

Changing Mindsets

A potential Route to Overcoming the Poverty Stereotype Threat

Dr Sherria Hoskins, Psychology



Overview

- Setting the scene - working with PCC
- Theoretical Underpinning
 - Implicit Theories of Intelligence (Mindset)
 - Stereotype threat
- Our research projects
- Cost effective tips for change
- The pitfalls and learning from mistakes
- Further resources

Setting the scene. Working with local government (PCC)

Background

- From 2006 - 2014 Portsmouth pupils performed lower than the National Average at KS2 SATs and KS4 GCSEs.
- Gap relatively small at KS2 (5% lower).
- Increases by GCSE (10% lower).

PCCs Theory

- Portsmouth's higher level of poverty led to lower results.
- Poverty of aspiration in Portsmouth.

Called in to advise

- Literature Review - over 100 UK Government and scientific research reports.
- Archive data analysis (5 years back – over 1,500 pupils).

Literature Review Results

- Association between demographic factors and underachievement
- White-working class students tend to perform less well than any other group.
- Low socio economic status (SES) = low aspiration is an oversimplification.
- High and low aspiration found in all groups.
- Expectations better predictor of attainment than aspirations (Goyette, 2008).
- SES indicators – indirect impact on attainment via teacher/parent expectation (Hanson, 1994).

Archive Analysis Results

- Pupils slightly below at KS1 (1%) are 5% lower at KS2 and 10% lower at KS4.
- The only consistently strong predictor of achievement is the Fisher Family Trust's model 'Estimate based on Prior Attainment'. The principal component of this model is prior attainment at KS1 (for KS2 score) and KS2 results (for GCSE).
- KS1 - small differences in underachievement develop into a downward spiral of underachievement from KS1 to KS2 to GCSE.
- Something about the impact of early failure that is pertinent.

Thorpe, Snell, Hoskins, and Bryant (2007)

- 127 new UK undergraduates
- lower SES consistently underestimated their abilities compared to the overall cohort.

Chevalier, Gibbons, Thorpe, Snell, Hoskins, (2009)

- Misperception of own and other's ability = less likely to expect to continue to HE.

Our recommendations for PCC:

- Explore pupils, teachers and parents expectations (not aspirations).
- Focus on reactions to early challenge and failure.
- Useful theoretical underpinning - implicit theory of intelligence.

Implicit Theories of Intelligence (Mindset)

Professor Carol Dweck

- American social cognitive psychologist.
- Research interests in motivation, achievement & intelligence.
- Motivated by personal experiences.
- Led her to identify Implicit Theories of Intelligence (Mindsets).



What are Mindsets?

Growth Mindset

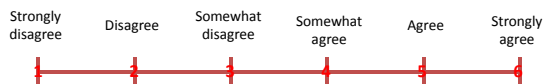
- Belief that abilities are malleable and can develop.
- Success and failure are attributed to effort and persistence, learning from mistakes and challenges.

Fixed Mindset

- Belief that abilities are something you are born with.
- Can't change it much.
- Failures attributed to self or others.

What do you think?

1. You have a certain amount of intelligence, and you really can't do much to change it.
2. Your intelligence is something about you that you can't change very much.
3. You can learn new things, but you can't really change your basic intelligence.



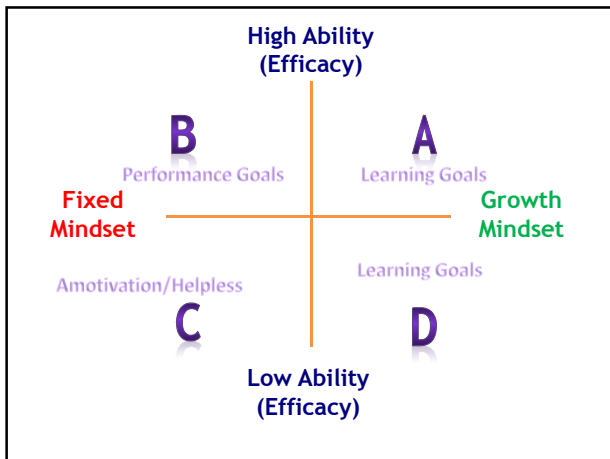
Fixed Mindset

Growth Mindset

Ability fixed & can't change much	Ability can be increased through practice
Focus on performance	Focus on learning
Failure and/or effort perceived as being sign of low ability	Not threatened by hard work or failure
Don't recover well from setbacks	Seek new challenges for a sense of achievement
Self protect: <ul style="list-style-type: none"> • Selection - choose easy activities • Avoidance (passive/active) • Social comparison • Deny value • Cheating/lie 	Mistakes are perceived as a good thing as they help the learning processes View effort and persistence as a necessary part of success

