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Copying Morse Without Really Trying!

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The following article had its genesis in a recent thread on the FISTS reflector, sparked off by a comment I posted to the effect that I realized I had been unconsciously copying CW in the background while doing something else. I often have the rig on in the background, tuned to one of the CW ‘watering holes’, while working on another project in the shack. This time however, the ‘light-bulb’ moment came when I was doing a newspaper crossword puzzle with a Morse tutor running in the background. The tutor was sending random call signs at 30wpm and 25wpm Farnsworth (I am working on my contesting skills!), and it suddenly dawned on me that I had been copying quite a few of the calls without really trying, at speeds somewhat beyond my comfort zone.

The following has been authored by Chris Pearson, G5VZ a practicing Neuropsychologist and enthusiastic CW operator. Chris kindly gave his blessing to my suggestion that I submit it for publication in *Solid Copy*. I hope it is of interest to the membership at large and the Advisor community in particular; it certainly interested me!

The Neuroscience of Copying Morse Chris Pearson, G5VZ

A great deal of what we do in life is achieved through non-conscious processing. What is often called the subconscious mind. That applies to driving sometimes: how often does someone arrive at their destination and realize they have no real, conscious memory of the journey? But driving, generally, is done without conscious thought – working those pedals, and steering wheel and all that, would be overwhelming if you actually thought about it all the time.

There are two types of memory: **explicit memory** consists of event memories – autobiographical memory – and facts you learn. Knowing the capital cities of all the countries of the world is an achievement of explicit memory. Knowing that PARIS represents a 50-unit, conveniently standard Morse word is an explicit memory.

Implicit memories are neural networks that are activated without thinking *about* them. Some things, like riding a bike, begin in the conscious domain and often seem very clumsy before they become implicit.

When you hear ‘Paris’ accurately in Morse characters received at 30 wpm, that’s an achievement of implicit memory. These are the learned skills promoted by many of the old telegraphy texts.

Until really quite recently it was thought that this process happened in younger people: the brain reached a point when it had achieved all it could and, from then on, it was a slow, inexorable decline. Research since the mid-nineties has clearly shown that neuroplastic activity occurs in the brain from well before birth until the moment a person breathes their final breath.

It can be convenient to think about explicit memory as being something that happens in our conscious mind while implicit activity is subconscious. Subcortical parts of the brain that process sensory information and respond implicitly are incredibly rapid – these are structures within the brain that are essential for many survival responses.

It is said that’s the subconscious is always listening' and that is true. The subconscious continues to be active even when we are sound asleep – what would hear the alarm clock if it wasn’t?

So we can be confident that a part of our brain is hearing Morse and recognizing those patterns of sensory information whatever we’re doing. There’s a picture of the human brain, divided into three evolutionary parts by Paul MacLean who developed the *Triune Brain Model*. We do all our thinking in the cortex which is the most recently evolved part of the brain and, slow as it is, allows sophisticated thought. Paleomammalian and reptilian complexes evolved much earlier and are rapid, and survival-enhancing.

The tricky part with Morse is having your cortical brain (often called the neocortex or the neomammalian brain) keep up. The non-conscious, limbic structures in the brain are activated and respond in millisecond timescales. The cortical brain takes almost half a second - everything we think of as 'now' is, in fact, about half a second ago. Our mind stitches together neurological events that make us think it's all happening now and that we exercise some kind of choice or control over many things that happen without conscious intervention.

Catching a ball is a classic example. It happens faster than our 'smart brain' can process events. But we have non-conscious processes that we practice and develop that make it possible. Try throwing a ball at a baby who hasn't developed this response. Same with riding a bike - our nervous system and musculature must respond for balance much more quickly than we can think. I've had conversations with typists as they bash out documents at unbelievable speeds and, on one occasion, asked one typist what she was typing: "Oh, I'm not reading it - I'm typing it." Just like those telegraphists who could (can?) hold a conversation and copy code simultaneously, the activity doesn't even need to touch their conscious mind.

Copying Morse is the same as many other neurological activities. It's not the receiving the characters that's an issue, it's transferring their information content to the cortex that is the trick!

