



## TOP-DOWN VS. BOTTOM UP & HYPNOSIS

*Notes taken from "Science" New York Times, etc.*

Raw data from the outside world reaches the sensory centers in our brain via bundles of nerve cells dedicated to each sense. From the sensory centers this raw data is sent to higher regions in the brain for interpretation. For example, the visual stimuli from a flower that we see with our eyes are turned into a pattern that is sent to the primary visual cortex. From the visual cortex it's sent to a still higher center or module where color is recognized. Finally the image, along with the color and pattern recognition is sent to a still higher brain region where its identity is encoded along with any other knowledge that has been associated with that particular flower. The same processing stream, from lower to higher, exists for all the senses. This direction of flow is referred to as "feedforward" or "bottom-up". The result of all this processing in our brain is that we become aware of the flower.

Now, for as much information that travels up, ten times as many nerve bundles are dedicated to information traveling down. In other words, more data flows down than up and this "top-down processing" feedback circuitry constitutes our consciousness...what we see, smell, feel as well as believe. Consciousness, however, depends more on the framework built from our experiences than it does on raw data alone. Therefore, each of us has a slightly different conscious framework due to our experiential knowledge and, as a result, we each have our own individual realities. So it's our experience in living that allows us to interpret or even ignore raw data so that it fits into our ongoing construct of reality. And the older we get, the more our "top-down" matches our "bottom-up".

So it is this "top-down" dominated processing that allows for the effectiveness of phenomena such as "placebo" and "nocebo" (witch doctor influenced), meditation, cognitive psychotherapy and hypnosis. When the higher regions of the brain decide upon the reality of something, then the lower regions of the brain are overruled. This helps to explain most hypnotic phenomena, positive and negative hallucinations, in particular. In the hypnotic trance, the higher regions of the brain become temporarily disconnected from the bottom-up information. So, in the trance state, the "reality-check" that normally takes place in consciousness, is shut off or shut down, or something like that.

Now, back again to the 25 foot plank 200 feet in the air: if the walker of that plank is in a deep hypnotic trance, he can respond to the suggestion that the plank is a foot off the ground and therefore he's not distracted by the "bottom-up" reality of his depth perception of 200 feet. In other words, the plank walker imposes a one foot reality instead of a 200 foot reality. Another everyday non-hypnotic example of this idea I can think of is: imagine



you're searching for a book on your book shelf and the book you're looking for you believe has a blue cover and you search and search and even resort to reading all the titles on your book shelf but you can't find it because it's a book and to attend to red requires specific connections to many places in the visual cortex where blue may not necessarily be included.

For this reason, among many others, the deeply hypnotized individual, who is temporarily dissociated from his external reality (bottom-up data) can accept different ideas of his reality, if those ideas have a basis in his experiential past. In this way the deeply hypnotized subject can behave neurologically, emotionally, psychologically and intellectually "as if" he were five years old, or looking at an ocean at sunset, or watching a young boy or girl learning to write the alphabet, or whatever "reality construct" the hypnotist suggests that's within the experiential background of the subject and in some way meets the needs of the subject.