BOREDOM IN MATHEMATICS CLASSROOMS FROM GERMANY, HONG KONG AND THE UNITED STATES

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Based on interviews with students from altogether six classrooms in Germany, Hong Kong and the United States, the paper explores students' elaborations of the notion of boredom in relation to their classroom context.

INTRODUCTION

When watching videos from altogether 60 lessons in the countries/ regions mentioned in the title, I observed in all classrooms at times some students sprawling on their desks or leaning back with their eyes half-closed, seemingly unlinked to the place and time of their experience, others heavily sighing, drumming their fingers on the desk, or playing around with their pens. Are these cross-cultural expressions of boredom?

BACKGROUND

There seem to be a range of more or less existential experiences in different cultures, summarised in English by the notion of boredom. In the languages relevant for this investigation, these have different connotations. The German *Langeweile* appears first in a dictionary from 1796 (Adelung, 1796), and is described as experiencing with listlessness a long (*lange*) "empty" while (*Weile*) when one is not busy with anything. The Online Etymology Dictionary ("Bore", 2012), which uses a range of etymological dictionaries as sources, finds the use of "bore" in the sense of "be tiresome or dull" in 1768. The word is traced back to the German *bohren* (to drill) and other variants in related languages, the meaning of "bored" being possibly a figurative extension of "to move forward slowly and persistently", as a boring tool does. According to Vadanovich et al. (2011), the Chinese phrases for boredom refer to "having nothing to do" and to "not being of interest".

Taken up by individual psychology, these experiences became classified as an emotion or mood (including elements of discomfort or even resentfulness). Paradoxically, various constructs describe the emotion of boredom as a lack of other emotions, as if emotions would fade away towards zero and then continue on the same dimension with negative values, e.g. as *lack of* interest and satisfaction (e.g. Smith, 1981; Bourgeois, 2001). Further, boredom has been essentialised as a trait called "boredom proneness" or "boredom susceptibility", for which scaled tests have been developed that are used for measuring students' or workers' dispositions for getting bored. Country differences in such measures have been found and elaborated by common sense cultural explanations, for example by Vodanovich et al. (2011). Autochthonous and philosophical terms for experiences summarised in English by the notion of boredom, here intermingle with moral or essentialist interpretations of behaviour. In a psychological study, focussing on an operational definition and its technicality, Sparfeldt et al. (2009) develop a mathematics-related "boredom-scale"

and relate their results to other mental states (intelligence, self-concept and interest) as well as to achievement, for all of which they find negative correlations with their scale amongst German students in grade four.

"Boredom", or whatever has been translated into this notion, is a category also frequently used by students and researchers in mathematics education internationally. For example, Brown et al. (2008) found that lack of enjoyment and perception of the subject as boring is amongst higher attaining students in the UK a common reason for not continuing with mathematics after it ceases to be compulsory at age 16. Amongst Norwegian first year upper secondary students (grade 9), Kislenko (2009) finds half of the students claiming that mathematics is boring, but also students stating that mathematics is interesting and boring at the same time. Measures of experiences of students' boredom have also been used in TIMSS. The students' questionnaire includes a question, where they can choose one out of four valences of agreement to the statement "Math(s) [in 1995]/ mathematics [in 1999 and 2007] is boring" (TIMSS context questionnaires, 1995, 1999, 2007). As to cultural differences, Li (2002) derives a model of the ideal Chinese student (a person with *Hao-Xue-Xin*, "heart and mind for wanting to learn") from interview data with high achieving college students, where the strategy to force themselves to persist when faced with boredom is an important feature of the "behavioral ideal". Li (p. 260) explains:

> Like any learners from any cultures, Chinese students too encounter the problem of boredom. Consistent with research findings on achievement motivation in the West … it is also no easy obstacle for Chinese students … a stronger measure is called for to counter the severe demotivating effect of uninteresting content: Force oneself to persist.

