

## **A gender perspective on adults' motivation (and resistance) to learn mathematics**

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***Abstract.** In the English research project “Making numeracy teaching meaningful to adult learners”, a central research question was about students’ motivations for learning mathematics. From this project, we have access to rich empirical data from semi-structured interviews with the students (2/3 female and 1/3 male). One of the key findings was that students’ motivations are varied and complex but few come to study maths because they feel a lack of skills in their everyday lives. In this paper, the author revisits these data in order to bring gender perspectives into the students’ motivation and resistance to study mathematics. Four analytical gender perspectives (structural, symbolic, personal, and interactional) are presented and used in the analysis, which is based on an understanding of adults’ motivation and resistance to learn as two interrelated phenomena.*

At the beginning of the 21<sup>st</sup> century, the principle of lifelong learning structures the educational systems in the Western countries. Thus, the rights and the obligations concerning education do not stop with childhood and youth but also include adult life. However, continuing education is experienced by adults as a field of tension between needs and constraints. In our ongoing work, we (Evans and Wedege, 2004, Wedege and Evans, 2006) try to take this into account when we discuss people’s motivation and resistance to learning mathematics, as interrelated phenomena, and we argue that motivation and resistance, should be seen as social – and not merely individual – phenomena. The two phenomena relate to the affective dimension of the adults’ learning process and they link to the question: Why am I (not) learning mathematics?

The main focus of this paper being gender, I shall not go deeper into our conception of motivation and resistance. The principal thing in this context is the idea of motivation as a social phenomenon, which we also find in a research project at the National Research and Development Centre for adult literacy and numeracy (NRDC), London.

### **A research project on adults’ motivation**

In the project *Making numeracy teaching meaningful to adult learners*, a central research questions was about students’ motivations for attending – and continuing in – adult numeracy classes (Swain et al., 2005). During 2002-2004, the NRDC project investigated four English adult numeracy classes, three day classes and one evening class, with 80 students in total, who were working between entry level 1 and level 2. The two main methods of data collection were semi-participant observation within the classroom and loosely structured interviews with students. The average age of the students was 37 (ranging between 17 and 64 years) and the gender composition was 2/3

female and 1/3 male. From this project, we have access to empirical data from 60 interviews with the students.

### Findings on motivation (Swain et al., 2005)

Students' motivations for joining, and continuing to attend, numeracy classes are varied and complex. However, few of these are related to perceived needs within their current employment, or to students feeling that they have a skills deficit in their everyday life. And only a few students were attending classes in order to gain a qualification. In the summary of the key findings (p. 86), it is stated that "The main triggers are: to prove that they can succeed in a subject where they have previously experienced failure; to help their children; for understanding, engagement and enjoyment; and to get a qualification for further study."

In the NRDC project, "Motivations" is similar to "Reasons" though reasons are regarded as being more straightforward and on the surface, and motivations as deeper and underlying (p. 43). In Appendix I to the report, Swain (2005) presents three headings for grouping students' motivations, or reasons, for attending, and continuing to attend, numeracy classes:

1. *utility* (e.g. to help function in everyday life; to get a qualification; to help my children)
2. *understanding* (e.g. to help understand the world; to be mentally challenged and engage with mathematic.)
3. *for self* (e.g. for me, just for me; for self esteem; to gain confidence)

Seen through the lenses of this framework, the main motivations expressed by adult students in the study were:

- to prove that they have the ability to succeed in a subject which they see as being a signifier of intelligence;
- to help their children; and
- for understanding, engagement and enjoyment.

Gender was not included as an analytical dimension in the NRDC study, although previous work in adult mathematics education suggests that it would be relevant.

### **Four analytical perspectives on gender**

In order to bring gender into the adults' motivation and resistance to learn mathematics, I have revisited the NRDC data using four analytical perspectives developed by Bjerrum Nielsen (2003): structural, symbolic, personal, and interactional gender. In the presentation of the four perspectives, I use examples from Kirsten Grøn­bæk Hansen's research in the Danish technical schools in the late 1980s (Hansen, 1991, 2000; see also Wedege, 2007), which also might illustrate the situation in mathematics classrooms in a period where many of the students in the NRDC project went to school and had their first experiences with learning – or not learning – mathematics.

### First perspective: *structural gender*

Gender constitutes a social structure where for example men and women are unevenly distributed in terms of education and occupations; men earn more than women, who furthermore hold fewer leading positions in society; women do more housework in most families. In the early 1990s, there was a clear division of gender in the Danish technical schools. The higher secondary level with technical mathematics and physics (called “TX”) and the vocations in metal and building industries were mainly chosen by boys while vocations like hairdresser and “sandwich maker” were primarily chosen by girls.

