

I ACTUALLY STARTED TO SCREAM: DOING SCHOOL MATHEMATICS HOMEWORK

Troels Lange and Tamsin Meaney

Charles Sturt University, Wagga Wagga

Homework is an activity done by large numbers of students all over the world. Many concerns have been raised including, especially in primary schools, whether any academic benefit is gained and whether parents have appropriate resources to actively support/teach their children. In this paper, we explore the stories that two ten year old girls tell about doing their mathematics homework with family help and the pressures that it puts on them to take control of their own learning. We discuss the opportunities and constraints to students doing homework as a consequence of the social and institutional relations that they operate within.

HOMEWORK AS TRAUMA

Although mathematics homework is done by students all over the world, it is not without controversy. As well as showing limited effects on primary students' academic performances (Inglis, 2005), homework can be the source of great trauma. Recently, an Egyptian mathematics teacher was convicted of the manslaughter of an 11 year old boy after disciplining him for not completing his homework (<http://www.abc.net.au/news/stories/2008/12/26/2455355.htm>). This level of physical violence is rare, but homework is often a source of frustration for many families (Kralovec & Buell, 2000). In this paper, we contend that homework can be emotionally traumatic, especially for children who are in difficulties with mathematics. We use the stories told by two children to explore the impact of homework on their lives and the opportunities and constraints for reducing the trauma associated with it.

Using a socio-cultural framework, Street, Baker and Tomlin (2008) described homework as an example of school numeracy practices that is done in the home domain. There is an expectation that parents or care givers have, at the very least, a monitoring role, but the interplay of children, parents and teachers' expectations about homework is not a simple one. Street, et al. (2008) also described how teachers often expressed disappointment with the support that they believed the parents were providing. However, teachers can have an inaccurate view of what was actually being provided (Lange, 2008a; Street, et al., 2008).

Nevertheless, parents who had bad experiences of doing school mathematics themselves may not have the confidence or requisite knowledge to provide help (Anthony and Walshaw, 2007). Many immigrant parents struggle with seeing what the school set as homework as being appropriate mathematics and with knowing how

to provide support to their children (Abreu & Cline, 2005; Bratton, Civil, & Quintos, 2005; Hawighorst, 2005).

When parents' expectations differed to those of the school, often the children were the ones who had to determine an approach that resolved the differences (Street, et al., 2008). For example, in Abreu and Cline's (2005) study, some students expressed a devaluing of their parents' support as their methods of doing mathematics were different to those of the school. For other students, often the only option when the frustration level from working with their parents became too great was to resist. This could raise the ire both of teachers and parents. Homework thus has the potential to be traumatic.

There has been little research into students' perceptions of doing mathematics homework, but what has been done suggests that students who are in difficulties with mathematics are the ones who are most likely to suffer frustration. Street et al. (2008) describe how one parent reported that her daughter who was a low achiever in mathematics had requested that her mother stopped trying to help. Abreu and Cline (2005) quoted a parent of another low achieving student who stated that when she tried to help her daughter "she'd get frustrated and I'd get frustrated, we'd ... just get ... at loggerheads" (p. 714). High achievers seemed more able to explain the school methods of doing mathematics so that parents were able to understand the differences in approaches. This did not seem to be a possibility for low achieving students.

Given that "homework also is exertion of teacher power over students, a way of controlling students' behaviour in and out of school time, and a way of asserting school norms and values" (Lange, 2008a), the possibilities for disputes and emotional trauma is great. Children are the ones who are most likely to suffer from this trauma and also the ones who often sort out how to deal with the different pressures. In this paper, we investigate the experiences of doing homework of two girls, who both had difficulties with mathematics. We focus on the features of the situations that hinder or facilitate the likelihood of trauma when doing homework.

