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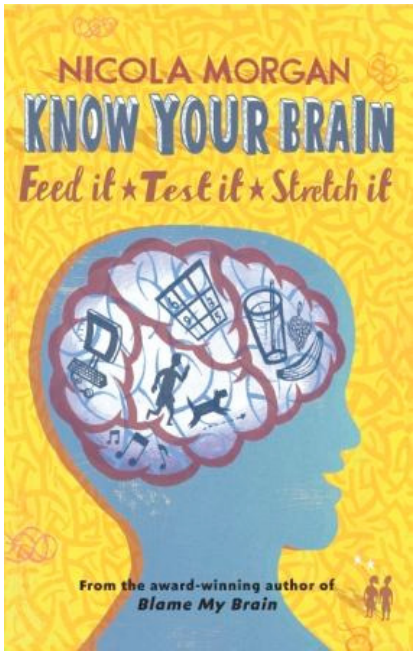
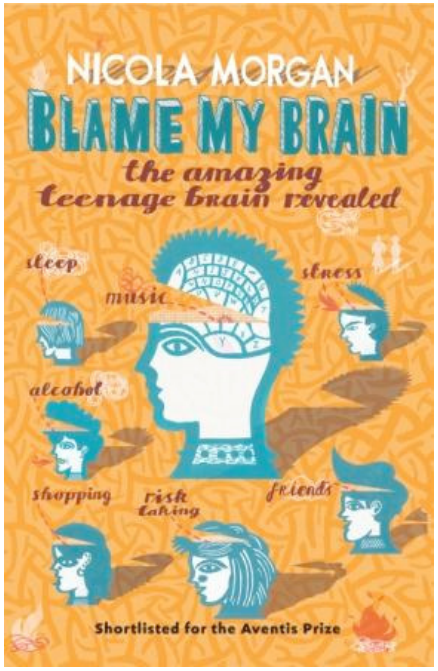


My brain, your brain, the teenage brain - the same, and different



About our brains

- **Plastic**
  - **Everything we do changes our brain**
- **Vulnerable - but much over-capacity**
- **Same and different**
  - **Same: mammal, human**
  - **Different: genes, experience, gender, age**

A quick brain exercise

(for you, not me!)

Your brain is now flooded with

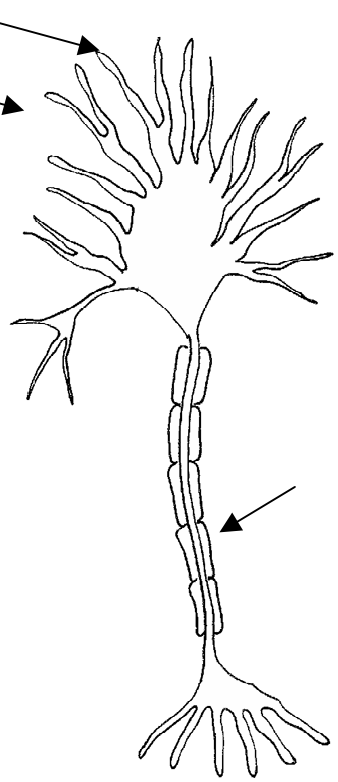
dopamine

I call it the “yes” chemical

Our brains contain:

neurons - 100 BILLION

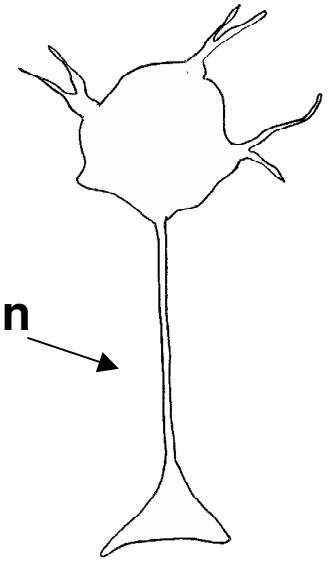
dendrites - up to 100 thousand on each neuron



Neurons send messages to each other VERY FAST - along dendrites

more developed neuron

axon



undeveloped neuron

How do our brains learn?

Neurons need to pass messages to each other very fast

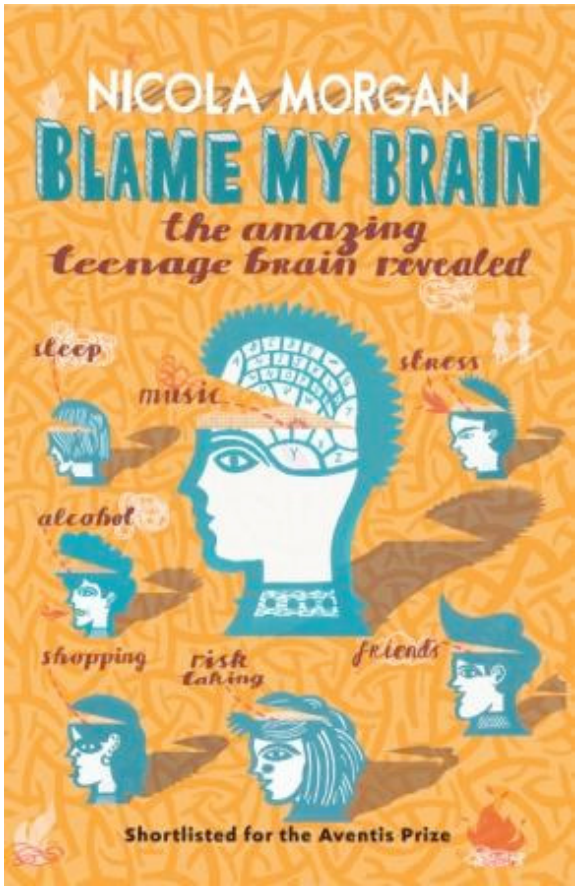
They can only do this if there are lots of dendrites to connect to

Important points

- **Number+strength of dendrites/synapses more important than number of neurons**
- **Use it or Lose it**
- **Prefrontal cortex - "control" centre**
- **Limbic system - including amygdala**

Blame My Brain

- Emotions
- Sleep
- Risk-taking - + alcohol
- Depression and stress
- Boys and girls
- Getting even cleverer
- QUIZZES in every chapter



Activity

Three groups….

Senior School Years 1+2 age 12-14

Senior School Years 3+4 age 14-16

Senior School Years 5+6 age 16-18

What differences from previous stage?

Good points and bad points?

Which group would you least like to meet on a bus??????

Science and the teenage brain

Stage 1: 10 - 12/13 - 15-20% extra neurons

Stage 2: 13 - 15/16 - 15-20% die

Stage 3: 16 - 23 - myelination (strengthening connections)

Prefrontal cortex develops last - control, judgement, decision

Sleepy heads

- Younger children + adults need 8 hrs sleep - teenagers need 9 ¼
- Melatonin timing
- = Many teenagers sleep-deprived
- Sleep deprivation → stress, mood swings, bad concentration, worse grades …

A risky business

- **Risk is good and necessary for success**
- **Biology encourages risk: dopamine**
- **But *good* risk-taking needs good decision-making - which needs a good prefrontal cortex**

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