By basing this model on empirical data and a Chinese folk term, Li's construction shows how the projected image of a culture itself is a production of that culture.

Instead, the study reported here takes mathematics classrooms as "small cultures" (Holliday, 1999). This is to overcome the assumption of a hierarchical relation between a country's (or a group of countries') culture, and a school classroom's (or any other institutions') culture. Holliday sees the "onion-skin-relationship" model that sees small (sub)cultures as subordinate to and contained within large cultures, as a form of cultural essentialism, as it amounts to explaining differences in smaller units as stemming from the larger culture surrounding the inner layers. Activities in a mathematics classroom could as well amount to the production of cultures that cross the boarders of classrooms and countries. Consequently, it is of interest whether there is cohesion in relation to attributes of classroom practice. Students' motivations for engaging in mathematics for students from the same classrooms have been reported elsewhere (Jablonka, 2005). Here the focus is on the range of experiences linked to "boredom": *Is there any cohesion visible in the students' engagement and related feelings, expressed as "boredom", that is related to classroom micro-culture?*

Data

The investigation draws on student interviews from the Learner's Perspective Study (LPS) (e.g. Clarke et al., 2006), which were conducted in the form of video-stimulated recall interviews. The table below summarises some features of the selected classrooms. Some of the interviews were conducted with groups; hence the discrepancy between the number of interviews and interviewees. The selection of the two (out of three) classrooms videotaped in the LPS is based on maximising differences between classrooms from the same country in terms of student achievement. The rationale for selection of the classrooms in the LPS was based on selecting experienced and competent teachers according to local criteria.

Class	Achievement	Cultural composition	Students interviewed	Number of interviews	Class Size
G1	Average-high	Homogen.	22	11	27
G3	Low-average	Heterogen.	10	8	12
HK1	High- average	Homogen.	19	19	35
HK3	High	Homogen.	18	18	39
US1	Low	Heterogen.	20	20	29
US2	High	Heterogen.	20	20	33
			109	**96**	

Table 1: Features of the classes and number of students interviewed

Although the interviews had as their main goal to elicit students' interpretations of classroom events, a number of issues emerged that centred around students' feelings. In addition, all interviews contained an explicit question about whether they liked mathematics (lessons), but the notion of "boredom" was not used by the researchers. In the interview transcripts, all episodes where students talk about feelings and use the notion of "boredom" were identified. Names used in this paper are pseudonyms.

OUTCOMES

In total, 30 students explicitly used the notion of boredom, both, "positively", in saying the mathematics lessons were not boring, or for describing experiences of boredom in the lessons video-taped in the study, or in mathematics lessons in general. The summaries and quotes below display a wide range of experiences.

Germany, G1:

Five students from this class talk about boredom in the interviews.

Gabriel compares mathematics lessons with their current history lessons and states that mathematics is less boring, which he links to the subject and the teacher. Similarly, Stefan states that there are worse subjects, which are more boring. His favourite subject is arts.

Martin in general likes mathematics and links boredom to review, and to a lack of challenge in general; he names some high achieving classmates who are also likely to experience boredom:

> Martin: Well for Philip here...it's also boring sometimes...because he's generally very good in school...in all the subjects...yeah and for Lisa...she's also very good in school.

Albert likes mathematics, but says that it sometimes becomes boring and then he does not pay attention. He explains:

> Albert: Only when the questions you've already done a month earlier and are still being repeated all the time; that's really boring then, when you can already do them perfectly ... and - and it's fun, when there's something new.

Fred is generally not fond of mathematics, stating he likes other school subjects if he gets good marks; he names specific activities that he finds boring:

> Fred: Sometimes it is a bit boring a bit ... as a matter of fact, so, with all that numbers, if you then solve only algebraic terms for the whole lesson, well then you are not very keen on it anymore for the next lesson.

As less boring he mentions geometry and context problems.

Germany, G3:

From this class, four students use the notion of boredom in the interviews.

