

The following text is based on and references the book *Spiritual Intelligence* by Danah Zohar, (Bloomsbury Publishing) and any additional text is added by the author: Mike O'Sullivan, 2022.

A definition of psychotherapy

Much of psychotherapy exists to help people break the habit of long-standing but inappropriate emotional association.

Psychotherapy and associative intelligence

We build our understanding of the world through a series (sometimes thousands) of neural connections as a consequence of our emotional responses to certain stimuli. These associations form our associative intelligence, which once formed are quite habit-bound. For example: I have learnt to associate anger to a given stimulus, so it is difficult for me to react differently when confronted by what I perceive to be the same stimulus.

Like other aspects of associative intelligence, emotions are not immediately verbal. We often have trouble talking about them, at least with any accuracy, and they are certainly not always 'rational' in the sense of obeying rules or predictions. They often respond to incomplete data in an unpredictable way.

Some pieces may be missing but what emerges is a 'best fit'

Similarly, in pattern recognition all the pieces of data from a given pattern are allowed to interact.

Some pieces may be missing, or different, from an original learned pattern, but what emerges is a 'best fit'.

Emotions are often less accurate

Thus associative intelligence is able to deal with ambiguous situations, but it also 'approximates'. It is more flexible but less accurate than serial thinking.

Emotions cover a wider range of experience than reason, but they are often less accurate.

One-off memory is enabled by precise neural wiring in a part of the brain known as the hippocampus (see pp. 94-5). This can deteriorate with age. But

we also have a slower, long-term memory system based on associative neural networks located throughout the brain.

This memory system can gradually learn new things

This memory system can gradually learn new things like bodily skills and a memory for faces, even when our memory for new events weakens. It is difficult to teach an elderly person new serially wired skills, but we can learn new motor skills at any age, even if very slowly. Swimming, or the rote learning of a song, are two examples here. Again, many of our emotional reactions are held in the long-term memory system, because their associative base has been built up over time.

Not only different neural wiring but also different biochemistries

The two memory systems have not only different neural wiring but also different biochemistries. The biochemical learning mechanism found at the synapses (nerve junctions) in associative memory changes slowly and gradually, becoming stronger by repetition whenever two neurones fire together. The biochemical learning mechanism in short-term memory, by contrast, relies on a one-off signal.

Associative thinking is learnt via conditioned response

At its simplest, associative thinking is done via conditioned response, as in the experiments of the Russian scientist Pavlov with dogs.

The animals learned to salivate at the sound of a bell after repeated presentations of food and the bell together. Neural networks allow much more complex associative patterns to be learned. Learning input takes place via some of the elements in a neural network, behavioural output via others; still other elements mediate between the two.

Neural networks have the ability to rewire themselves

Unlike serial neural tracts, which are rule-bound or program-bound and thus unable to learn,

neural networks have the ability to rewire themselves in dialogue with experience.

Each time I see a pattern, the neural network connections which recognize that pattern grow stronger, until recognition becomes something automatic.

If the pattern alters, my ability to perceive it will alter slowly, too, until my brain has rewired itself to see the new pattern. The connections between neurones in the network may have different strengths, and any one element may tend to excite or inhibit the other elements to which it is connected.

Learning changes these strengths between the connections: neural elements that fire together gradually tend to become more strongly interconnected.

While learning to drive a car, for instance, every movement of my hands and feet is thoughtful and deliberate, and my control of the car is only slight. With each practice run, coordination between hands, feet and brain is more strongly wired into the brain's neural networks until eventually I don't think (with my head) about driving unless there is some emergency.

All associative learning is done by trial and error.

When a rat learns to run a maze it doesn't follow rules, it practises. If a trial run fails, no neural connection is wired in; if it succeeds, the brain strengthens that connection. This kind of learning is heavily experience-based: the more times I perform a skill successfully, the more inclined I will be to do it that way the next time.

Associative learning is tacit (understood without rules) learning

I learn the skill, but I can't articulate any rules by which I learned it and usually can't even describe how I did so. We don't learn to ride a bicycle by reading a manual. Neural networks are not connected with our language faculty, nor with our ability to articulate concepts. They are simply embedded in experience. We feel our skills, we do our skills, but we don't think or talk about them. We develop our skills because they give us a sense of satisfaction or a feeling of reward, or because they help us avoid pain. The brain's associative neural networks cover more than those things we readily identify as emotions, but we can easily see how our emotional life fits into the associative pattern, and how it would be based largely in these neural networks.

The limbic system has both serial and associative neural networks

The limbic system, which is the central seat of emotional control in the brain, has both serial neural tracts and associative neural networks. Some emotions, like a fear of snakes, are innate, and are probably grounded in serial wiring within the limbic system.

But most emotions are trial-and-error, a slow associative build-up of response to certain stimuli. And they are quite habit-bound. Once I have learned to feel anger at a given stimulus, it is difficult for me to react differently next time.

The advantages of associative thinking

The advantages of associative thinking are that it is in dialogue with experience and can learn through experimentation as it goes along. It can feel its way with untried experience. It is also a kind of thinking that can handle nuance and ambiguity – we can remove up to 80 per cent of a given pattern and the brain can still recognize what is left. A neural network computer can recognize a postal code written in millions of different samples of handwriting.

The disadvantages of this kind of thinking

The disadvantages of this kind of thinking are that it is slowly learned, inaccurate and tends to be habit-bound or tradition-bound. We can relearn a skill or an emotional response, but it takes time and much effort. And because associative thinking is tacit, we have difficulty sharing it with others. We can't just write out a formula and tell someone else to get on with the job. All of us must learn a skill in our own way, for ourselves. No two brains have the same set of neural connections.

No two people have the same emotional life

Similarly, no two people have the same emotional life. I can recognize your emotion, I can empathize with it, but I don't have it.

Zohar, Danah. *Spiritual Intelligence* (pp. 50-56). Bloomsbury Publishing. Kindle Edition.