequency. In other words, the parent sees the child on a daily basis and therefore they are the most regular provider of information. For the Year 6 (ages 10/11 years of age) parents in school A, gaining access to the teacher was difficult because of the spatial barriers the school had erected - parents were not allowed on to the school grounds unless they had made a prior appointment. Some of the parents described how some teachers were more difficult to approach than others. These are both issues, which might lead a parent to seek less concrete Resources for their meaning constructs.

In some instances school had encouraged the use of "the child" as a resource for collaboration in the homework situation. Richard, a teacher in school B (teaching 5/6 year olds) for example, liked parents to ask the child questions about their homework if the parent lacked an understanding about what the child should be doing. In engaging in this interaction, Richard believed the child increased its own level of understanding about the homework. However, as already discussed, the child can also be an active resister, sit on a fairly wide

spectrum of achievement and in most instances, be doing mathematics in a different way to their parents. While in theory having the child as an active resource in collaboration may seem a positive idea and tended to be endorsed by the teachers, it makes life difficult for parents when the child is unable to access classroom-based mathematical knowledge in the home setting.

The advantages of having parents involved in mathematics homework is not nearly so clear-cut as government policy endorsed by documents such as the Williams Report (Department for Children, Schools and Families, 2008) suggests. Major educational and curriculum changes makes mathematics homework particularly difficult as an extension to classroom-based practices because it requires learning practices in the home to be normalised (Crozier, 2000). Parents, who are far from being a homogenous group, must try and make sense of mathematical homework with the resources that are available to them. The resources that they choose may be open to resistance and misunderstandings and act in a reciprocal way to be both influencing, and influenced by, cultural models surrounding learning.

References

Abreu, G., de, & Cline, T. (2003). Schooled mathematics and cultural knowledge. *Pedagogy, Culture and Society*, Vol.11(1), 11-30.

Abreu, G., de, Bishop, A., & Presmeg, N. (2002). *Transitions Between Contexts of Mathematical Practices.* Dordrecht: Kluwer.

Abreu, G., de (2008). From mathematics learning out-of-school to multicultural classrooms: A cultural psychological perspective. In L. English (Ed.), *Handbooks of International Research in Mathematics Education* (pp. 352-383). USA: Lawrence Erlbaum Associates.

Andrews, J., & Yee, W. C. (2006). Children's 'funds of knowledge' and their real life activities: two minority ethnic children learning in out-of-school contexts in the UK. *Educational Review*, *Vol.58*(4), 435-449.

Bauchspies, W. K. (2005). Sharing shoes and counting years: mathematics, colonization, and communication. In A. Chronaki, & I. M. Christiansen (Eds.) *Challenging Perspectives on Mathematical Classroom Communication* (pp. 237-259). US: Information Age Publishing.

Cooper, H. (1989). Synthesis of research on homework. *Educational Readership, Vol.47*, 85-91.

Crafter, S. (2009, February). Parental resources for understanding mathematical achievement in multiethnic settings. *Paper presented at the 6th Conference of the European Society for Research in Mathematics Education* (pp. 14-22). Lyon, France.

Crozier, G. (2000). *Parents and Schools: Partners or Protagonists?* Staffordshire: Trentham Books Limited.

Cullingford, C., & Morrison, M. (1999). Relationships between parents and schools: a case study. *Educational Review, Vol.51*(3), 253-262.

Department for Children, Schools and Families. (2008). *The Williams Report of the Independent Review of Mathematical Teaching in Early Years Settings and Primary Schools.* DCSF Publications.

Edwards, R., & Alldred, P. (2000). A typology of parental involvement in education centring on children and young people: negotiating familiarisation, institutionalisation and individualisation. *British Journal of the Sociology of Education* , *Vol.21*(3), 435-455.

Edwards, A., & Warin, J. (1999). Parental involvement in raising the achievement of primary school pupils: why bother? *Oxford Review of Education*, *Vol. 25(3)*, 325-342.

