Being Human
The Structure Behind Metaphor

by Dr. Richard Bolstad
Part 2

Blending and Being Human

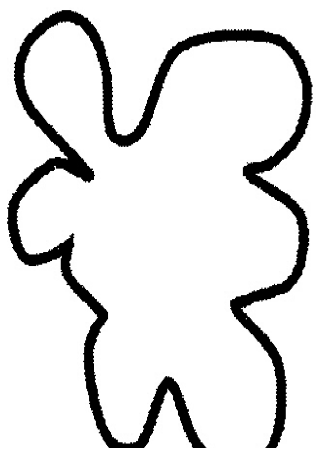
In the first half of this article I reviewed an emerging model of what it means to be human. Gilles Fauconnier and Mark Turner (2002) have suggested that the great leap forward which created modern human culture around 50,000 years ago was a result of a leap in the ability to combine two scenarios in the mind at once. The basis of simple metaphor is the combination of two compatible or isomorphic (same shaped) scenarios. Advertising often uses such metaphor. In the 1960s, for example, a man in a cowboy suit was used by Philip Morris to advertise Marlboro cigarettes. The slogan said, "Where there's a man… there's a Marlboro." This is a use of metaphor. The cowboy is seen as strong and manly, and so by implication, to smoke cigarettes is strong and manly. This type of blending is not unique to our species. Most animals can process blends where they consider that A is *like* B.

What happened 50,000 years ago was that another type of blending evolved. Here's an example of it. In the 1990s, the state of California ran a series of billboard adverts showing a profile of a cowboy's face and the caption, "WARNING: SMOKING CAUSES IMPOTENCE." The man on the billboard had a cigarette which was drooping. Understanding this advertisement requires a different kind of cognitive "blend." The advertisement is not saying cigarettes droop and so a smoker's penis will droop too. In fact, cigarettes do not droop. The advert blends two scenarios which are not isomorphic, but are actually incompatible. The result is a third scenario, an "emergent" idea which is a result of the two "input" scenarios.

This type of "double-scope blending" is the source of creativity, scientific invention, humor, art, and language itself. In the last section, I also explained how it can be used to enhance the design of therapeutic metaphors. In this second section of the article, I want to look at how this cognitive skill is achieved in the brain. As we'll see, it is also the structure behind most other NLP processes.

Can You Read Martian?

Imagine, says Vilayanur Ramachandran, Professor of Psychology and Neuroscience at the University of California, that the following two figures are letters in the Martian alphabet. One of them is called Kiki, and one is called Booba. Which is which?



You guessed it! Between 95% and 98% of respondents, whatever their native language, say that the first figure is Booba and the second figure is Kiki (Ramachandran, 2004, p 73). If the Martian story were true, it would tell us that something is very similar between Martian brains and all human brains. We already know of the phenomena behind this result in NLP. The correlation between an image and a sound is what we call a *synesthesia*. The specific qualities of the images that evoke the correlation with different sounds are what we call *submodalities*.

In another (earth-based) study, a list of several dozen words from a South American tribal language are stated to English speakers (for whom the words are incomprehensible). Half the words are names of species of fish; half are names of species of birds. The English speakers always tend to correctly categorize the words as fish or birds, well above the level we'd expect from statistical chance (Berlin, 1994).

Synesthesia is a very specific example of what Fauconnier and Turner call blending. In the example above, you immediately blended the visual quality of roundedness with the auditory sound of "Booba." That blend has the isomorphic structure of a simple Ericksonian metaphor, but the choice of characteristics to blend is not accidental. It happens not by chance and not by conscious design, but as a result of specific structuring in the brain. Knowing the neurological structure of these events may help us design better metaphors. Our language reflects this type of specific structuring already, which is why we can easily speak of "soft music" (using a kinesthetic metaphor to describe a sound) but cannot so easily speak of a "loud texture" (using an auditory metaphor to describe a kinesthetic sensation).

The Neurology of Submodalities

Ramachandran begins, "I will argue that synesthesia has very broad implications. It might tell us about things like metaphor and how language evolved in the brain, maybe even the emergence of abstract thought that we humans are very good at." (Ramachandran, 2004, p 63). To understand why this is, let me first give a brief overview of the neurology which NLP applies so well.

