

# How can we move beyond 'fixed-ability thinking' to create learning without limits in schools?

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The Education Research Centre and School  
of Education

*Education Research Seminar, Thursday 8<sup>th</sup> January 2015*

**Dame Alison Peacock**  
The Wroxham School  
**Dr Rachel Marks**  
University of Brighton



**University of Brighton**

## Presentation Outline

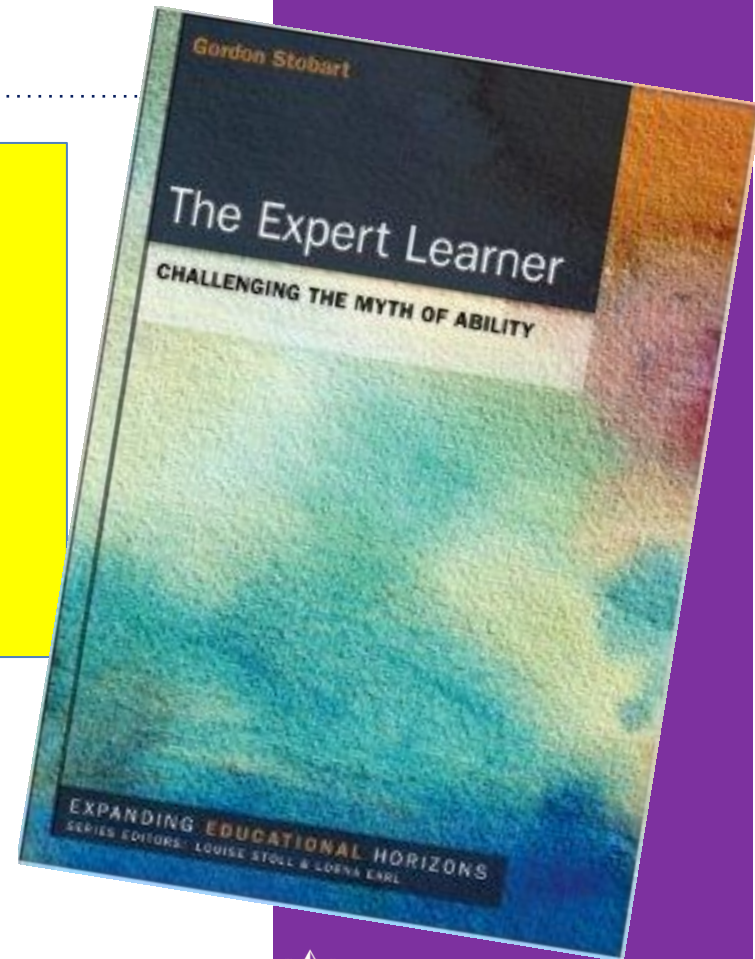
- What is ability and what do we mean by fixed-ability thinking? (Rachel Marks)
- Children's and teachers' beliefs about mathematical ability and the implications (Rachel Marks)
- Looking at alternatives: Creating 'learning without limits' in the Wroxham School (Alison Peacock)
- **Discussion:** Are there other alternatives?



# What is ability and what do we mean by fixed-ability thinking?

- Can we give somebody ability?
- Can we improve someone's intelligence?

*(Stobart, 2014, p.11)*



## What is ability and what do we mean by fixed-ability thinking?

“Genes do have an important role, but this is much less direct, and far more complex, than is often assumed. Any claim that there is a gene ‘for’ maths, happiness or schizophrenia is guilty of misleading oversimplification. What we now know is that complex behaviours are multiply determined and that it is how genes are *expressed* that counts.”

(Stobart, 2014, p.25)



## What is ability and what do we mean by fixed-ability thinking?

“Why do we think that we can make him (‘not very bright Jimmy’) brighter than God made him?”

*(Woodhead, 2009)*

“It seems to me that 1000 kids in a comprehensive, sooner or later, the ones who are good at maths will have to be told ‘you are good at maths’ and the ones who aren’t, will have to be told ‘you are not good at maths’ ... you should be learning as a young person that there are limits to what you can do.”