Helplessness orientation

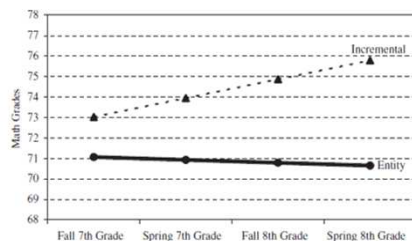
Mastery orientation



Blackwell, Trzesniewski & Dweck (2007)

Study 1: Children's theory of intelligence predicted maths grades when making transition to high school.

- Pupils with **growth mindsets** progressed faster and outperformed pupils with **fixed mindsets**.



Ericsson, Krampe, & Tesch-Romer (2007)

- Violinists from the Music Academy of West Berlin.
- Students divided into three groups:
 - The outstanding group (expected to become international soloists). Children normally described as "super talented" and "naturally" gifted.
 - The extremely good group (expected to end up playing in the world's top orchestras, but not as star soloists)
 - The least able group (studying to become music teachers- a course with far less stringent entry requirements)

The number of hours spent practising
 By age of 20, outstanding group had spent an average of 10,000 hours practising.
 2,000 more hours than extremely good group.
 6,000 more than the least able group.

Attention to Information

Mangels et al. (2006); Moser, Schroder, Heeter, Moran, & Lee (2011)



- **Fixed Mindset** students don't want feedback
- **Fixed Mindset** students want class results.
- ERPs during difficult general knowledge test - **growth mindset**:
 - more attentional resources to corrective information
 - corrected significantly more mistakes on a surprise retest
- Inducing growth mindset enhances beneficial neural process and post-error performance.

Blackwell, Trzesniewski & Dweck (2007)

Study 2: Intervention training (Brainology)

- 8 week intervention with school children.
- Study skills and mindset workshop vs study skills only.
- Over period of 2 months, mindset training promoted positive change in motivation and grades, in comparison to study skills only group.

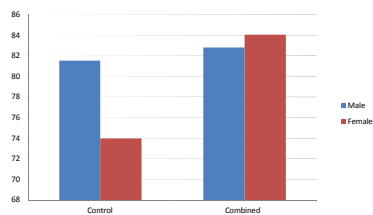
Stereotype threat

Stereotype threat

- Stereotype threat reduces the performance of individuals who belong to negatively stereotyped groups.
- e.g. maths attainment gaps - partly due to stereotypes re intellectual abilities of females, Black, Hispanic and low-income students (*Steele & Aronson, 1995*)
- Five experiments - peoples' implicit theories predict degree of social stereotyping (*Levy, Dweck, Stroessner, 1998*)
- *Salient identity.*
- Effect on beliefs/affect = behaviour = outcome
- Self-fulfilling.

Good, Aronson & Inzlicht (2003)

- Girls who received mindset training benefitted more in maths scores and narrowed the gender gap.



- Performance suppressed by stereotype?
- Boys already positive and performing well in maths.

Research so far

May not be relevant
Small numbers
One or two schools
No teacher intervention
No long term follow up
Sometimes no control

Our research projects

What about in the UK?

- Developed a programme to support UK schools
- Funded projects:
 - Education Endowment Foundation x 2
 - National College of Teaching & Leadership (Closing the Gap)
 - Solent Maths Hub – RCT
 - Portsmouth College students – RCT
 - Undergraduates (BME gap) – RCT
 - HEFCE Learning Gain - longitudinal
 - Higher Education Innovation Funding
- Worked with over 250 European schools/colleges
- Now working with parents

Intervention evaluation

Product development

EEF no' 1

Two different strands to the project (year 5 pupils):

1. The Teacher Intervention:

- ❖ 30 schools in Portsmouth/Southampton/Hampshire.
- ❖ Teachers in **half of the schools** had 2 mindset INSETs

2. The Pupil Intervention:

- ❖ 6 schools in Portsmouth.
- ❖ assessed the effectiveness of 10 Changing Mindsets Workshops, compared to 10 Study Skills Workshops
- ❖ Included 4 Pompey Twist sessions

- Mindset (*belief*)
- Learning Orientation (*learning behaviour*)
- Standardised literacy and numeracy (*outcome*)

Results – 10 months on

Mindset (*belief*)

Pupil intervention	INSET
No overall significant impact	Increased growth Mindset for FSM eligible pupils

Learning orientation (*learning behaviour*)

Intervention group significantly more mastery oriented than control group

More likely to embrace challenge, see failure as learning process, be persistent with effort, seek strategies for success.