Perception is a complex process by which we interact with the information delivered from our senses. In figure A, we see that there are areas of the neural cortex (outer brain) which specialize in information from each of the senses (the official list of these modalities includes olfactory, gustatory, somatosensory, auditory and visual). However there is no direct connection between the sense organ (the retina of the eyes, for example) and the specialized brain area which handles that sense. The cortex is the outer area of the brain, and each sense has an area of cortex specialized for it. The visual cortex, for example, is at the back of the brain. A great deal of redesigning has to happen at other places, before the raw sensory data gets to areas of the cortex where we can "perceive" it.

Consider the case of vision, for example. Impulses from the retina of the eye go first to the lateral geniculate body (see Figure B below), where they interact with data from a number of other brain systems. The results are then sent on to the visual cortex, where "seeing" is organized. Only 20% of the flow of information into the lateral geniculate body comes from the eyes. Most of the data that will be organized as seeing comes from areas such as the hypothalamus, a mid-brain centre which has a key role in the creation of emotion (Maturana and Varela, 1992, p 162). What we "see" is as much a result of the emotional state we are in as of what is in front of our eyes. In NLP terminology, this understanding is encapsulated in the statement "The map is not the territory." The map your brain makes of the world is never the same as the real world.

Inside the visual cortex, there are several areas which process "qualities" such as color. In NLP these qualities are known as visual "submodalities" (because they are produced in small sub-sections of the visual modality). Color is one of the first fourteen visual submodalities listed by Richard Bandler (1985, p 24). The others are distance, depth, duration, clarity, contrast, scope, movement, speed, hue, transparency, aspect ratio, orientation, and foreground/background. Neurologists have identified around thirty such submodality areas in the visual cortex alone. For example, within the visual cortex, there is a small area of cells which respond only to the submodality of motion. These cells were found in the prestriate visual cortex of monkeys' brains in the early 1970s. When the monkey watched a moving object, the motion cells were activated as soon as movement began. In 1983, the first clinical cases were found of people with these specific cells damaged, resulting in central motion blindness (akinetopsia). A person with akinetopsia can see a car while it is still, but once the car moves, they see it disappear and reappear somewhere else. They see life as a series of still photos (Sacks, 1995, p 181).

Submodality Links

Studies show that changes in the submodalities in one sensory system will automatically result in changes in the other sensory systems and in emotional changes (so if you change the way your internal picture looks, you'll feel different). As an example, office workers in a room repainted blue will complain of the cold, even though the thermostat is constant, but will stop complaining if it is repainted yellow (Berry, 1961). These responses are physiological, so that sounds of about 80 decibels produce a 37% decrease in stomach contractions (Smith and Laird, 1930) This latter effect is similar to the result of "fear," and likely to be perceived as such, as the writers of scores for thriller movies know. The relationship between submodalities and the "feeling" of an experience is the basis of some important NLP processes, called submodality shifts.

In the brain, the area which controls the color submodality area is right next to an area that represents visual (i.e. written) numbers (Ramachandran, 2004, p 65). Color-number synesthesias are the most common of the "abnormal" synesthesias studied by neurologists. In these "disorders" the person uncontrollably and automatically sees each numeral as a different colour. The neurological closeness of the two areas in the brain obviously makes it easier for a person to connect these two very specific types of information. But synesthesia has wider implications. Ramachandran explains, "One of the odd facts about [abnormal] synesthesia, which has been known, and ignored, for a long time, is that it is seven times more common among artists, poets, novelists - in other words, flaky types!.... What artists, poets and novelists all have in common is their skill at forming metaphors, linking seemingly unrelated concepts in their brain, as when Macbeth said, 'Out, out brief candle,' talking about life." (Ramachandran, 2004, p 71).