METHODOLOGY AND THEORETICAL FRAMEWORK

The interview data in this paper comes from a larger study exploring children's perceptions about their mathematics education. Hence, the interviews were semi-structured life world interviews, i.e. interviews that "seek to obtain descriptions of the interviewees' lived world with respect to interpretation of the meaning of the described phenomena" (Kvale & Brinkmann, 2009, p. 27), in this case mathematics education. Children aged 10-11 years in a Danish Year 4 class were interviewed (Lange, 2008b). The extracts come from an interview with two girls that covered a number of topics. They are analysed using Street et al.'s (2008) *ideological model of numeracy*. Table 1 describes the four inter-related dimensions of the model. We concentrate on how clashes between home and school in relationship to values/beliefs and social/institutional relations arise and then are resolved.

Dimensions	Description
Content	The mathematical concepts, such as times tables.
Context	The situation in which a numeracy practice takes place.
Values and Beliefs	The participants' beliefs about how numeracy practices should progress and how new skills and knowledge are taught within them.
Social and Institutional Relations	The overarching factors that channel what are seen as appropriate choices in the other three dimensions.

Table 1: Dimensions from the ideological model of numeracy (Street et al., 2005)

The children's narratives were rarely rounded, monologic stories. Usually they unfolded as dialogues involving active listening and questions (Kvale & Brinkmann, 2009). Consequently, we have included a long transcript with the original Danish and an English translation. They have been tidied a little to make them easier to read. Line numbers indicate where these extracts came from in the interview.

INTERVIEW EXTRACTS

Isabella's homework experience

The first extract begins discussion on homework in the interview. In it, Isabella describes learning her six times tables with her mother. It does not seem to be stressful for Isabella and may even have been an enjoyable time with her mother.

244	Isabella	Nogle gange når jeg skal også lave lektier, for eksempel hvis vi nu har fået sekstabellen for, ik å, så laver min mor sådan for eksempel hun skriver seks gange en og så seks gange to. Så vender hun dem alle sammen om og så drejer hun dem rundt og så skal jeg så tage en op og så skal jeg så sige det og så tager hun dem alle sammen i en bunke til sidst og så viser dem og så skal jeg sige dem, så til når jeg kan dem. Så stopper vi.	Some times when I do my homework, for example if we have been set the six times table then my mother, like for example, she writes six times one and then six times two [on pieces of paper]. Then she turns all of them over and then she turns them around and then I must pick one up and then I must say it and then she takes all of them together in a pile at last and then show them and then I must say them then until when I know them. Then we stop
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The following provides a description using Street et al., four dimensions.

Content: This was times tables and in particular the six times table.

Context: The practice of times tables was done at home, but so that mastery of them could be displayed at school. From other interviews (see Lange, 2008b), the children

told about being tested at school on times tables learnt at home. The teacher would then record each child's achievement with ticks on a chart.

Values and Beliefs: Knowing times tables was important at both home and school and this can be seen through the teacher's recording of achievement and through the time that Isabella and her mother spent on learning them at home. Learning of times tables was through memorisation, not understanding of for instance number relations. The method for learning times tables at home resembled the testing done at school, except that Isabella had the opportunity to redo any incorrect ones till she had correctly memorised them all. She could take as long as she needed and there were no consequences if she got one wrong, except that it would be returned to the pile. This would most likely be different to how times tables were done in the school setting where the teacher would not have the time to allow the child to keep repeating the questions until they were all correct. Therefore, although the approaches at home and school were similar, the way that interactions occurred between the child and the adult were different and worked to the advantage of the child at home.

Social and Institutional Relations: In other research, learning of times tables was considered important by many parents (Street et al., 2008; Abreu & Cline, 2005) as it had been heavily stressed in the parents' own schooling. Isabella's mother's also seemed to hold this view as she provided support for her daughter's learning of them. The relations between home and school are strengthened through the shared understanding and support for the learning of times tables knowledge.

Maria's homework experience

The next extract shows that Maria's experiences of receiving family support was traumatic. It is a longer extract as Maria described what happened and how she resolved the issue by requesting that her parents no longer help her, even though she knew that she struggled with doing mathematics.

