Neuro Rapport

(Mirror Neurons and the Cable Hub Metaphor)

By Joe Cheal

The purpose of this article is to provide a little background on the 'neuro' aspect of neuro-linguistic programming with some recent research in the field of neuroscience.

Introduction

NLP is the study of subjective experience and our subjective experience of the outside world relies on our five senses. As this information is processed and stored in the brain we are able to access some of that information in the form of 'internal representations'. Obviously, the internal representations are based on the five senses:

Visual – Auditory – Kinesthetic – Olfactory - Gustatory

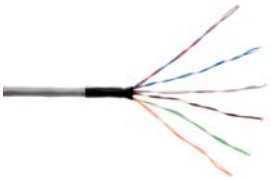
As well as sounds, the auditory also includes internal dialogue, and the kinesthetic includes touch, pressure, movement and emotional feeling.

This information is stored in the brain in a network of neurons which are connected to one another by axons and dendrites. In this sense, our memory is a massive network of associations. To be more precise, the neurons are not actually attached to one another, they are 'connected' via synapses which are like transmitter/receivers. Between the synapses of one neuron and another is a small gap.

According to Gregory Huang (2008) the brain can alter pathways and connections as it learns through experience (known as 'neural plasticity'). The number of synaptic connections in an adult brain is about five hundred trillion and there are one million new neuronal connections formed every second. The brain has the processing capacity of one hundred trillion instructions every second, which when compared to an average desktop computer of about twenty five billion, demonstrates what an extraordinary device the brain is.

The Cable Hub Metaphor

A simplified way of explaining how the brain processes internal representations might be the metaphor of a cable hub. In this metaphor, we imagine that the brain is made up of a massive network of electric cables and cable hubs. Each hub has a range of cables coming out of it and these cables plug into other hubs. Each cable contains a number of wires and each wire channels one of the internal representations.



Although not one hundred percent accurate, it helps to explain how we can change the feeling associated with a memory (eg. person or event) without changing or removing the memory itself. When we collapse a negative kinesthetic anchor (and hence neutralise a negative state) we are removing the old charge along the kinesthetic wire. When we add a positive resource state to a memory (past or future), we are programming in a new charge that goes along that wire.

A particular set of neurons that utilise the range of internal representations are called 'mirror neurons'. This is a recent discovery in neuroscience and is of particular interest to NLP.

Mirror Neurons

A few years ago, I was on a running machine at the gym, watching a rugby match on an overhead TV screen. At one moment of brilliance, a player broke through and made a dash for it. He thundered down towards the last point of defence - a single player between him and the try line. With the precision of a ballet dancer, he sidestepped the defender and ran towards the try line. I can only assume that he scored the try because I was on the floor having sidestepped as well. I was so connected to the player (and was no doubt unconsciously replaying times when I had done this myself) that I was with him, thundering towards the try line. Unhurt though a little embarrassed, I had experienced the mighty impact of my mirror neurons at work.

When we carry out an action, for example kicking a ball, there are a set of motor neurons that fire in the brain. In addition, we have another set of neurons called 'mirror neurons' that also fire. When we see someone else kick a ball, the motor neurons do *not* fire (usually), but the mirror neurons *do*. As far as the mirror neurons are concerned, we are kicking the ball too. In fact, we can *hear* a ball being kicked and as long as we know what it is, those mirror neurons will fire. Even talking about kicking a ball or thinking about it or reading about it appears to set them off.

Marco Iacoboni (2008) suggests that mirror neurons create a map of the body and are triggered by 'potential actions' of the body as well as actual actions. There are different types of mirror neurons that fire for different reasons:

- when perceiving or grasping a particular *object*,
- when perceiving or carrying out a particular *action*,
- when perceiving or carrying out *actions that achieve a similar goal* and
- when perceiving or carrying out *actions that lead to other actions*.

Each mirror neurons seems to prefer to fire to a certain possibility. In any situation, a number of mirror neurons will fire with different 'interpretations' and the brain then

appears to compute the possibilities of these interpretations. Huang (2008) reports that the brain continually aims to reduce 'prediction error' (i.e. what it thinks will happen versus what actually happens) and claims that "everything that can change in the brain will change to suppress prediction errors." Presumably then, some of the mirror neurons will relearn if the outcome is different to that 'preferred' or predicted.

So what does this discovery of mirror neurons add to NLP?

Mirror Neurons and Rapport

The most obvious connection is with empathy and rapport. In order to get a sense of how someone else is feeling, our mirror neurons tell us. As long as we have experienced a particular emotion or action ourselves, we can then empathise with that. If we have not experienced a particular emotion or action, no mirror neurons will fire. It is as if mirror neurons are programmed with particular types of experiences once we have had those experiences first hand. Afterwards, they will fire off if they see, hear or feel something similar. Indeed, the more practised we are at a particular action or emotion, the stronger the mirror neuron reaction when we perceive that action or emotion in others.

It is equally possible that mirror neurons have played a part in our ability to socialise and connect with others. They may be responsible for our ability to learn from others and indeed to model others successfully. Perhaps they even have a role in our morals and ethics. If we had no connection to others, we would feel no sense of the hurt or joy that we might instil in others by our behaviour.

Research in mirror neurons has also demonstrated that mirroring someone else's body language (eg. your right hand with their left hand) lights up the mirror neurons four times more strongly that basic matching/mimicking (your right hand with their right hand). Mirroring produces higher rapport than basic matching. Indeed, according to Marianne LaFrance (1982), when an observer sees two people mirroring, they regard them as having more closeness than when they simply match.

Peter Enticott at Monash University in Melbourne, Australia and colleagues (2008) have discovered that people who are good at interpreting other people's facial expressions tend to have more active mirror neurons. Whether some people are born with more mirror neurons or develop more because of life experience is unclear. It seems that mapping other people's expressions and actions onto our own bodies, helps us to understand and predict that person's intentions and emotions. This also tends to boost empathy levels. It is clear that mirror neurons must also play a key role in calibration and emotional intelligence.

Mirror Neurons and Language

The mirror neurons in the brain are located in the frontal lobe and the parietal lobe. More specifically, the mirror neurons in the left frontal lobe are in an area called Broca's area which is also responsible for the development of language. It is possible that mirror neurons have been responsible for the evolution of language.

Iacoboni (2008) proposes that "the discovery of mirror neurons has strongly reinforced the hypothesis that cognition and language are embodied." There is some evidence to suggest that reading a word linked to a body part lights up the neuron linked to that body part. Hence a metaphor like 'pain in the neck' actually lights up the respective neurons. Iacoboni continues: "It is as if mirror neurons help us understand what we read by internally simulating the action we just read in the sentence." For this reason, I would add, 'may your neck be comfortable and relaxed now…'

About the Author

Joe Cheal has been working with NLP since 1993. As well as being a licensed trainer of NLP, he holds an MSc in Organisational Development and NLT, a degree in Philosophy and Psychology, and diplomas in Coaching and in Ericksonian Hypnotherapy, Psychotherapy and NLP. He is also a licensed EI practitioner.

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