### Second perspective: *symbolic gender*

The gendered structures gradually form the gender symbols and discourses (symbolic meaning) in people’s heads. It becomes, for example, normal and natural that men take the leading positions in society while women have part-time jobs to take care of home and family. Gender also becomes a framework of interpretation. In the Danish technical schools, the world and its qualities were divided into masculine and feminine, and everybody had integrated this dualism whether they wanted to or not. Mathematics was seen as a masculine area of competence with its logic and precision and this symbolism became generally accepted by the students. The boys at optional mathematics classrooms did not speak about mathematics being difficult; they spoke about the bad teachers and said that they did not feel like working with it, that they would rather use their body. One of the consequences of this dualism was that teachers – despite their good intentions – might have used different standards for boys and girls.

Structural and symbolic gender are connected almost by definition:

... symbolic gender will have consequences for the further development of structural gender, and vice versa (Bjerrum Nielsen, 2003, p. 18).

Structural and symbolic gender tells us what is normal and what is deviant for men and women, girls and boys whether we personally consent to these norms or not.

### Third perspective: *personal gender*

Gender is seen as a personal matter and a reality for everybody. People are not passive bricks in social and cultural structures. They shape their lives within these structures, discourses and norms, and gender in the world is more diverse than the often dichotomous and stereotyping gender in our heads.

Personal gender concerns the way we fit into (or do not fit well into), identify with or protest against available cultural models of gender (Bjerrum Nielsen, 2003, p. 22).

Most of the students in Danish technical schools came from homes unfamiliar with education. The girls in the TX-classes were in a process of upward social mobility and they used the masculine field to help achieve this goal. By doing mathematics they could distinguish themselves from the other girls. The boys were vulnerable in their social climbing where they had to leave their old background for gendered identity (muscle power and technical ingenuity). Their gendered subjectivity was threatened because the masculine-feminine hierarchy made it difficult for the boys to move into the fields of the girls if they should wish to do so.

#### Fourth perspective: *interactional gender*

Gender is seen as something created and reproduced through social interaction (negotiation). When people interact they continuously negotiate who they are and who others are. This perspective emphasises gender as something we “do” whereas the personal perspective emphasises gender as something we “are”. Individuals position themselves and others as gendered, and they get feedback on these positions. In TX-classrooms, the girls did not have the same legitimate access to high status in the mathematics classroom as the boys. Although a girl was the best in mathematics in one of the classes, she was not accorded this status. Also the teachers found it difficult to recognize the girls’ competences. Good performance of a girl was often followed by a doubtful shake of the head: she was “certainly very hard-working” (see also Walkerdine, 1989).

### **Gender and motivation/resistance in the collection of data**

As mentioned above, gender was not a specific analytical dimension in the NRDC project. Nevertheless, one of the results on the students’ motivation to learn mathematics was related to gender. A major reason why people came to the numeracy classes was to help their children. Many students wanted to learn mathematics at college to be able to help their children with their schoolwork, but unlike in the other categories of motivations these were exclusively women (Swain et al., 2005). Also as mentioned it was found that only few of the students’ motivations for joining numeracy classes were related to perceived needs within their current employment or everyday life. This finding differs from the results in an Austrian quantitative study from the mid-1990s (Schlöglmann, 2006).

In Schlöglmann’s study, the 419 participants (80,5% men and 19,5% women) came from 19 courses at seven institutions within the Austrian adult education system. In all of the courses, mathematics was either explicitly or implicitly included. The extensive questionnaire contained among other things items on the adult students’ motivation. In this project, it was found that the frequencies were correlated with the type of adult education the participants were engaged in. Participants in basic programs – as in the NRDC project – cited “improvement of personal education” (74%), “increased vocational demands” (63%), “joy of learning new subjects” (60.5%) and “to cope with life problems” (49%) as their main motives for taking adult education courses. Schlöglmann (2006) notes however that in interviews, some of these participants cited their own physical condition and the necessity to prepare for a new job as their main reasons (many students were undertaking vocational training because they had to change jobs for health reasons); but this category did not appear in the questionnaire. Besides the different results this illustrates the influence of the data collection methods.

I have revisited the empirical data from NRDC asking if it is possible to use the four gender perspectives to analyze the adult students’ statements about motivation and resistance to study mathematics. However,

The study explored a particular and limited cohort of adult learners: these were students who attended discrete numeracy classes on a voluntary basis, who worked with very good teachers and were generally very well motivated (Swain et al., 2005, p. 8).

Moreover, the research interest in the NRDC project was the reasons for people to study mathematics (and what is good teaching practice) – not the reasons for not studying or learning mathematics. Thus, put simply, the data is focused mainly on motivation – not on resistance. Furthermore the participants are not representative of the population of people attending adult mathematics education because they are generally well motivated. On the other hand, the approach and the theoretical background in the project are compatible with our approach, at first sight.