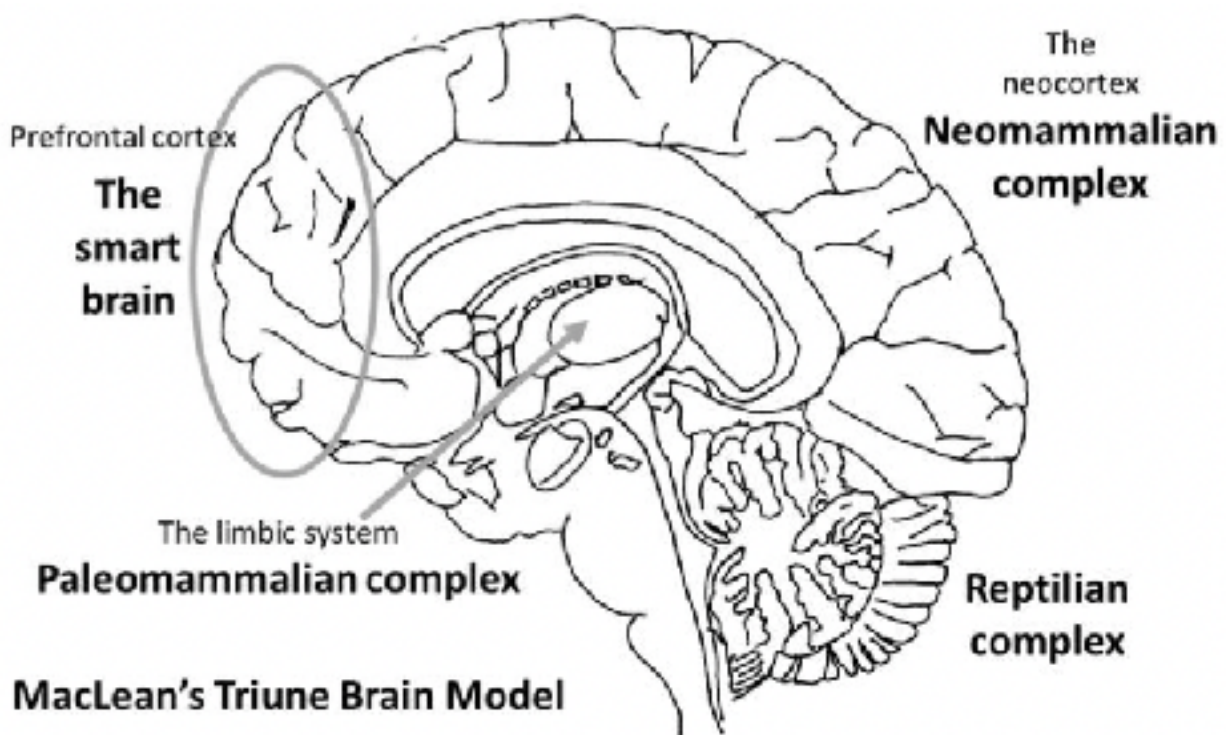
That's exactly why you may notice that distracting your cortex makes it easier. Because your cortex believes you are NOT able to copy that code. If it doesn't notice that you are, then it won't get in the way. Making the experience fun helps a lot, too!

If you are, say, *thinking* that you're comfortable at 15 wpm and you want to improve, start every practice session at 40 wpm.

You'll probably copy little accurately. Drop down to maybe 30 wpm and notice how you pick up more. Then at 25 wpm you may well be accurately copying a lot. And you will probably be surprised at how easy it seems. (I say, 'seems' because in reality, it 'is.' If someone can do it then, generally speaking, anyone can do it.)

Every time you do this – every time the particular neural network is activated – tiny cells called glial cells arrive at the synapses between the activated neurons. These calls have many functions – including the processing of neurotransmitters – but they also physically glue the neurons together – axon terminal of one neuron to a dendrite of the next – making the circuit through the network both biochemically and electrically more efficient. And faster. Most practice starts slow and speeds up - in exactly the opposite way to the way brains work.

I learnt all this, by the way, not from a radio ham but a professor of neuroscience who had a great deal of theory to pass on and some functional MRI scans to prove it.



Biographical Note: Chris Pearson became interested in amateur radio around the age of 12. He moved from London to Northfleet in Kent and spent many hours in the shack with Bill, G5VZ. He was taught Morse by Bob, G3ORC (SK) who had been a RN telegraphist and, after marriage and children, came back to amateur radio and was licensed M0JRQ. You may have seen the call on the G-QRP Antenna Handbook and other publications, including compilations

of Drew Diamond's Radio Projects. Having the opportunity to honor Bill and keep the call G5VZ on the air, Chris is now 100% CW. Although in later years, Bill was not a fan of the key.

As a psychotherapist, Chris gained Clinical Neuropsychotherapy certification at CDSC at Brisbane Royal and Women's Hospital, then a post-graduate degree in Neuropsychotherapy in Queensland, Australia in 2018. He works as a Neuropsychotherapist.



Chris Pearson, G5VZ