

MATHEMATICS ANXIETY IN ACTION

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Anxiety is an unpleasant emotional state of fear. It is directed toward an unwanted possible future outcome, and is typically out of all proportion to the threat. Mathematics anxiety is anxiety in mathematical situations. It is related to general anxiety and its sub-constructs (e.g. test anxiety). (Hembree, 1990)

Experimental psychology has concluded that anxiety biases cognitive processing. Attention is biased towards threatening information, and judgments towards more threatening alternatives. There may be also memory bias towards threatening information. All this leads to impaired performance in cognitive tasks. (MacLeod, 1999)

I shall present a case study of one classroom interaction that illustrates the role of anxiety in the interaction between teacher and student. The student was an exceptionally well-behaved girl and rather quiet in the class. She was a diligent worker, yet she achieved below average in tests. For Helena, mathematics was characterized by strong negative emotions. She did not, however, express these emotions in the classroom. The severity of her negative affect became apparent first in an interview.

Helena: *Mathematics makes me at least so quite anxious ... and agonized and distressed. ... mood goes really down or you start ((to think)), depressed, that 'I don't understand this again'. Then just wait for the next exam horrified ... For me, that ((problem solving)) is exactly what makes me feel anxious, and then sort of, like, in a way, somewhat unpleasant feeling that sort of: 'Am I stupid or what - or feeble-minded?' - 'coz everyone else can solve this. So, why can't I?*

I shall present and analyze in detail a teaching interaction between Helena and her teacher. During one class, the teacher spent 15 minutes helping Helena. When teacher and Helena had finished the task, Helena had not learned to do the task. Instead she was feeling incompetent and frustrated.

The case study is a good example of unsuccessful interaction. Interaction with anxious pupils is more difficult than with normal pupils because of their biased attention and judgments. Anxious pupils need a learning environment where they can feel safe.

References

- Hembree, R. 1990. The nature, effects, and relief of mathematics anxiety. *Journal for Research in Mathematics Education* 21 (1), 33–46
- MacLeod, C. 1999. Anxiety and anxiety disorders. In: T. Dalgleish & M. Power (eds.) *Handbook of cognition and emotion*. 447-477. Chichester, UK: Wiley