Attainment (*outcome*)

INSET	Pupil Intervention
No systematic stat sig. or meaningful difference	Change not stat sig. (approaching sig.)
	Change systematic (all pupils in Maths and English)
	Meaningful (2 month more progress than the control group)

Results – Teachers' views

- Children understood the Mindset theory.
- Enabled pupils to verbalise their learning process
- So far, feedback has been positive
- A lot of teachers have said they feel they are poor learners, education not for them.
- Consistent use is necessary, needs to be part of a whole school approach (regular INSETs, cascade learning, provision of materials).

"Empowering for children, empowering for teachers"

NCTL Results

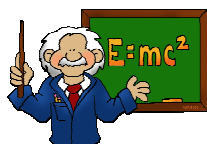
- Year 1 – impact attainment of FSM pupils positively.
- Year 2 (FSM only) – some positive impact but not really much different to other techniques or normal teaching.
- Alongside main trial
 - Bentley Wood High School trial
 - improves metacognitive skills and motivation
 - The Queen Katherine School trial
 - same positive impact on the mindset of high and low attaining pupils

<https://nctl.blog.gov.uk/2015/11/02/closing-the-gap-test-and-learn/>

Cost effective – tips for change

How you can help

1. High Expectations
2. Coping with emotions
3. Celebrating Mistakes
4. Praise (Growth Feedback)



Set High Expectations

Lowering expectations does **not** raise self-esteem or attainment

- Pygmalion in the classroom (Rosenthal & Jacobson, 1968)
- Implicit signals have a big impact on the brain (Barry-Kauffman)
- High Expectations vs pressure.
 - Expectations focus on learning, not just outcomes.
 - “You can achieve this”, not “I want you to achieve this”.



The consequence of low expectations

Instructors with an entity theory comfort
(and demotivate) students (Rattan, A., et al.)

Fixed mindset teachers:

- more likely to diagnose student as low ability based on single, initial poor performance (65%).
- comfort students for presumed low ability ("I'm going to give you some easier tasks so you can get more comfortable with those")
- Had students who felt *less encouraged and motivated*
- Had students that expected to receive a lower final grade.

Coping with Emotions

- Resilience requires the ability to *overcome negative feelings* about difficult tasks.
- Simply physiology – complex interpretations
- Misinterpretations/alternatives.
- Talk about negative feelings – helps to off-load anxiety so mental resources can focus on task in hand.
- Help pupils to link positive interpretations to increased arousal/hard work:

"My heart is racing, wow I must be learning"

"This is exciting *but* challenging!" to "This is exciting *and* challenging!"

Mathematician: Laurent Schwartz

..I was always deeply uncertain about my own intellectual capacity; I thought I was unintelligent. And it is true that I was, and still am, rather slow. I need time to seize things because I always need to understand them fully. Even when I was the first to answer the teacher's questions, I knew it was because they happened to be questions to which I already knew the answer. But if a new question arose, usually students who weren't as good as I was answered before me. Towards the end of the eleventh grade, I secretly thought of myself as stupid. I worried about this for a long time.

I never talked about this to anyone, but I always felt convinced that my imposture would someday be revealed: the whole world and myself would finally see that what looked like intelligence was really just an illusion. If this ever happened, apparently no one noticed it, and I'm still just as slow. (...) At the end of the eleventh grade, I took the measure of the situation, and came to the conclusion that rapidity doesn't have a precise relation to intelligence. What is important is to deeply understand things and their relations to each other. This is where intelligence lies. The fact of being quick or slow isn't really relevant. Naturally, it's helpful to be quick, like it is to have a good memory. But it's neither necessary nor sufficient for intellectual success.

Celebrating Mistakes

- The fear of making mistakes can stop children from trying.
- Discourage covering up or blaming others for mistakes – instead try to encourage celebrating mistakes!
 - A normal part of learning process for everyone
- Create space to make, discuss and learn from mistakes.
- Use role models: when you have good examples of success, explore the strategy, persistence, effort and mistakes.
- Don't let talent and luck myths pervade.