By identifying which synesthesias are most common, we can trace where in the brain the most common connections are occurring. This leads us to the angular gyrus, strategically located at the crossroads between the parietal lobe (kinesthetic cortex), the temporal lobe (auditory cortex) and the occipital lobe (visual cortex). The angular gyrus and this junction have been getting progressively larger from simple mammals to monkeys and then to great apes. With the development of human beings the change is, Ramachandran says "an almost explosive development" (Ramachandran, 2004, p 74).

He explains, "We have tried the booba/kiki experiment on patients who have a very small lesion in the angular gyrus of the left hemisphere. Unlike you and me, they make random shape-sound associations." He has also tested a small number of these patients on their ability to understand metaphorical statements and found it equally absent. One, for example "got fourteen out of fifteen proverbs wrong - usually interpreting them literally rather than metaphorically." (Ramachandran, 2004, p 140). The temporal-parietal-occipital junction and the angular gyrus are the source of this ability to create abstract concepts by combining different inputs; an ability which creates art, poetry and metaphor. And here we have the missing link between the most abstract NLP processes (metaphor) and the most intricate (submodality shifts). Metaphor and submodality shifts occur through the same precise area of brain tissue, and have a similar neurological structure.

Professor Ramachandran proposes a three step sequence of neurological links (synesthesias) that could have lead humans into the higher level blending which we call language. He calls this the synaesthetic bootstrapping theory of language origin. The three links are:

- The auditory-visual link that causes you to be able to identify booba and kiki.

- The visual-auditory digital link from the Visual cortex to Brocas area where speech movements are generated. This is why the movement of your mouth in saying words like "teeny weeny," "un peu" and "diminutive" (visually-kinesthetically tiny) feels so different to when you say words like "enormous," "grande" and "huge" (visually-kinesthetically large)

- The hand-mouth cross activation link within the kinesthetic cortex (hand and mouth are sensed and controlled from right next to each other)

The Part Of The Mirror Neurons

Most synesthetic neurological links did not originally evolve to enable double-scope blending, speech, art and science. Ramachandran suggests that they first began to evolve to enable travelling through the trees. However, there is one set of links which very definitely did emerge to support advanced communication.

In 1995 a new area of neurons was discovered by researchers working at the University of Palma in Italy (Rizzolatti et alia, 1996; Rizzolatti and Arbib, 1998). The cells, now called "mirror neurons," are found in the pre-motor cortex of monkeys and apes as well as humans. In humans they form part of the specific area called Broca's area, which (as noted above) is involved in the creation of speech. Although mirror neurons are related to motor activity (i.e., they are part of the system by which we make kinesthetic responses such as moving an arm), they seem to be activated by visual and auditory input. When a monkey observes another monkey (or even a human) making a body movement, the mirror neurons light up. As they do, the monkey appears to involuntarily copy the same movement it has observed visually. Often this involuntary movement is inhibited by the brain (otherwise the poor monkey would be constantly copying every other monkey), but the resulting mimickery is clearly the source of the saying "monkey see, monkey do."

In human subjects, when this area of the brain is exposed to the magnetic field of transcranial magnetic stimulation (TMS), thus reducing conscious control, then merely showing a movie of a person picking up an object will cause the subject to involuntarily copy the exact action with their hand (Fadiga et alia, 1995). This ability to copy a fellow creature's actions as they do them has obviously been very important in the development of primate social intelligence. It enables us to identify with the person we are observing and to "feel" what they might be feeling inside. When this area of the brain is damaged in a stroke, copying another's actions becomes almost impossible. In simple neurological terms, this action of the mirror neurons is just a new type of synesthesia. But its implications for the emergence of human culture are phenomenal. The development of speech has clearly been in part a result of this copying skill. Furthermore, there is increasing evidence that autism and Aspergers syndrome are related to unusual inactivity of the mirror neurons. Ramachandran has done research showing that the mirror neurons of autistic children are not activated by seeing hand or arm movements in other people (Ramachandran, 2004, p 119). This results in a difficulty the autistic person has understanding the inner world of others, as well as a tendency to echo speech parrot-fashion and to randomly copy others' movements.