Jeannine says she generally likes mathematics and links her experience of boredom to the specific topic of percentages. She expands:

> Jeannine: Erm, yes then there are simply some people for whom the lessons are too boring. Well, I find the lessons quite boring myself sometimes. Well, if you did not at least have something to gabble about, so if I would not gabble now, I believe, I would always fall asleep.

Later in the interview, she also says that gabbling leads to not listening, which in turn leads to not understanding, which leads to boredom. She also says that experiencing boredom is partly related to the teacher.

Mona says she actually likes mathematics when she feels she understands. She gets bored if she feels she does not grasp a method:

> Mona: Don't know, somehow I didn't get anything at all, whatever I said was wrong, and then I got bored. Okay, if I understand something then I actually like it. […] I was bored because I didn't get it, and then I automatically switched off.

Later she explains why school in general can be fun:

> Mona: Sometimes it is fun, well if there wasn't any school we all wouldn't have met, after all, this is how you should look at it.

Jasara, when asked whether she likes mathematics, says laughing, “it’s a bit tricky”. She talks about being bored during the lesson and explains how her lack of engagement was linked to an upcoming test in another subject:

Jasara: I was only bored. […] Then I preferred to write and doodle. Actually, I, we had an English test after the lesson well now. Sat an English test and I mean, if Math had been added I think I would have muffed the English test.

Peer does not really dislike mathematics; for him the subject is “mediocre, yes it is not really my favourite subject”. He elaborates:

Peer: Yes, that wasn’t boring because Selin sat next to me ... this was a little bit funny but now during the lessons mostly because somehow I am on my own now (...) […] And don’t get anything Mrs. Md. is doing at the front on the blackboard, then it is going to be boring.

Hong Kong, HK1

Eight students in the interviews refer to what has been translated into the English terms ‘boredom’, ‘boring’ or ‘bored’.

Polly, like two students from G1, says she likes mathematics and compares mathematics lessons with other subjects:

Polly: No. It is just mathematics lessons uh- no, because in other lessons such as Chinese and Chinese history I do not need to use the brain, no, only listening to Miss talking- so it is boring. […] But I can think in mathematics lessons, so it is not- no, so it is not boring.

Michael talks about the choice of the social base for the communication and the hierarchy between teacher and students, and explains:

Michael: This is because we have to sit in this kind of environment- this particular environment is very boring. Although I am interested in mathematics, I will not like this every- every day.

Int: What do you think it should be?

Michael: I don't know, more freedom. […] If you sit where you like, you will be more interested to have the lesson. […] I think that this is better because there is a gap between the teacher and us. With a gap, we cannot ask so happily- cannot ask so easily. Asking our classmates can be very natural and easy and learn- I think we can learn faster

Nina states she cannot say whether she has positive or negative feelings in relation to mathematics. Then she compares the lesson they have just had with other lessons, saying that she “quite liked it” because it was not boring, while there are some other more boring lessons.

Osbert says whether he likes mathematics depends on the topic, indicating that he enjoys things that are “difficult” less. He likes equations, but did not like cosine. Osbert compares mathematics lessons in general with other lessons:

Osbert: Mathematics lesson… It's not as boring as other lessons […] He teaches us something. For the other lessons, the teachers talk about…the texts. But he teaches us, math. […] He teaches us what to do and we're thinking at the same time. We merely listen in other lessons.

Similarly, Paul compares mathematics with Chinese or Chinese history lessons, and mentions humour as a reason for engagement:

Paul: It's more interesting. It's not as boring as Chinese, which requires you to memorize things. Mr. Ng. will say something funny. In Chinese History lessons, the teacher only talks about the facts and asks you to do homework, but Mr. Ng will not. He draws the graphs with us and tells us some jokes.