*(Richard D. North, The Big Questions, 2009)*

## What is ability and what do we mean by fixed-ability thinking?

“Ability acts as an *unrecognized* version of ‘intelligence’ and ‘IQ’. If we were to substitute ‘IQ’ for ‘ability’ many alarm bells would ring that currently remain silent because ‘ability’ acts as an untainted yet powerful reconstitution of all the beliefs previously wrapped up in terms such as intelligence.”

*(Gillborn & Youdell, 2001, p.81)*



## What is ability and what do we mean by fixed-ability thinking?

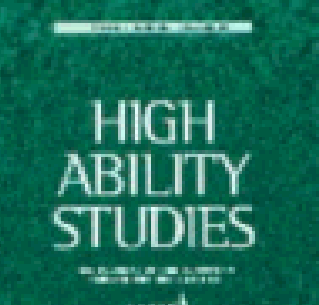
“Whereas research shows the plasticity of the brain and the ability of students to develop smartness through hard work and challenge, some schools bombard students with the messages that ability is fixed and that some students have talent and intelligence while others do not”

*(Boaler, 2013)*

More than 90% of teachers and parents believe genetic influences to be more than or at least as important as environmental factors in mathematical attainment.

*(Kovas et al., 2007)*





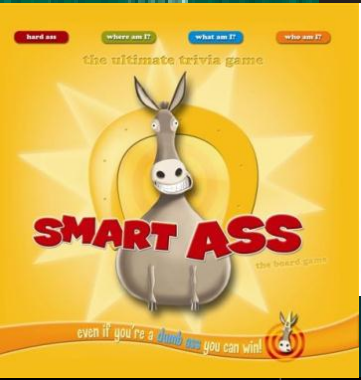
Light travels faster than sound.

This is why some people appear bright until they speak.

# Jobs for Smart People

## Right-wingers are less intelligent than left wingers, says study

Meet the schoolgirl, 12, who has an IQ of 162... making her brainier than Einstein and Stephen Hawking.



## Gifted youngsters get chance of a lifetime



## Genius with Dave Gorman

## one Britain's Brightest



## Genius of Britain



## Genius, 14, heading to university

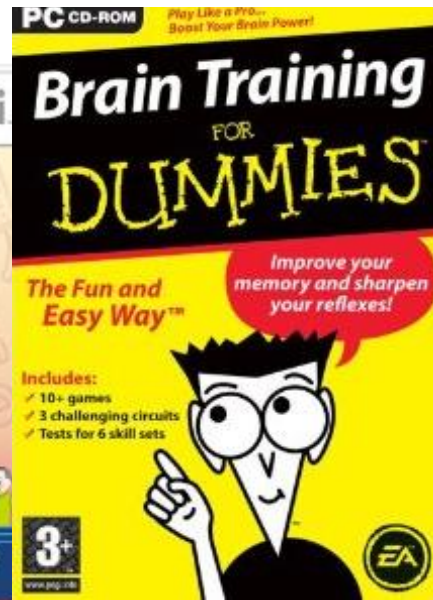
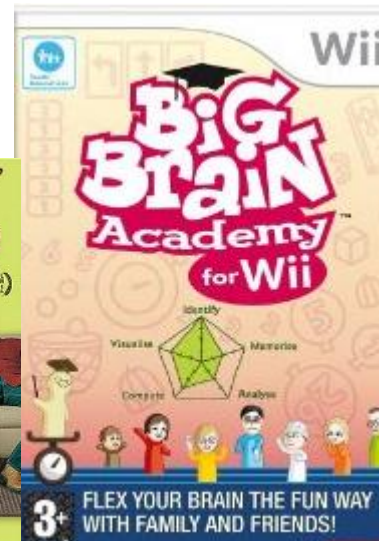
### Clever people 'live longer'

Even stupid people have feelings – let's end this bigotry

Nobody 'chooses' their level of intelligence, any more than they choose their race, says Michael Deacon.



The Evolution of Dumb.





## The study

- Two 3-11 primary schools (multi-form entry, Greater London)
- 13 classes / sets (Years 4 and 6)
- 284 pupils (including 24 focal pupils)
- 8 focal teachers
- **Avenue Primary:**
  - Full setting for mathematics from Year 2 (based on Year 1 attainment tests)
  - Limited inter-set movement
- **Parkview Primary:**
  - Mixed ability teaching from Reception – Year 5 (but...)
  - Setting for Mathematics in Year 6



## The study: a word of caution about 'mixed-ability' teaching

If your class is 'mixed-ability', what is being mixed?

