

Stella Collins interview

Is a tour of the brain a trip worth taking?

I can think of no more interesting journey. Whilst we have probably learned more in the past 20 years about the brain than in the whole time since life began, there is still a vast amount to explore. It's like the bottom of the ocean; the more we know the more we realize there is to know. Your brain is a wonderful place to visit; it controls most of what you do whether you're aware of it or not and the more we understand it the better we can work with it.

As you tour the different regions, you discover each has its own specialized function but communicates and connects through complex networks to function as one organ; potentially the most complex network in the universe.

It's densely populated by a fascinating range of multifunctional cells such as neurons, glial cells and astrocytes all with their own role to play. You may have read you have about 100 billion neurons but a more accurate count has shown you probably only have about 86 billion, but that's been more than enough so far in our history.

Currents of electricity and chemicals flow through your brain. At the moment there is an estimate of somewhere between 30 and 100 neurotransmitters in the brain and that disparity of numbers shows how uncertain some of the research is. However, there are about 10 neurotransmitters that seem to do most of the work, as far as we know.

The souvenirs from this trip are a greater understanding of yourself and other people; our behaviors, habits, actions, thoughts and feelings. For me it's a fantastical journey of mystery, discovery and practice that continues to fascinate as more is revealed.

What is the alternative to 'soft and fluffy' training?

"Soft and fluffy training" may have acquired that name because there wasn't always sound evidence beyond our experience (not to be underestimated) to explain why, for instance, you make fairer decisions after lunch.

So called, "soft skills" training is usually considered to be the non-technical things you need to do in order to do your work. We need these skills because we are social creatures who need to communicate, work together and collaborate to survive. In reality, "soft" skills are often harder to acquire because by the time we "learn" them at work we've already developed complex habits. This can require more work than learning "knowledge", the technical parts of our job, because we have to break those habits and relearn.

In the past, and sadly still today, trainers/designers use random bits of research or exercises without really understanding why they work. Exercises are often "energizers" to wake people up after they've suffered cognitive overload from too many power-point slides. When the trainer is challenged it's harder for them to justify why for example, they are asking a busy senior executive to take 15 minutes to nap or to play a game. This can give soft skills training a poor reputation.

Cognitive psychology provides valuable evidence to back up what and how skilled trainers, teachers and educators previously taught through experience. Now neuroscience can

provide more in-depth evidence of what's actually happening in people's brains when they feel socially isolated or motivated, and helps us find techniques to "hack" into those experiences more effectively.

The alternative to "soft and fluffy" training is learning that is natural, evidence based, engaging, inspiring, enjoyable, challenging and gets results. Humans are good at learning or else we'd have died out years ago so we need to harness those skills rather than focus on cramming in more content. Plus when you understand the science of learning it becomes much easier to demonstrate to sceptics, busy executives or disillusioned students how a particular activity will benefit them.

How important is memory?

Imagine your life without memories; without them you are not really you. Clive Wearing was a well-known, conductor and musician who lost his memory due to a virus. He became incapable of remembering anything for even a few minutes with devastating effects on him, his work and his family.

At work we need people to use their memory to apply their learning in the workplace. For many types of learning the "knowledge" is only the first step and it's the ability to recall and practice skills that turns it into real learning. Just being able to recognize some information is not sufficient, which is why most multiple choice tests are very poor tests of learning.

Memory may be more important for predicting the future than remembering the past. Decision making is almost always a comparison between memories of different experiences from the past in order to decide what to do in the future.

You may remember which switch is the important one, or how you persuaded your manager last time, but both are only valuable to predict what action is going to be most effective next time.

The study of memory shows us we can improve our memories but there is a limit. You may be familiar with the research on London cab drivers who learn the "Knowledge", a complex test of all the streets, landmarks, etc., in London. These taxi drivers were found to have an increased number of neurons in part of their hippocampus (area of the brain important for memory).

However, further research showed there was a decrease in other areas of their hippocampus so whilst their memory for spatial awareness was improved other memory capabilities were potentially reduced.

So you can improve our memory but it's not infinite and neither is it always accurate. Memories are encoded, stored and reconstructed every time you recall something and its quite easy to introduce inaccuracies; store the memory again with the error and then the next time be utterly convinced that what you remember is "fact". It's never worth having an argument over what you remember because it's equally possibly you're both right or both wrong in equal measure.