Even though Patrick is not very fond of the current topic and finds the "graphical method [for solving a system of linear equations] troublesome", he states:

Patrick: Why do I like having math lessons? It's not so boring…you can use your brains, and…talk a little, because he allows you to have discussions at least.

Ruth mentions a lack of variation in lesson structure, and also states that releasing the seriousness could foster engagement. Further, she talks about a "sense of achievement" as important for enjoying a subject.

Ruth: Feeling? Mm… We must listen to the teacher, or we won't understand. And…it was a bit boring. He teaches in the same way every day. I think…we would be happier if he [the teacher] is not so stern.

Asked whether she likes mathematics, she says:

Ruth: Do I like mathematics? Mathematics…I like the arts subjects better, like Chinese. I'm good at arts subjects… when I was small they gave me…a sense of achievement, which couldn't be obtained from mathematics.

Rose generally does not dislike mathematics lessons, but states that they can be boring sometimes:

Rose: Yes. Sometimes, I find it's boring to solve problems again and again.

Further, she states preferences for some topics over others. She likes "drawing graphs", but finds (algebraic) calculations "confusing".

Hong Kong, HK3

In the interviews with students from this class, seven students explicitly refer to what has been translated into boredom.

Janet likes the lessons, and in comparing them with the ones they had earlier she finds them "less boring". She links this experience to the atmosphere and says she likes that it is more "crowded" and also states:

Janet: It seems to have more freedom in this lesson.

Jane also refers to the environment and says:

Jane: Okay, too quiet is not good, it will be boring if it is too quiet.

Further, she appreciates that there is some space for relaxing between phases of work:

> Jane: I can daydream when he is teaching us. So I work on the questions when we have to, can't daydream while working on the questions.

Gordon gives as a reason for enjoying the mathematic lesson they just had that he "did not feel bored".

Jessica says she does generally not like mathematics very much and refers to a sense of repetitiveness:

> Jessica: A bit boring, just keep on doing exercises. I don't really like it very much, nothing but just keep calculating and calculating, just calculating.

Joyce likes mathematics, as she moved from a feeling of difficulty to a feeling of being at ease with it. She compares the lessons with those she had earlier, in saying:

> Joyce: The teacher teaches quite well, he is better than the last one, who just did the problems on his own [...] after finishing doing it, was teaching a couple of questions, then asking us to do the exercises, after that he jumped to the next chapter. Very boring.

June says she does not very much like mathematics as she got low scores in primary school, which made her "a bit afraid of it." Yet she "quite" enjoys the lessons, but also says, "It's boring sometimes".

James, when asked whether he likes mathematics, states it is "just average", but there are not any aspects he dislikes. He also compares mathematics with other subjects:

> James: Mathematics is just fifty-fifty, but not very boring, because you can have something to do, because in IS [Integrated Science] lessons, we don't even have to make a move, just keep watching the teacher just…

United States, US1

There are two students from this class who elaborate on boredom.

Esperanza likes mathematics, but sometimes, she says, she gets bored, and then she is "day dreaming". This she links to a lack of competitive atmosphere, as it happens "when they don't have a quiz". The quizzes she appreciates because she likes to have good grades. She also compares mathematics with other subjects (science and history), which she does not like, stating that she does not like to "read".

Fred says that mathematics used to be his favourite subject, but, "It's gotten a little bit harder, over- over the years". Now he just wants to learn, while being less excited about it. Seeing himself in the video, he says:

> Fred: [laughs] It was too boring. I'm sitting- I was sitting there, trying to keep myself awake, (oh my lord) I'm sitting there [pretends to sleep]/

He links this experience to the fact that the lesson was about reviewing a test. He elaborates on a strategy of reduced attentiveness:

> Fred: Because I was paying attention enough to get the facts, but I wasn't exactly paying attention, if you know what I mean.

United States, US2

In the interviews with students from this class, four mention boredom.