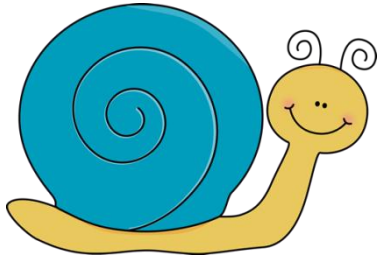
What assumptions about ability underlie mixed-ability teaching?

- Does our language change when we work with different children (for example those who bring a label of low-ability)?
- Are we more directive with particular children?
- With whom do we do more joking?

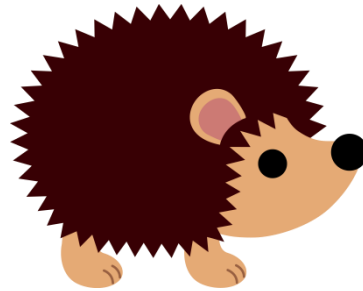
*(Marks, 2013, Stobart, 2014)*



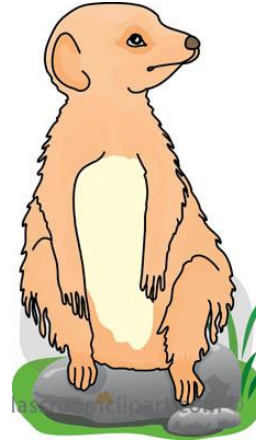
# The study: ability-group labelling



Snails



Hedgehogs



Meerkats



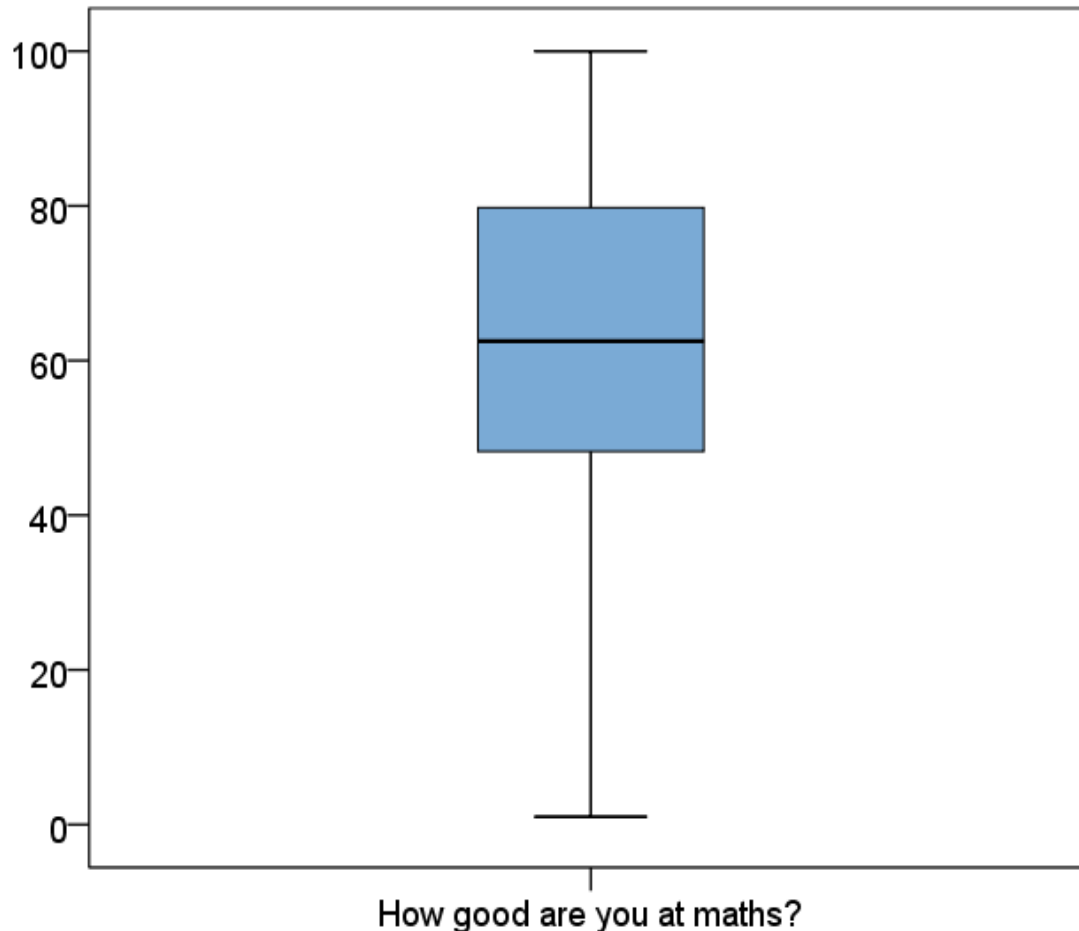
Zebras



Snow Leopards



## Children's beliefs about mathematical ability



- Long tail of weak beliefs
- Boys had significantly more positive beliefs
- Construct was stable – evidence of fixed-ability thinking?



## Children's beliefs about mathematical ability

Rachel: So what makes someone good at maths?

Wynne: Some people are really good at maths and some people aren't that good at maths. Probably it sometimes runs in the family.

Rachel: And what might make someone not good at maths?

Zackary: Some people are just not born clever.

## Children's beliefs about mathematical ability

Yolanda: Their brain's bigger. And they're cleverer and better ... it just happens. They were born like that. They were born clever.

Rachel: How much further could you make yourself better?

Peter: Just about here, not a huge way, well because you can only do so much can't you?

70% of pupils' comments reflected a fixed-mindset with a belief that mathematical ability was limited and genetically determined



## The implications of children's beliefs about mathematical ability

Sam: My friend thinks I'm dumb and so dumb that when it comes to the tests they think, they don't even give me the test, the teachers say I can't do the test and my friends think I'm dumb for not being allowed to do the test. That's how it works, I won't do the test, it makes me unhappy and I can't get better to get the tests to go up.



