PEER SUPPORT

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CRISIS INTERVENTION

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SUMMARY

not so much being in an event, nor its magnitude, but experiencing it as a loss of control.[26] Experiencing a terrible experience but being able to save yourself or saving another person, for example, represent protective factors for a good reprocessing of the experience, whereas undergoing a minor experience but being trapped or for some reason immobilized may leave a more traumatic aftermath. Moreover, a fundamental aspect in the process of traumatization is living the event as unacceptable with respect to one's own vision of life ("nothing bad should happen to children and innocents", "if I study and apply procedures, I will always have a margin of safety and nothing can happen to me"), almost to the point of being able to speak of a spiritual and teleological crisis: it is the interpretation of the event and not so much the event itself that is traumatic.
Unfortunately, there are some vulnerability factors that make the individual more fragile, such as age, previous experiences, knowledge of the victims or personal involvement in the event.

2.1.2 PHYSIOLOGICAL REACTION OF THE ORGANISM

In order to ensure the survival of the species, and therefore of the person who is experiencing the event, the organism activates itself by transforming the funciontinig of organs, glands and the whole system: it switch from the Parasympathetic nervous system to the Sympathetic one. In times of peace, on vacations or Sundays or when we sleep, the organism is managed by the parasympathetic nervous system: it is the nervous system that sets in motion the immune system, activates the growth hormone, regenerates the organism. It is no coincidence that our grandmother used to tell us as children to go to bed early because we had to grow, or that after a fever the neighbours would comment that we had grown taller.
When a critical event occurs, the brain responds in milliseconds, through the limbic system which we shall see later, giving prominence to the sympathetic nervous system and inhibiting the parasympathetic on. (*See Figure 1*)
The sympathetic nervous system is the system that prepares the organism for combat, and competitions, whether it be for a football game or an argument at work or a marital discussion. It is the system of danger, fear and the struggle for survival.
The switch of the nervous system is activated by the limbic system, formed by the amygdala and hippocampus: the amygdala is entrusted with management of danger to guarantee the survival of the individual, and is responsible for the reaction called "startle response"[27], a rudimentary interpretation of the incoming signals.
The amygdala normally receives the signals that come from the external and internal environment and codifies them, gives them an emotional value, and sends them to the hippocampus that synthesizes them receiving the emotional meaning roughly sculpted by the amygdala and makes sense of the image. This image forms a file that makes up the personal library, volume after volume, experience after experience. At any moment the hippocampus has the task of suspending the analysis of the present reality to dedicate

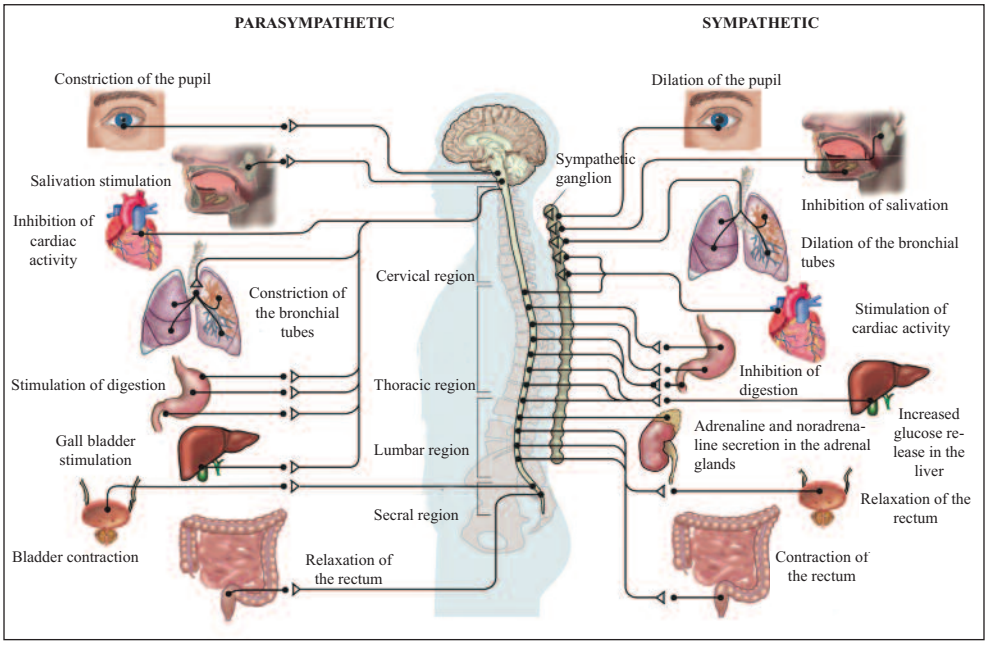

Figure 1 Sympathetic and parasympathetic nervous systems and their innervations

itself to a minute and very rapid work of comparison between the images of past experiences accumulated in the mind and the image of the present event that it is trying to decode, to find an appropriate past response that may be useful and effective now.