Shannon does not explicitly dislike mathematics, but she talks about her preference for the "old" class she has been in, where she never felt "bored". She associates boredom with "having nothing to do". By this she refers to phases after having finished group work tasks earlier than other groups:

> Shannon: Alright, now I think it's ... I'm thinking it's kind of this, kind of boring. And so I- I just ... have nothing to do so I'm just kinda sitting there.

Brenda talks about her preference for "hands-on things", which she enjoys and which help her learning through making her engaged:

> Brenda: It helps me learn a lot. Like, when I actually- like with the lesson when we were measuring things, that really helped me understand because it was hands-on, rather than reading from the textbook, which is really boring.

Amy says she does enjoy mathematics, but not very much and not always. Of the things she finds boring, she does not think she dislikes them at the same time. She likes "graphing things", but neither fractions nor equations, and adds:

> Amy: I mean I'm- it's not like I don't like it, I just think it's kind of boring. So it's not like, oh I hate math, I just real- kind of boring.

Angie never really liked mathematics because, "it's usually hard for me". But she enjoys when she gets engaged, which for her is related to having conversations:

> Angie: At the same time while we're doing work, we can actually talk about stuff that happened in the day and stuff like that. […] Um, it just gets me more involved in it. I mean like when I'm bored and I don't even really want to be doing something, then it's like, oh okay, I'm just going to do this.

She links her general engagement to her daily mood, but also compares mathematics with other subjects, which she likes more (history, computer applications):

> Angie: Like if I'm tired and I'm not really in the mood for anything, I don't want- like any classes, but if I'm in a good mood, I like every class.

DISCUSSION

The experiences reported by the students cover a wide range of elaborations on feelings related to classroom practice. A few named specific "troublesome" or "confusing" topics they find boring, (Fred G1, Jeannine G3, Patrick HK1, Rose HK1). In contrast, Osbert (HK1) finds "difficult" topics less boring. Boredom is also elaborated as the feeling of already knowing a topic (Martin G1, Albert G1, Fred US1), but also related to "not getting it" (Jeannine G3, Mona G3, Per G3). Ruth (HK1) elaborates this by saying that she needs to experience "a sense of achievement". Jasara (G3) explains her deliberate choice for non-attentiveness. A couple of students see the lessons less boring in relation to other subjects, as they "use the brain" or "think", in contrast to just listening (Polly HK1, Osbert HK1, James HK3). Some expand on their lack of feeling to have control over the

communication, or on the possibilities for talking to each other (Michael HK1, Joyce HK3, Angie US2). Other atmospheric dimensions that are appreciated as help in overcoming boredom, include background noise and a "crowded" environment, as well as the releasing effect of jokes and humour (Paul HK1, Ruth HK1). While Jane (HK3) appreciates having time for "day dreaming", Shannon (US2) finds idle time boring. A sense of monotony and repetitiveness was also mentioned as causing boredom (Ruth HK1, Rose HK1, Jessica HK3). Brenda (US2) appreciates hands-on activity for overcoming boredom, and Esperanza (US1) competitive situations. Further, tiredness was mentioned by some in their elaborations of boredom.

Altogether, "boredom" was not a very common notion for describing their experiences, much less common indeed than reported in some of the studies cited above. This is perhaps due to the fact that here the students came up with the notion themselves, instead of answering a questionnaire where "boredom" is already included. Some of the experiences from the Hong Kong students can be interpreted as linked to lesson structure and social base of the communication in the classrooms, which appeared more varied in the other cases (as can be seen from the videos). Further, the notion of "thinking" or "using the brain" (as compared to only listening and learning by heart), was only mentioned by students from Hong Kong when they compared mathematics with other subjects. Other experiences might perhaps be related to the lower achievement of the students in Germany in G3 ("not getting it"). For the students from the German and US classrooms, the teaching practice in other subjects tends to be less boring (with the exception of one US1 student). Obviously, "hands-on activities" and other specific features of classroom practice can only be mentioned when they are used. From these observations it becomes clear that the students' perceptions of boredom in mathematics do not stand alone and have to be 'calibrated' against their general experiences at school as they talk about their experiences in other subjects and often associate boredom only with specific topics, activities or events. This challenges the use of the notion in international quantitative studies. Given the considerable variation of what is perceived as boring (or not) within each class, it seems to be disproportionate to link the students' experiences to a wider culture of learning habits, as for example claimed by Hess and Azuma (1991), or by Li (2002) cited above. The cultural essentialism implied in the "onion-skin-relationship" model of culture adopted in such explanations, in addition to the questionable labels used for describing the wider culture (such as "East" and "West"), renders such explanations largely unproductive.