## The implications of children's beliefs about mathematical ability

Megan: If you are quite clever in some way, sometimes you don't want to get something wrong because other people might say something about that, so I would rather not say anything.

Olivia: If you say I'm stuck on this one they're like oh my god that's easy but they don't help you or anything they carry on with what they are doing because it's almost like, for them, a race





## Teachers' beliefs about mathematical ability

“Why we set in maths and not literacy I don't know either, don't know, no ideas, no, because it's just as big a range of ability ... it's freaked me out now.”

(Miss Barton, Parkview Primary)

“I don't know, because in Literacy we don't do it in that way, we've got bright literacy folk and weaker literacy folk and we throw them all in together ... It's odd, isn't it?”

(Mrs Jerrett, Avenue Primary)



## Teachers' beliefs about mathematical ability

That's sort of intelligence, I don't know, that's humans ... some people are not as intelligent as other people. (Miss Gundry)

They are just beginning to become aware that some people are more literacy type people and some people are more maths and science type people. (Miss Barton)

The top-group are very good auditory learners, so in other words they can listen to instructions and remember things from listening and then use that to learn, whereas if you go to the other extreme, the bottom-group, they're more kinaesthetic, where they need to move things around. (Mr Iverson)



# The implications of teachers' beliefs about mathematical ability

Limited  
challenging  
work

$$\begin{array}{r} \overset{0}{\cancel{1}} \overset{9}{\cancel{0}} \overset{9}{\cancel{0}} \overset{1}{\cancel{0}} \\ - 989 \\ \hline 0011 \end{array}$$