Neuromyths [. . .] which one bugs you the most?

Great question – there are plenty to choose from. I think the one that we only use 10 per cent of our brain amuses me most. If you're only using 10 per cent and I offer to remove the other 90 per cent how do you feel? Your brain is about 2 per cent of your body weight but uses at least 20 per cent of your energy reserves. Unused parts would atrophy because we wouldn't waste energy on bits we didn't use.

Whilst we don't have infinite capacity in our brains we can use them better, usually by avoiding multitasking which degrades performance on all the things you're doing.

What can we learn from the way sea slugs learn?

Sea slugs don't really have brains at all but they do have about 100,000 neurons and we can learn from observing what happens there because it's a simplified system and their neurons are relatively large. It's still complex but it's easier to link specific changes in their neurons to a particular behavior because of the reduced complexity.

Researchers can also look at the chemical changes in the "brains" of sea slugs to examine the impact of different neurotransmitters and their effects. There's a lot of research on the basic mechanisms of memory being done on sea slugs because whilst we've been studying memory since the 1800s there is still controversy and debate about the basic mechanisms of memory storage and retrieval.

In terms of genetics our neurons and sea slug neurons are pretty similar but we have so many more connected in more complex networks. This means you can't always extrapolate from what happens in the head of a sea slug and say it's the same as in your brain but it's a valuable place to start.

"Learning uses a lot of energy" [...] how do we avoid tiredness?

The best way to avoid tiredness is to sleep well. Sleep is so vital for our brains and bodies that without it we progressively lose our mental capacity and ultimately die. During sleep you consolidate the learning you've done in the day; both factual knowledge and skills learning. Sleep effectively transfers learning from short term to long term memory and frees up the hippocampus to remember more the following day. This process is still not clearly understood but without sleep you significantly reduce your ability to remember and learn.

If you're interested in sleep read the fascinating "Why we sleep" by Dr Matthew Walker. It's slightly scary as he puts many of our 21st century health problems down to lack of good quality sleep. A key thing to help you sleep better is to have a routine for going to bed; especially reducing the amount of "blue light" you see a couple of hours before you sleep. You'll not want to know this but it means turning off your phone, computer or TV.

You also need to feed your brain well and not overload it. It requires water, oxygen, glucose and nutrients which are delivered through your blood circulation. Being fitter and moving regularly improves blood flow to your brain. Think about what happens in plumbing if you introduce a bend; the flow is restricted and is the place most likely to get a blockage. If you spend all day sitting you're doing the same thing by introducing potential restriction points so keep your brain in top condition by standing or moving regularly.

"Warming up the right set of neurons" sounds complicated. Is it?

It's natural for your brain to fire up particular networks of neurons to do specific tasks or locate memories but you can't consciously fire up a particular set of neurons. Consciously, what you can do is "think" about something or experience something and your brain does the work for you automatically. When you're learning something new, start with recalling what you already know which effectively "wakes up" the relevant networks but you can't just decide to warm up your temporal cortex or the set of neurons that relate to abstract mathematics.

How key is curiosity?

Curiosity makes us look for answers, keeps us interested and motivates us to persist so it's a great tool for learning. When people are curious they'll pay attention, actively seek answers, challenge, examine, explore and test themselves turning them into self-directed learners which is vital in our busy, online world where training courses are harder to come

by. When we're curious we release dopamine which is highly rewarding and means we're more likely to repeat the experience again. Curious learners are therefore easy to motivate.

Pretend to look curious. What did you do? A colleague of mine puts some of his posters on the wall at the same angle you probably just held your head. The theory is your brain doesn't really know which happens first; are you curious because your head is on one side or is your head on one side because you're curious. Either way, it notices the angle or you experience curiosity.

About Stella Collins



Stella Collins is the author of Neuroscience for Learning and Development. How to Apply Neuroscience and Psychology for Improved Learning and Training. She has a BSc in psychology, MSc in Human Communication and is a Fellow of ITOL. Stella has worked in Learning and Development as a manager and as a trainer for 15 years and consistently uses the “brain friendly” approach to design and deliver result based training and learning programs with a creative twist. She has also written two pocketbooks on Writing Skills and Webinars, both of which were based on how peoples brains absorb information and therefore how best to present it. Stella founded the Brain Friendly Learning Group, a development network for learning professionals and delivers “brain friendly” Train the Trainer programs nationally and internationally.

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