In my first attempt to use the analytical framework on the data, I have chosen one of the three cases in the NRDC report: Monica. She attended the numeracy class in the two phases of the research and was interviewed on three occasions together with other students.

## Monica

Monica is in her late 30s. She joined the numeracy class at the middle of the entry level 2. She has also studied IT and Literacy and gained a level 1 qualification in English. Until recently, she was a housewife. Now she is a single parent of a son almost 16 years old. She is living next door to her close friend Clare, who is also a single parent, and who also attends the numeracy class. Monica has always been good with money – and as she puts it: “simple percentages were never a problem”. She has several reasons for attending the class (and continuing):

- to obtain a CGSE mathematics qualification
- to get a better job
- to prove to herself that she is worth something and to set a good example to her son.

In the quotations below from transcripts of two interviews with Monica and Clare (M\_1 and M\_17), I have used the same notation as in the NRDC project:

- [text] Background information;
- [...] extracts edited out of transcript for sake of clarity;
- ... pause.

“JS” in the transcript, stands for Jon Swain, who interviewed these students.

### Structural gender perspective

Gender constitutes a social structure, and men and women are, for example, unevenly distributed in terms of education. For Monica not having a high level of education has been a structural consequence of being a woman. As in many other families, girls were not educated in her family. They were brought up to fulfil traditional women’s roles:

M: But I was brought up in my family that girls weren’t important for education. Boys that grew up... the old fashioned thing of men out at work and women just bred. So I suppose I got married young and did the woman thing, rather than seeking education. (M\_1, l. 357-360)

Today, Monica and her friend Clare are single parents. In England – as in Scandinavia – the situation of being a single parent is closely connected with being a woman. Talking

about reasons for attending the course in the first interview, Clare talked about the new governmental demands that single parents have to go back to work or alternatively go into training. Monica decided to do training and she convinced her friend that it was a good idea.

In the second interview, the interviewer invited them to go through their main motivation for coming here again:

Clare: My original one [reason] is definitely because of the government saying I've got to do so many hours because my daughter is of the age that I should go out to work, and being as I wasn't qualified enough I didn't think I could go out and do it so easy. That was one of the reasons. (M\_17, l. 272-285)

### Structural & symbolic gender perspectives

The gendered structures gradually form symbolic meaning in people's heads. It becomes, for example, normal and natural that men take the leading positions in society while women have part time jobs to take care of home and family. In Monica's family, it was normal that girls were not educated and that is also why she has a special relationship with her brother. In the following examples it is not that easy to clarify gender, which is also intersectional with class. Hence it is necessary to compare with men – for example Monica's little brother – to see the differences.

During the first interview, they were talking about confidence and self-esteem in relation to mathematics:

M: I think we are human beings and in one subject or another you are always lacking in confidence. And I think with women, we tend to be our worst enemies in having a go at each other internally.

JS: Being self-critical. More than men? [...]

M: Very critical. I can only say from a woman's point of view. I think men do. I'm just learning that. I like watching me learn..... psychology..... (M\_1, l. 278-287)

### Personal & symbolic gender perspectives

Gender is also a personal matter and a reality for everybody. Men and women shape their lives within these structures, discourses and norms. Talking about good instruction and the role of the teacher in the second interview, the interviewer points to mathematics as a particular subject:

JS: [...] But do you think maths is a particular subject, that in a way it's a sign of intelligence? More than any other subject? [...]

M: I think that's an inferior complex of yourself when you start thinking that. Now I'm not so frightened of people with bigger paperwork than me. I've worked with people that are great with exams but can't learn to drive a car or pack a box in a.... [...] I see them as no different to you. They might know one subject better than you. That's all I see it as. But then I might know something they don't. [...] it's just believing in yourself, and I think going to college is one of the steps to prove to yourself that you are not stupid, not thick. (M\_17, l. 476-488)

## Personal gender perspective

The interviewer invited Monica to repeat what she had said earlier about the first time she came to college. She was really doing this for herself:

M: I'd convinced myself that I'd got to do something. It was a matter of like, things happening, I'd have to go into detail and you'd think I'm weird in the head, but ..... the first day I was at the college I stood there. And I thought - you are doing this girl. You are going to go through that door. And part of you is like - no..... [...] And how many years.....? I started to count.... over twenty odd years. (M\_1, l. 167-175)

## Interactional gender perspective

Finally, gender is something created and reproduced through social interaction or negotiation. When people interact they continuously negotiate who they are and who others are. This is thematized in the following sequence:

JS Yes. That's right. We all develop at a different rate at different types don't we? Just because you are not very good at school doesn't mean you are not intelligent. You could develop in later life and things, as an adult. [...]