Further, this little investigation is a reminder of the importance of including affective outcomes and emotional co-productions of mathematics learning as an important part of studying mathematics learning processes at school. The elaborations of boredom given by the students indeed suggest that framing the interpretation of cognition and emotion in social contexts is a fruitful endeavour and can help to overcome a view of emotions situated in isolated minds, through employing frameworks that recognise

that emotional experiences are situated, subconscious and embodied, as for example suggested by Drodge and Reid (2000) or Walshaw and Brown (2012).

REFERENCES

Bore (2012). In *The Online Etymology Dictionary*. Retrieved from the website of Harper 2001-2012 at: http://www.etymonline.com

Adelung, J. (1796). *Grammatikalisch-kritisches Woerterbuch*. Retrieved from the website of the Internet Archive – Community Books at: http://archive.org

Bourgeois, M. (2001). La souffrance et l'ennui. *Confrontations Psychiatriques, 42*, 123-136.

Brown, M., Brown, P., & Bibby, T. (2008). "I would rather die": reasons given by 16-year-olds for not continuing their study of mathematics, *Research in Mathematics Education, 10*(1), 3-18.

Clarke, D.J., Emanuelsson, J., Jablonka, E., & Mok, I.A.C. (Eds.). (2006). *Making Connections: Comparing Mathematics Classrooms Around the World*. Rotterdam, The Netherlands: Sense Publishers.

Drodge, E.N., & Reid, D.A. (2000). Embodied cognition and the mathematical emotional orientation. *Mathematical Thinking and Learning, 2*, 249–267.

Hess, R.D., & Azuma, H. (1991). Cultural support for schooling: Contrasts between Japan and the United States. *Educational Researcher, 20*(9), 2-12.

Holliday, A. (1999). Small cultures. *Applied Linguistics, 20*(2), 237-264.

Jablonka, E. (2005). Motivations and meanings of students' actions in six classrooms from Germany, Hong Kong and the United States. *ZDM, 37*(5), 371-378.

Kislenko, K. (2009). An investigation of Norwegian students' affective domain in mathematics. *NOMAD, Nord. Mat. Didakt., 14*(4), 33-64.

Li, J. (2002). A cultural model of learning: Chinese "Heart and Mind for Wanting to Learn". *Journal of Cross-Cultural Psychology, 33*(3), 248-269.

Smith, R.P. (1981). Boredom: A review. *Human Factors, 23*, 329-340.

Sparfeldt, J., Buch, S., Schwarz, F., Jachmann, J., & Rost, D. (2009). Rechnen ist langweilig - Langeweile in Mathematik bei Grundschülern. *Psychologie in Erziehung und Unterricht, 56*(1), 16-26.

TIMSS context questionnaires (1995, 1999, 2007). Available from TIMSS & PIRLS International Study Center, Boston College at http://timss.bc.edu

Vodanovich, S.J., Kass, S.J., Andrasik, F., Gerber, W.-D., Niederberger, U., & Breaux, C. (2011). Culture and gender differences in boredom proneness. *North American Journal of Psychology, 13*(2), 221-230.

Walshaw, M., & Brown, T. (2012). Affective productions of mathematical experience. *Educational Studies in Mathematics, 80*, 185–199.