Farrow, S., Tymms, P., & Henderson, B. (1999). Homework and attainment in primary schools. *British Educational Research Journal* , *Vol.25*(3), 323-342.

Flick, U., Fischer, C., Neuber, A., Wilhelm Schwartz, F., & Walter, U. (2003). Health in the Context of Growing Old: Social Representations of Health. *Journal of Health Psychology, Vol. 8*(5), 539-556.

Flick, U (2000). Episodic Interviewing. In M.Bauer & G.Gaskell (Eds.). *Qualitative Researching with Text, Image and Sound: A Practical Handbook* (pp. 75-92). UK: Sage Publications.

Gallimore, R., & Goldenberg, C. (2001). Analysing cultural models and settings to connect minority achievement and school improvement research. *Educational Psychologist, Vol.36*(1),
45-56.

González, N., Moll, L. C., & Amanti, C. (2005). *Funds of Knowledge: theorizing practices in households, communities, and classrooms.* New Jersey: Lawrence Erlbaum Associates Inc.

Goodnow, J. J. (1990). The socialization of cognition: What's involved. In J. W. Stigler, R. S. Shweder, & G. Herdt (Eds.), *Cultural Psychology: Essays on comparative human development* (pp. 259-286). UK: Cambridge University Press.

Hedegaard, M. (2005). Strategies for dealing with conflicts in value positions between home and school: influences on ethnic minority students' development of motives and identity. *Culture & Psychology*, *Vol.11*(2), 87-205.

Hughes, M., & Greenhough, P. (2007). 'We do it a different way at my school': Mathematics Homework as a Site for Tension and Conflict. In A.Watson, & P.Winbourne (Eds.). *New Directions for Situated Cognition in Mathematics Education* (pp. 127-150). Springer.

McMullen, R., & Abreu, de. G. (2009, February). Parents' experiences as mediators of their children's learning: the impact of being a parent-teacher. *Paper presented at the 6th Conference of the European Society for Research in Mathematics Education* (pp. 53-63) Lyon, France.

Fleer, M., & Richardson, C. (2008). Mapping the transformation of understanding. In P. F. Murphy, & F. McCormick, (Eds.), *Knowledge and Practice: Representations and Identities* (pp. 138-151). Sage Publications Ltd.

O'Toole [now Crafter], S., & Abreu, G., de (2005). Parents' past experiences as resources for mediation in the child's current mathematical learning. *European Journal of Psychology of Education*, *Vol.20*(1), 75-89.

Patall, E. A., Cooper, H., & Civey Robinson, J. (2008). Parental involvement in homework: A research synthesis. *Review of Educational Research*, *Vol.78*(4), 1039-1101.

Rogoff, B. (2003). *The Cultural Nature of Human Development*. Oxford: OUP.

Sheldon, S. B., & Epstein, J. L. (2005). Involvement counts: Family and community partnerships and mathematics achievement. *The Journal of Educational Research*, *Vol.98*(4), 196-206.

Smith, T. J. (2003, September). Pedagogy as conversation: A metaphor for learning together. *Mathematics Association of Victoria Annual Conference.* Melbourne: Monash University.

Solomon, Y., Warin, J., & Lewis, C. (2002). Helping with homework? Homework as a site of tension for parents and teenagers. *British Educational Research Journal*, *Vol.28*(4), 603-622.

Street, B., Baker, D., & Tomlin, A. (2008). *Navigating Numeracies: home/school numeracy practices.* UK: Springer Science.

Swanson, D. M. (2005). Schooled mathematics: discourse and the politics of context. In A. Chronaki, & I. M. Christiansen, *Challenging Perspectives on Mathematics Classroom Communication* (pp. 261-294). US: Information Age Publishing.

Warton, P. M. (2001). The Forgotten Voices in Homework: Views of Students. *Educational Psychologist*, *Vol.36*(3), 155-165.

Zittoun, T. (2008). Learning through transitions: the role of instutions. *European Journal of Psychology of Education*, *Vol.23*(2), 165-181.