M: This is what I say, my brother was very quick on the uptake with maths, English, the lot. And I remember him as a kid insulting me and I turned around and said - you may be good at English but I have one thing higher than what you've got. He said - what's that? Common sense, I said. And that doesn't come with a certificate (M\_1, l. 110-120)

Another illustration of the interactional gender perspective is to be found in the second interview where the question was: "Has it helped you with life outside the classroom? Are you sharper in certain ways?"

M: But then your attitude changes towards people as well, because as you educate yourself, or do something that builds confidence, you now don't allow anybody to treat you with disrespect. I mean, beforehand, because you think you are not good enough you would let somebody talk down to you. Now I would say - excuse me, what do you mean by that? Rather than walk away and feel hurt by whatever they said. And I think that is the difference. (M\_17, l. 372-377)

Gender is not mentioned in this passage; however I suggest that Monica's narrative is understood against the background of situation in her family and her relationship with her brother, which was unfolded in the previous interview.

## Structural, personal & interactional gender perspectives

The four perspectives on gender (structural, symbolic, personal, interactional) do not refer to different acts or situations. They are different analytical perspectives to be applied to the same activity or situation; and I shall finish the analysis by giving an example where the interplay of the perspectives is obvious.

One of the questions in the interview guide sounds like this: "Has there been a particular key moment or turning point in your learning of maths? – either something that turned you on or off (can be positive or negative)". In the first interview, Monica did not give

any answer but, in the second interview she pointed out the moment where her husband went off with another woman. She continues:

M: Doing the right thing, as they say. Good wife, put up and shut up. Whereas now I look back and I think, I can see their relationship. And he's just swapped one thing for another, and not moved on. Whereas I can see what I've done in the last three years, compared to what he's got now, and he hasn't moved or improved or... (M\_17, l. 580-586)

## Conclusion and perspectives

The analysis above shows that the framework of gender perspectives might be productive in locating gender in the data collected in the project "Making numeracy teaching meaningful to adult learners". The four perspectives (structural, symbolic, personal and interactional gender) create new meanings to Monica's narrative – as separate or inter-connected perspectives. Thus, we – Evans and Wedege – have plans to go on with the gender perspective and attempt to continue with the motivation/resistance issue and related affective issues as well, such as the students' views of themselves as learners of mathematics (See Wedege, 1999, 2002, and Evans, 2000). In the introduction, I stressed that we understand motivation as a social phenomenon, which they also do in the NRDC project. Their theoretical framework is based on the work of for example sociologist Pierre Bourdieu and anthropologist like Jean Lave (Swain, 2005 p. 31 ff) whom we have also used in our research (e.g. Wedege, 1999). This theoretical choice had consequences for the questions asked to the students, which in the case of Monica for example made it possible for her to talk about her childhood.

In our ongoing work, we have to further check and discuss if their problematique is compatible with ours – for example – if their concepts are theoretically compatibles with ours. In the NRDC project, as an example, no conceptual distinction is made between motivation to attend and motivation to learn (to continue to study) mathematics. I find it important to distinguish between the two theoretical and interrelated constructs: Why study mathematics (justification) and why learn mathematics (motivation).<sup>1</sup>

A specific issue in my research will be the role of mathematics in the psychological gender of adult learners. I will make an analytical distinction between two aspects of psychological gender suggested by Bjerrum Nielsen and Rudberg (1989): gendered identity (I am a woman/man hence I act like I do) versus gendered subjectivity (I am me hence I act like I do). The gendered identity is something you have while the gendered subjectivity is something you are. In their work it was hypothesised that gendered identity is a changing phenomenon while gendered subjectivity shows much more continuity, both historically and in the life of the individual.

My working hypothesis is that the importance of knowing mathematics is experienced differently by men and women; that the gendered identity of men in their mid-30s or older encompasses the belief: "I am a man hence I ought to like mathematics." Thus, embarrassment or shame of not knowing mathematics could be an example of a phenomenon especially related to male identity. One of the questions asked to the students in the NRDC project was as follows: "Do you think it's embarrassing to admit you are no good at maths? Is there a kind of shame (or stigma) attached to it?" (p. 57). I

have searched for “embarrass” in the transcripts and located the word in 19 interviews (14 female and 5 male). Half of the women answered yes to the question while 4/5 of the men said yes. Two of the women said no and two answered that it depends on the context. None of the men said no but one of them did not answer the question.<sup>ii</sup> In this very slender data material, I see a tendency, which can be examined by going deeper into the total data.

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<sup>i</sup> In her doctoral thesis entitled "Why teach mathematics to adults with lack of basic skills?", Johansen (2006) deals with the justification problem in relation to adult mathematics education from the perspective of the politicians, the educational planners and the teachers.

<sup>ii</sup> The phenomena of shame and embarrassment might underlie people's motivation and resistance to learn mathematics. Bibi (2002), who has studied shame as an emotional response to doing mathematics as an adult, suggests that the absolutist conceptions of mathematics provide ideal opportunities for experiencing shame.