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| 247 Maria | Det var fordi engang da var mine forældre sådan at de gerne ville hjælpe mig. Hele tiden. Jeg synes bare det var alt for meget. De ville hjælpe mig med matematikken fordi jeg ikke var særlig god til det. (T: ok) Og så endte det så med til sidst at min far fordi jeg blev sådan, jeg begyndte faktisk at skribe. (T: ok) Og det skete næsten hver gang og så begyndte jeg at græde og så rendte jeg ind på mit værelse. Og det var sådan det var. Men nu, nu gør jeg det jo ikke mere. Nu laver jeg dem bare selv fordi nu kan jeg | It was because once then my parents was so that they wanted to help me. All the time. I just thought it was far too much. They wanted to help me with maths because I was not particularly good at it. (T: ok) And then it ended with at last that my dad because I got like, I actually started to scream (T: ok). And that happened almost every time and then I started to cry and then I ran into my room. And that was how it was. But now, now I don't do that any |
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- godt finde ud af det. ... more, you see. Now I just do them [the sums] myself because now I can work it out ...
- 251 Troels Ja. Kan du fortælle lidt mere om det? Hvordan var det? Yes. Could you tell a little more about it. How was it?
- 252 Maria Mm. Det var jo ikke rart fordi at – Og så bagefter så kom min mor ind og så. ”Ahm, ok” sagde hun ”vi skal nok prøve at lade være”. Så skete det så igen, hvor jeg så begyndte at græde. Så satte jeg mig i en stol og så sad jeg der i vores stol. Så sad jeg bare _ Det var helt vildt. Og så _ ind på mit værelse. Og så smækkede med døren. Og så blev min mor sur for det gider hun ikke have jeg gør. ... Mm. It was not pleasant, you see, because – And then afterwards then my mum came in and then “Ahm, ok” she said “we will try not to do it”. Then it happened again where I then started to cry. Then I sat down in a chair and then I sat there in our chair. Then I just sat _. It was crazy. And then _ [I went/ran] to my room. And then slammed the door. And then my mum got cross because she won’t have me doing that ...
- 257 Troels Hvordan fandt du ud af at du ikke var så god til matematik? How did you realise that you were not so good at mathematics?
- 258 Maria Jeg synes, jeg følte det sådan helt, det kunne jeg altså bare ikke overskue, så jeg havde bare lyst til at smide hele ud. (T: ja) Jeg havde bare lyst til at bare gøre sådan “Nej nu smider jeg matematikken væk. Nu vil jeg slet ikke have det mere” (T: nej) Jeg synes det er dumt / I think, I felt it like completely, I just could not cope with it [or: take it in] so I just felt like throwing all of it out (T: yes). I just felt like doing so “No now I throw maths away. Now I will not at all have it more” (T: no). I think it is stupid /
- 259 Isabella Nogle gange hvis der kommer sådan nogle problemer så har jeg bare lyst til sådan smide, væk med det. Alt. Og så sætte sig i stolen og så bare sidde og slappe af Sometimes if such problems come then I just feel like, like throwing, away with it. All of it. And then sit down in the chair and just sit and relax
- 260 Troels Ja, ja Yes, yes
- 261 Maria Men det kunne man jo ikke og så derfor så begyndte jeg at blive ked af det. Og min far: ”Og så skal du jo gøre sådan. Og hvad er det? (T: mm) HVAD ER DET?” (T: mm) But you could not do that, you see, and then therefore I started getting upset. And my dad: “And then you must do so. And what is that? (T: mm) WHAT

- Og så hvis man ikke kunne finde ud af det så, så (sagde han) sådan her ”Du skal ikke tælle på fingre. Hvad er det? (stemmeføring der antyder at M er dum)” (T: ja) Yyh hh ...
- IS THAT?” (T: mm) And then if you could not work it out then, then (he said) like this: “You must not count on fingers. What is that?” [in a voice that suggests that M is stupid] (T: yes) Eeehhh ...
- 264 Troels Men hvordan gik det så over? ... But how did it go away? ...
- 267 Maria Nej, ok det var sidste år det begyndte at stoppe fordi nu lod de mig være med det for jeg har sagt til min mor “Mor jeg synes altså ikke at - I behøves altså ikke at hjælpe mig så meget.” (T: ok) Så fandt jeg så ud af det selv og det var rigtig svært og jeg kæmpede helt vildt hårdt for det (uf)
- No, ok it was last year that it started to stop because now they let me alone with it because I have said to my mum “Mum I really don’t think that – you really need not help me that much.” (T: ok) Then I worked it out myself and it was really difficult and I fought for it really very hard
- 268 Troels Hvordan kæmpede du? How did you fight?
- 269 Maria 22:56 Altså jeg sad timer med det der matematik. Så sad jeg bare der. (T: mm) Så fik jeg så skrevet tallene ned (T: ja). Skrevet tallene ned (T: ja I: ja) – Nu kan jeg godt.
- I sat for hours with that maths, you see. I just sat there. (T: mm) Then I got the numbers written down (T: yes) The numbers written down (T: yes I: yes) – Now I can

