



## Uniting Church in Australia National Conference of Lay Preachers

**Faith and Brain: life, faith and neuroscience**

**10<sup>th</sup> July, 2017**

*Dr Jenny Byrnes, Director, CTM; Doctorate in Education*

In the area of adult education, it's well known that we all learn in different ways. [*Why the restriction to adults? It's just as true for kids as well.*]

There is another reality – there is stuff that neuroscience teaches us; and also a lot of what we have been doing is being *shown* to work - we can now see why. But it's also a Pandora's Box. We now have the technology that enables us to see and measure how the brain is responding in *real time*; and then we apply that information to human behaviour.

### ***Structure of the brain.***

#### Cerebral cortex

This is the outer layer of the brain; it lies around the outside of almost the entire brain, and is where everything we consciously learn is stored, in what is a kind of series of maps. With continued use, these maps get hard-wired, that is, develop an automatic level of operating.

The two parts of the brain not thus covered are:

#### The Pre-frontal cortex

This is the last part of the brain to develop – not until our mid 20s!! [Now we know why teenagers are so immature – it's biological.] This is the part of the brain that is creative and problem solving; it can handle a maximum of 7 bits of learning at one time – but note also that multi-tasking is ALWAYS slower than dedicated concentration. The right side is the seat of judgements and negative thinking; the left side is the creative side. And the pre-frontal cortex consumes huge amounts of energy (glucose).

#### The Limbic System

This is the basic “animal”-like part of the brain: the core survival area; it includes also the top part of the spine. The limbic system deals in feelings; it responds instantly and is faster to activate than conscious thought: that is, when you think you're in the process of making a decision, your limbic system has already set it up for you. This is the part that reacts when somebody “presses our buttons”. It is very powerful.

### ***Some insights***

#### The brain is a connection-making machine

We have many millions of brain cells, and each one is looking to make connections with (in theory) all the others: the theoretical number of permutations is almost uncountable. The brain also tries to set up as many hard-wired connections as possible, because maintaining them takes (relatively) little energy; but those hard-wired connections also create our continuing background perception of the world, and it's almost impossible to deconstruct a hardwired pathway; yet it's easy to set up a new pathway!

#### No two brains are alike.

We all make connections in different ways – “there are more possible ways to connect the brain's neurons than there are atoms in the universe”.

#### The brain hardwires as much as it can.

Consciousness, ie thinking and creating new connections, is slow and expensive, and subject to error, so the brain uses learned, hardwired pathways as much as it can: this and saves energy. Staying focussed also costs energy, so we need to do things that help the brain maintain its energy level, such as stand up every once in a while, or switch between forms of stimulus.

#### It's hard to deconstruct old hardwired circuits

What's worse, the more often we use a hardwired circuit, the more it gets reinforced. So if we are tackling a difficult or complex problem, thinking it through many times, or telling the story over and over, only reinforces the problem and stops us creating new circuits.

*We understand well that we find what we're looking for – people who expect the worst from people / situations / relationships will detect and react to all the problems: they won't even notice the good things, let alone respond to them. Conversely, people who expect good things ...*

To create a new future, we need to tell a new story. If we focus constantly on the declining numbers in the church ...

It's quite easy to create new wiring

*This seems something of a paradox – we are constantly making new maps (every time we learn something new or take on board a new piece of information or a new insight). And these new circuits will become hardwired given enough attention and reinforcement.*

*If it's so easy to make new circuits, why is it so difficult to shift from the old ones to the new ones???*

## **Learning**

Learning can be painful

Not usually when the learning is something we've been aiming for, or results in something we like, such as a flash of insight. But learning that is foisted on us or is not what we expect or runs contrary to information we hold true or an attitude we hold dear – that is painful.

*Just ask a Christian (or adherent of any faith) who is confronted with a reality that runs contrary to what her/his religious faith says is true.*

The part of the brain that deals with such an "error" is close to the part the fear circuitry of the brain – for good reason, perhaps, if you're on watch on a dark night and you need to notice anything that's out of order in order to stay alive. The degree of "leakage" between learning and fear varies from one person to another. And when that leakage occurs, the hardwired circuits take over, the limbic system powers up – and higher-order thought goes out the window.

Which is why ministers / preachers who do new stuff – songs, language, liturgy, shifting the furniture, theology – encounter such visceral opposition if they don't handle it well, by, eg, setting up the groundwork for some new circuitry before they bring it in.