The hippocampus is considered the depository of our memory. The primitive representations from the hippocampus become like little pearls that make up a necklace, the necklace of our conscience. Immediately, the hippocampus transmits these raw contents to the prefrontal cortex, which in turn elaborates them in a more sophisticated way and sends back to the amygdala a more objective representation of what is happening, to correct its initial emotional colourings.

However, in any event, and above all in the case of the sudden, scarying signals, the amygdala has already started up its reaction to them, called startle response, that is much faster than the processing of the stimuli by the prefrontal cortex, where the most elaborate thought processes reside. The prefrontal cortex can take up to 500 milliseconds to process the information, and in the meantime instead the amygdala has completed an analysis that has as a consequence the activation of the sympathetic nervous system, the setting in motion of a series of neuroendocrine transformations, and the activation of the "flight-fight-freeze" response, with the involvement of much more archaic brain circuits that do not process the stimulus but immediately activate a response.

When a person hears a door slam, the amygdala registers the noise and connoting it as dangerous, passes the raw information to the hippocampus, which in turn passes it to

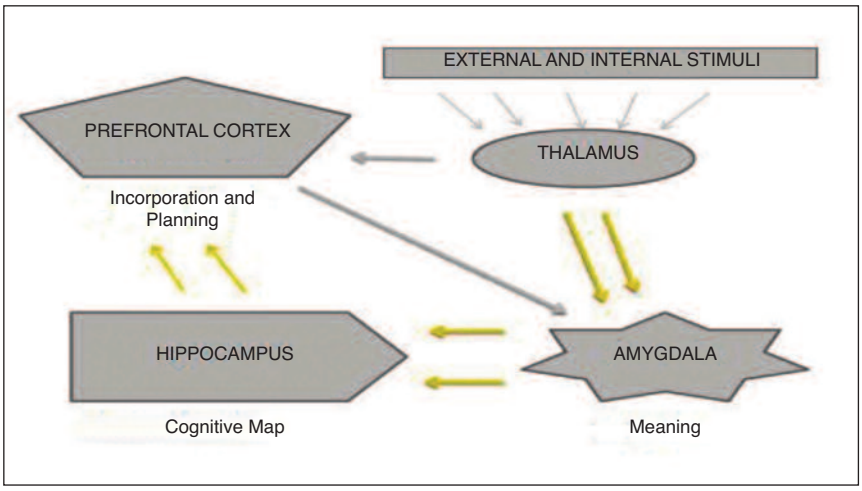

Figure 2 Stimulus processing paths

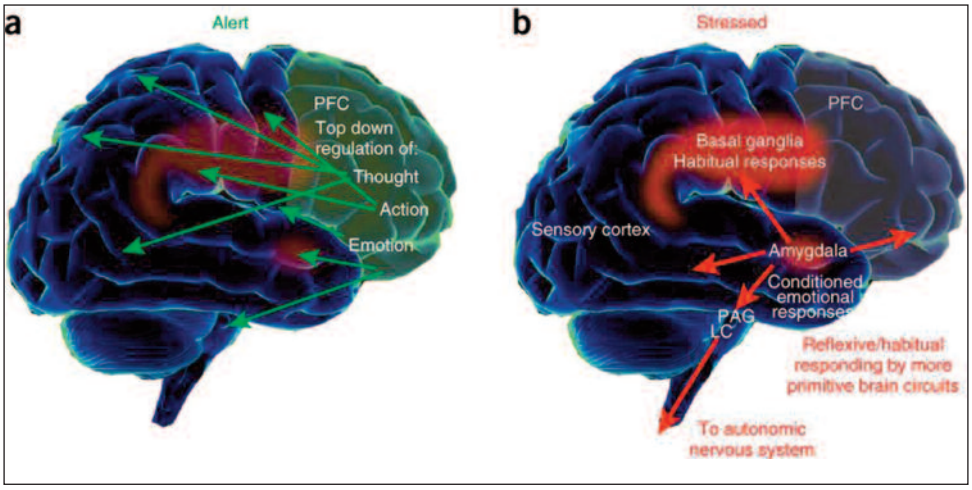

Figure 3 The amygdala takes control of behavioural response "shutting down" the more developed and sophisticated cortical areas of the brain

the prefrontal cortex, which finally processes the signal "door slamming" using all the higher cognitive structures pertaining (such as the analysis of the stimuli and neuroendocrine decoding of their context, study of possible response options, analysis of positive and negative consequences of every single reaction, modulation of a response based on context analysis, creativity, intuition) and sends back the objective decoding - "it is only the wind!" - to the amygdala. (*See Figure 2*)

However, while the correct information "it is only the wind" makes its way back, the amygdala has already started up all the alarm system sending hundreds of pieces of in-

formation denoting danger through the organism. This hazard information travels through the nerve pathways or the lymphatic system and uses neurotransmitters or hormones respectively as messengers. The prefrontal cortex loses its supremacy in the elaboration of a response to the environment, while much more primitive circuits of emotional reaction and archaic modalities mediated by the amygdala and striatum are strengthened: and the paradox is that while this restructuring can save our lives when we are in danger and a rapid reaction managed by reflexes and habits is required, it is compromising when more organized and elaborated solutions are needed, as in emergency situations for professionals. (*See Figure 3*)

As mentioned earlier, training has a fundamental value in the ability to respond effectively to both a startle response and a "surprise effect".