Mistakes Board

We are proud to make mistakes
because they help us learn

"Anyone who has never made a mistake has never tried
anything new" – Albert Einstein



Associating mistakes/process with Maths

Every time a student makes a mistake in mathematics, new synapses are formed in their brain (Dweck, 2012)

When students make mistakes in math, brain activity happens that does not happen when students get work correct (Moser et al., 2007)

My favourite No

<https://www.teachingchannel.org/videos/class-warm-up-routine>

Create tasks and activities which have some space inside them to learn: you can even change a simple, "closed" problem into an "open" one that encourages students to think.

– E.g.: instead of asking "Find the area of the rectangle", ask "How many different rectangles can you draw with an area of 48cm^2 ?"

Opening up Maths: <http://vimeo.com/76884124>

Language/Praise

We may encourage fixed Mindsets without realising it

"Let's try an easier one"

"Never mind you are good at other things"

"Science just isn't one of your talents, you're more creative"

"You are so clever"

"You are such a natural at physics"

"This is definitely a gift of yours"

"You seem to be able to turn your hand to anything"

This type of person/ability focused feedback causes...

...Temporary high self-esteem if performed well but longer term implications:

<http://www.youtube.com/watch?v=mGTk6yeh9qE>



Growth Feedback

Give 'process praise'

- Effort
- Strategy
- Interpret setbacks as lack of effort, persistence or result of inappropriate strategies

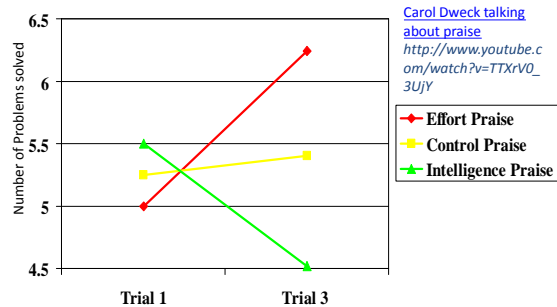
Use 'task/product praise'

- What is better/worse than the last attempt?
- What is/is not good, realistic, neat, correct etc. about the product?

Growth Focused Praise...

"You tried really hard and it's even better than the last one."
 "That is the best one that you have done yet!"
 "That was a good way to do it."
 "This is so good that I think you should do the harder questions next time."
 "Try different ways until you find the right one for you."
 "Why not take some more time to improve this bit."
 "Everyone has to work at it."
 "I know that you can do better than this with a little more focus."
 "You could have been clearer in the way you expressed that"
 "That approach might not be the best for you."
 "what went wrong with the ... can you think of some other ways to do it?"

Mueller & Dweck (1998)



The pitfalls

- There will be no impact if the work ends at the INSET.
- Mindset message means different things to different people.
- Growth Mindset is for challenge, so provide challenge.
- False Growth Mindset. Learning orientation scale better.
- We should be working with parents/other groups too.
- Misunderstandings – still celebrate outcomes, not just a focus on effort (about learning from mistakes, encouraging exploration of different strategy).
- Polarised debate – not a magic wand or a fad.
- We need more research – critical periods, generic or specific, how does it develop?

More resources

Dweck's online articles

Articles available online from Carol Dweck, just visit her website:

<https://www.stanford.edu/dept/psychology/cgi-bin/drupal/cdweck>

NIESR report

Our first EEF randomised control trial

https://v1.educationendowmentfoundation.org.uk/uploads/pdf/Changing_Mindsets.pdf

Positive Edge Education

Online mindset materials for schools and pupils:

<https://positiveedgeeducation.com/>

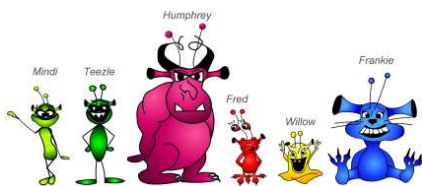
Growing Learners Resources

- A tool to identify pupils' learning orientations.
- INSETs to support school intervention, incl.
 - Intervention Manual
 - Lesson Plans and Materials
- Parents workshops
- Bespoke services.
- Story books
- Coming soon
 - More story books
 - Parents' app
 - Learning materials...



"I don't divide the world into the weak and the strong, or the successes and the failures... (or the high and low ability) I divide the world into the learners and non learners."

Benjamin Barber





Thank you!

Any questions?

growinglearners@port.ac.uk

Twitter: @GLearnersUoP

www.port.ac.uk/departments-of-psychology/community-collaboration/growing-learners/