Note also that hardwired stuff is learned – and different cultures hardwire their people in different ways. The clash of cultures is not just an academic thing – it creates all kinds of fear as well. *Just look at how almost all countries handle the immigration of people who are "different", including Australia taking in Chinese, English, Italian, Greek, Vietnamese and now Muslim people – and dealing with Aboriginal issues. It comes out as various forms of abuse, but underneath is always fear.*

Focus is power.

Getting and staying focussed reinforces existing circuits and makes those circuits more readily accessible at a later time.

Hence the importance of getting settled before worship begins, and the Call to Worship as a formal beginning.

Expectation shapes reality

See above. But change is possible, given enough time or a powerful-enough new insight or event, and so new connections.

Attention density [aka focus] shapes identity

If you focus constantly on any one thing, the hard wiring that develops eventually shapes how you see yourself, that is, your identity.

1 We are all so different that it's wrong to think that we can think like someone else just because that person claims to be right and demands obedience – we are far better off doing our own thinking.

2 In worship, we need to give time to particular elements of worship in the same proportion as their importance. For example, we can talk all we like about grace and God's forgiveness, but if in our prayers we proceed to spend a lot of time and forceful language on what miserable creatures we are and only a little on God's goodness and love, people will respond to the time and energy allocation, not the theology. Confession needs to come within the much bigger picture of adoration and praise.

**What then are the implications for our preaching?**

### A safe place

The church (or whatever group) must be felt to be a safe place; it's fundamentally essential if people are to feel free to explore God and faith.

*Logical consequence – threats of punishment from God to do terrify people into “belief”: they enforce conformity but destroy faith, faith in a loving God, at any rate.*

### The brain is designed to create meaning.

It will always create meaning – whether it's the meaning we want it to create is another matter. It also works better if it knows what direction things are heading, hence (again) the importance of a Call to Worship of some description.

For that same reason, an introduction to the scripture reading(s) will increase the brain's ability to take up the message.

### More about a safe environment

There needs to be a minimum 4 parts praise to 1 part criticism of a person is to learn anything. Praise releases the endorphin brain chemicals that add to a sense of wellness. When threatened, the brain releases cortisol – which remains in the bloodstream for a long time and inhibits learning during all that time.

### An enriched environment

The brain thrives on an enriched environment. We do not learn in a vacuum – the environment is part of the learning. A brain deprived of stimulation will atrophy; a brain strongly stimulated will flourish. So worship and learning are enhanced by multiple varieties and amounts of stimulus: not just words but music, visual imagery (banners, PowerPoint ...), movement (even just stand and sit).

There are at least 7 kinds of “intelligence” – verbal, musical, logical, visual, movement, reflective and social. The more of these we can call on, the better the learning will be.

And allowing time for reflection is an essential one of those.

\*\* An invitational tone to a sermon, or part of it, will encourage people to participate mentally and so maintain attention.

### **What is the significance for notions of God or for religious belief?**

^ Some researchers are looking for a pattern of brain activity that switches on for religious thinking or experience. Not easy to uncover.

^ Many faith traditions assume a “soul” of some kind where spirituality resides and separate from the physical body. This is NOT the Christian (or Jewish) understanding or theology – we are a unified being. In any case, our bodies are where we feel whatever it is our “spirit” is experiencing – we are a unified being; *and it's via our bodies, ie our physical life, that we put into practice our religious faith and experience. Faith disengaged from life is not faith at all.*

*Paul spoke of a “spiritual body” when talking about resurrection, but what exactly he meant by that is perhaps a matter of speculation; except for one thing – we know he did NOT speak of an eternal soul distinct from the mortal body, but a “perishable” body raised “imperishable”.*

One option is **reductionism**. This attempts to portray religiousness as nothing more than neurophysiology – a particular set of brain activities. That makes religious faith just a bit of biology and physiology.

It also conveniently ignores that religion is much more than just mystical experience or similar. Religion is demonstrated in belief, daily practice, community liturgy, personal experience, attitudes to service and justice and action with respect to them. Reductionism fails in the face of such complexity.

Alternatively there is “**emergentism**”. That is, each of the outworkings of “faith” named just above an “emergent property” of some underlying reality; and the whole lot is so complex that, in the end, the total reality is more than the sum of the individual parts. Some may wish to call this the work of the Spirit.

## **The veracity of Theism**

*“Neuroscientific research cannot either prove or disprove  
the idea of the existence of a soul or spirit.*

*The existence of God cannot be proved or disproved  
by neuroscientific study of the embodiment of human religiousness.*

*However, one of the main objectives of such research is to promote conversations  
between scientists and theologians (and therefore) a deepening of theological thinking  
(that) takes into account the outcomes of modern scientific research.”*

*Jenny Byrnes*