The difference between surprise and startle is that the former refers specifically to a cognitive mismatch between new information and expectations, while the latter is a more physiological reaction to a highly relevant stimulus. The startle effect can be defined as an uncontrollable, automatic reflex that is elicited by exposure to a sudden, intense event that violates a person's expectations. Although they very often occur together the two effects on the individual and his brain are distinct.

A startle might occur in the absence of surprise, for example when a stimulus is strong and frightening and unexpected but not unfamiliar or indecipherable (the door slammed by the wind or a sudden noise behind it).

Surprise similarly can occur in the absence of a startle, for example when an event occurs slowly and is not immediately dangerous. This is a very insidious condition for all the professionals whose lives this book deals with: they are trained to deal with emergency situations but they may suddenly find themselves facing a condition unintelligible, and to decode it they cannot use the usual categories in their possession.

While precious seconds pass the hippocampus works on a very rapid process of comparison with experiences already gone through, in order to facilitate the prefrontal cortex in the elaboration of an effective and decisive response. During the episode of surprise, the person continues to look at the situation that is unfolding before his or her eyes without really being able to make sense of what he or she is seeing. This inability to decode the environment leads to major delays in reaction, problem solving and decision making. Many aviation accidents have had as a factor the surprise effect in professionals, which has prevented them from using the most evolved spheres of the brain to collect all the information and signals of the environment and decode the situation, and from analysing the possible options with the pros and cons, and find the best response for solving the emergency.

The hippocampal system as we have said has the function to compare what is happening with the expectation based on previous experiences, and when there is a discrepancy, this function becomes predominant and absorbs all cognitive energies: at the brain level there is a behavioural inhibition, and decision making becomes very difficult.

All attention is directed on a hypervigilant scanning of the environment to find threatening elements, but without being able to decode them properly. Anxiety emerges as a

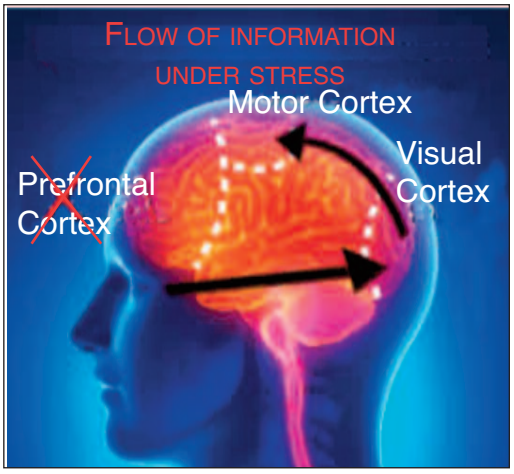

Figure 4 Flow of information in high stress conditions

perceived emotion: in this condition the prefrontal cortex, location of the most sophisticated response processing mechanisms, is turned off by the limbic system that takes over. (*See Figure 4*)
The effects of the startle are equally deleterious on information processing, and the person may appear frozen while trying to compare what they are witnessing with what they have already experienced in order to derive an indication for action: this process can last up to 30 seconds. They can seriously impair situational awareness, decision making and problem solving, all of which are strategic or fundamental skills in managing a complex emergency.

2.1.3 EFFECTS OF A CRITICAL EVENT ON A PROFESSIONAL

Both for its physiological substrate and for its psychological implications, the reaction to the stressful event determines in the organism a varied symptomatology that is distributed in a subtle but significant way on four areas: physical, cognitive, emotional, behavioural.
The experience of generalized malaise that is experienced in the days following a critical event composes a syndrome called Acute Stress disorder: it is due to the massive overproduction of hormones that is generated automatically and immediately in the body in front of the perceived threat.
A series of hormones and neurotransmitters, managed with a negative feedback circuit by the "stress hormone", the Cortisol, modify the activity of the organism in the moment of exposure to a critical event: the main functions are intensified to the detriment of the secondary ones.
As we have written, even if this change in the management of the nervous system has as its goal the survival of the organism, paradoxically it poisons it.
The sympathetic nervous system activates a whole series of hormones that dilate the pupil and the lungs and inhibit digestive activity and all secondary functions, while increasing bronchial muscles and blood pressure and releasing more glucose into the bloodstream to allow the brain to receive more oxygen and think faster and more clearly. The body's baseline temperature rises and the person has a reduced perception of fatigue, pain, muscular hyper-reactivity and heightened sensitivity to external and internal stimuli.
This neurophysiological activation instantly transforms the exposed organism so that it is armoured to respond more effectively to the challenge of the environment. But the