Mirror neurons, Ramachandran points out, allow us to blend visual inputs with our own internal kinesthetic responses. This is a very complex blend, and enables us to form an inner model of what is behind someone else's actions. He says, "I think that, somewhere around 50,000 years ago, maybe the mirror neurons system became sufficiently sophisticated that there was an explosive evolution of this ability to mime complex actions, in turn leading to cultural transmission of information, which is what characterizes us humans" (Ramachandran, 2004, p 38).

Finding The Place of NLP

NLP first emerged from a double-scope blending of linguistics and psychotherapy. With its emergent properties, it has become far more. NLP is part of a larger emergent phenomenon that double-scope blending has enabled humanity to attain. With NLP we are learning to consciously participate in the blending process itself. Human beings own conscious outcomes already shape the development of new words in our languages (words with complex blending such as the phrase "mirror-neuron") more often than such words are shaped by unconscious synesthesias. Our conscious outcomes also often shape our adoption of metaphors, as in my choice to use the dance metaphor when teaching conflict resolution rather than the older war metaphor so rooted into the English language (where conflict involves attacks and defenses, leading to victory or surrender).

With NLP, our conscious outcomes can also fashion the very submodalities of our perception and the consequent synesthesias we experience. And with NLP, those outcomes can enable us to choose to create rapport and to gain the resultant learnings from modeling the internal subjective experiences of others. In our NLP work with parts integration and collapsing anchors, we deliberately guide the neurological linking of "incompatible" experiences to create new double-scope blends. Metastating, as proposed by L. Michael Hall (1995), is another example of NLP using the basic process of blending to create new emergent states. NLP, then, is the systematic harnessing of double-scope blending to create a world worth living in.

Summarizing

In the two parts of this article I have attempted to reframe NLP, bearing in mind certain new insights from cognitive science and neurology. I began by explaining the model of cognitive blending proposed by Gilles Fauconnier and Mark Turner. They maintain that about 60,000-50,000 years ago humans developed the ability to use double-scope blends where two different situations are juxtaposed and emergent learnings discovered. This type of cognitive blending is revealed in the structure of our language (even in simple terms such as computer-virus) and in such diverse and uniquely human activities as art, humour, creative innovation and scientific theorizing.

This has implications for our use of metaphor in NLP and creative thinking. Effective metaphors do not just depend on single-scope blending (what NLP has called the recognition of isomorphism or similar shape). They depend on the unexpected emergent meanings which are a result of combining two very different situations in ways that cannot always be rationally explained. Einstein's looking in a mirror in front of him, while traveling on a light beam is one example. After ten years of finding no rational explanation for the combination, a new model of the universe emerged in his mind.

In the second part of the article I have explored what we know about the neurological basis of this cognitive operation called blending. Its simpler forms, according to Vilayanur Ramachandran, are revealed by synesthesias. In synesthesia an experience in one area of the cortex (for example seeing a smoothly rounded image in the visual cortex) evokes, enables or enhances an experience in another area (for example hearing a more muffled sound with gradual changes in the auditory cortex such as "booba"). The qualities of each sensory system ("submodalities," such as motion, distance, color and size in the visual sense) are stored in distinct areas within their modality. What happens in a synesthesia is that submodality changes in one system evoke specific submodality changes in another sensory system. The key brain area through which these links are made is the parietal-temporal-occipital junction and the angular gyrus, located between the visual, auditory and kinesthetic areas. Damage to this area inhibits both synesthesia and the ability to understand metaphor. Metaphorical thinking, including art and creative innovation, is a newer form of the same blending that all mammals do via the angular gyrus. Language also depends on these linkages, as well as on a newer, specific linking process run by "mirror neurons." Mirror neurons connect visual and auditory input from other human beings to our own internal kinesthetic experience, enabling us to intuit what it is like inside the other person.

NLP occupies an exciting position in the evolution of cognitive blending. It is part of an emerging ability that humans have, to choose the blending that they engage in, based on the results that they themselves desire. All NLP techniques deliver this ability, from metaphor to anchoring to submodality shifts. This article in itself emerges from several double-scope blends which I and many others have been making. I hope the emergent properties of these blends will keep you re-examining what you do as you use NLP in any field of application.

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