Street al.’s (2008) four dimensions shows significant differences between Maria’s and Isabella’s experiences.

Content: Maria was working on sums and in particular was finding effective ways to determine the answers. In other parts of the interview, she described subtraction as being the part of mathematics with which she had the most difficulty.

Context: Like Isabella, homework was initially done with family help. Maria described her parents as wanting to help her because she was not good at mathematics. Her parents made several (unsuccessful) attempts at trying to help her.

Values and Beliefs: In this extract, there was a mismatch between how Maria and her father felt the sums should be worked out. Maria’s father did not value using fingers. Although Maria was aware there were other methods, she did not seem confident in using them until she knew how they worked. The learning required more than memorisation. It seemed that her father did not have the skills to explain the method that he wanted her to use.

Social and Institutional Relations: The relations between Maria and her parents seemed to survive the trauma of doing mathematics homework, in the same way that Maria's relationship with mathematics seems to have continued. It could be that because Maria believed that these relationships had to continue that she forced herself to understand the mathematics. Both she and Isabella expressed a wish to throw mathematics away when the problems became too hard. However, her need to find a way forward that did not include help from her parents meant that she persevered. The social relations at home were different to those at school. Maria's reaction to her family's help of screaming and slamming the door may not have been acceptable at home but was tolerated. It is unlikely that Maria would have exhibited the same behaviour at school when she was unable to do the mathematics (see Lange, 2008b). Therefore, in the home environment she can act out her frustration and also request that her parents not help her any further. At school, it is not acceptable for a child to refuse the help of a teacher, yet at home the different type of social relations provides Maria with an opportunity to find her own solution for overcoming the difficulties she was experiencing.

OPPORTUNITIES AND CONSTRAINTS

If mathematics is to be done as homework, there is potential for students to experience trauma, especially if they are in difficulties with mathematics. This trauma arises when students are unable to do the homework and is compounded when the support that the parents provide is in conflict with what the child has learnt at school or beyond what the child is capable of doing. However, as well as placing constraints on the way that help is provided because of the parents' own understandings about mathematics, doing mathematics at home also offers opportunities that are not available in school.

Isabella's story suggested that when her mother's beliefs about valuable mathematics and the ways that it should be learnt at home matched those of the school then Isabella was not pulled between two different approaches. Learning through memorisation has less potential for differences of approach than when the learning requires understanding. Isabella may still experience trauma if she was unable to be successful in doing the mathematics and this can be seen in the second extract where she talks about throwing mathematics away. However, this would be a different kind of trauma than if she had to navigate a path between her parents and her school.

Maria's experience was different as in order to do the sums she needed to understand the method she was to use. When the method that she adopted was not the one expected by her father, Maria experienced great distress. Not only could she not do the maths but her interactions with her father contributed to her feelings of being inadequate. However, again the way that social relations operated at home provided opportunities to find her own solution that were not possible in school. She could reject her parents help but only if she persevered with finding a solution. If she had not been able to find a solution then the result may not have been successful.

Doing mathematics homework can be traumatic. For some children, there is significant pressure to successfully determine their own solution to doing the mathematics, so that they can negotiate a pathway between home and school expectations about what this entails. If these children are unable to find a solution, then homework will continue to be a conflict zone at home and at school where there are likely to be consequences for not completing the homework.

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