Procedural



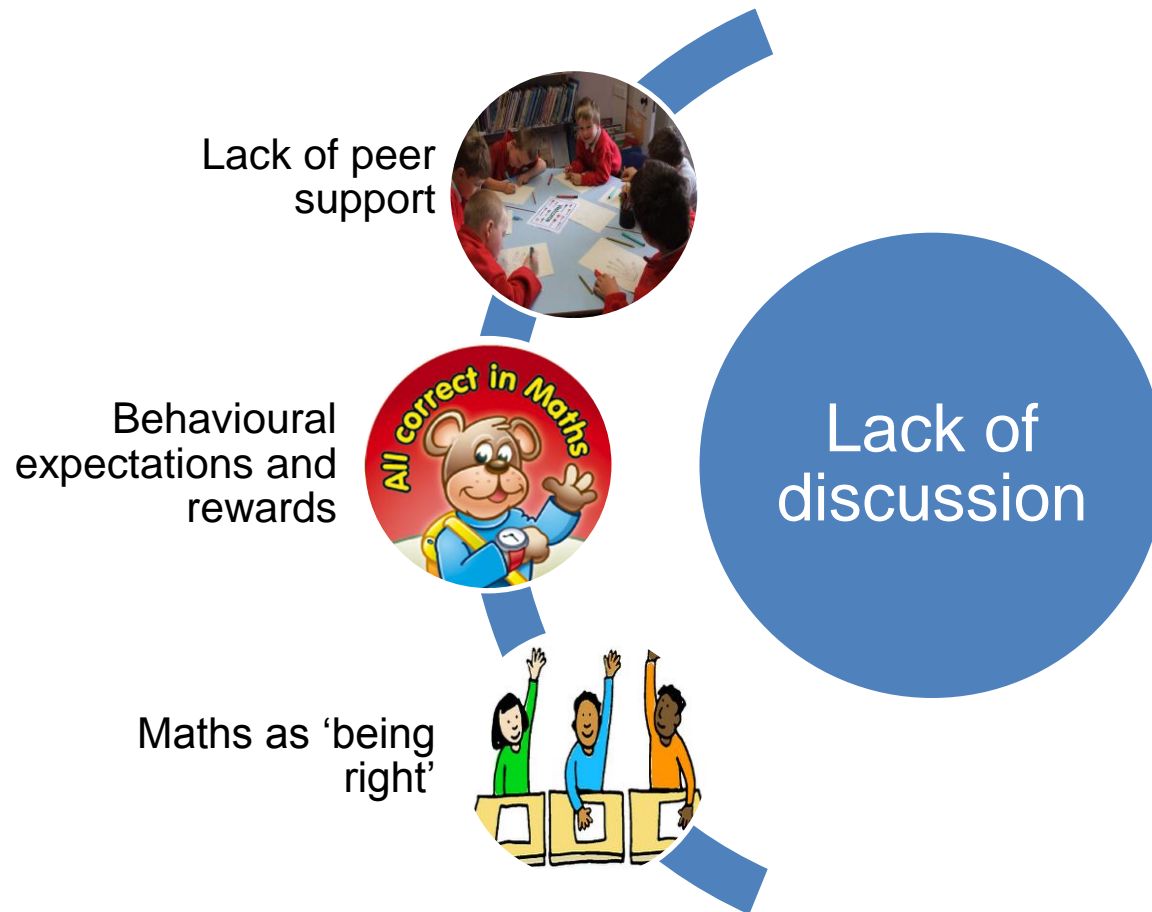
Cubes and  
counters

$$\begin{array}{r} 5 \\ + 4 \\ \hline \end{array}$$

Small numbers



# The implications of teachers' beliefs about mathematical ability



## Why is this important?

“88% of all those children placed in streams or sets, as they now are on government recommendation from four and a half, will remain in those same groupings until they leave school.”

*(Dixon, 2002, p.1)*

Ability-grouping impacts persist beyond formal education. There appear to be social justice outcomes with students taught under equitable structures more likely to enter higher status careers.

*(Boaler, 2005)*



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# Creating 'learning without limits' in the Wroxham School

**Dame Alison Peacock**



**University of Brighton**

## Discussion: Are there other alternatives?

- How have you used or seen fixed-ability thinking in schools (or beyond)?
- Does / has your language changed when working with different children (for example those who bring a label of low-ability)?
- What alternatives have you seen to fixed-ability thinking and practices?
- What are the constraints and affordances for change?



## Plenary: Why we should work towards alternatives

“Consider the worst case scenario: a boy is placed in the lowest group for both mathematics and English, with only eight other students. He is taught the most limited curriculum by the least experienced teacher, who thinks these students have little ability and teaches lots of revision of basic concepts. The student learns to feel he is inferior, stops trying and only ever hangs around with boys who feel the same way. What is the likely outcome for him and for society?”

*(Macqueen, 2012, p. 13)*

Through alternative thinking, we have the possibility to disrupt this.





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