FUNCTIONAL ORGANIZATION OF THE NERVOUS SYSTEM

IMAGERY AND INTENTION

Imagery is defined as the mental picture or other construct created by drawing from past memories or experiences. The **image** can be a recreation of things past or new creation drawn from the same sources.

Intention is a determination to do or act in a certain way.The mind has a focus and clarity of purpose and a corresponding resolve to see the process through to it's conclusion.Intention is strongly linked to the Limbic structures.

Imagination utilizes multiple brain systems in creating it's pictures, stories and actions. The several senses drawn from include the visual-auditory (including internal speech), the kinesthetic (movement in time)and spatial(a three dimensional construct) will be utilized in the mental creation or recreation of an act or action. The more of the senses that are used in creating the image or action, the higher the definition of the image. *Any task that is familiar can be retrieved, recreated or rehearsed in the imagination. Not only can an action be rehearsed, it can be changed and/or fine tuned using the machinery of imagination.*

Even a task not previously performed, can be performed mentally to the degree that one can create new constructs from an adequate repository of experiences, motor patterns and supportive organizations.

The **imagination** uses the same neural structures to create the mental task as would be used if the task were actually being accomplished with the exception that the final motor activity is largely inhibited. Thus, in the quest to improve a given skill or motor performance, the imagination can be intentionally and skillfully used to act on that desire. Moreover, improvement may occur with surprising ease, for the imagined action is practiced largely free of unnecessary muscular tonus or superfluous muscular organization. When motor function is practiced in the imagination by a person lying down and in a relaxed and lighthearted mood, the general muscular tonus can fall near to it's resting baseline.This relaxed and pleasant state can greatly facilitate the clarity of imagined experience.

The brain wave electrical patterns of neural activity that are seen leading to the performance of an action are nearly identical to the pattern seen in imagining the performance or the task. The same temporal and spatial relationship exists.

The neural events of **intention** can be visualized using Positron Emission Tomography(PET). On a visual screen, the areas of the brain that are most active can be observed in various colors and intensity. Activities which require focused attention cause an intense cortical activity as do new or novel actions. When an **intention** is generated, the pre-motor regions light up brightly. As the action is repeated and becomes familiar, the pre-motor and motor zones quiet and the deeper extrapyramidal brain areas become predominant.As the activity becomes learned, the responsibility for performance reverts to deeper brain structures.The experience of **effortless action** is often experienced when a clear intention is acted upon and directed by our "non-volitional" sensory-motor system.In athletes and musicians, this state of being is termed being in the "**flow**". *Trying hard* to be in the "flow" usually results in not being able get into that special space.

PET also demonstrates that if you are attending to an activity in which you have skills (a musician listening to music), the left brain is dominant. If you are an unskilled listener, however, the right brain is dominantly involved.

Studies of children learning new tasks show that they often utilize multiple discreet areas of the sensory-motor cortex during the initial phases of learning. For instance, while drawing a picture, the child may move the lips and the tongue, assume certain body postures and do certain extremity movements.All of these activities can become part of learning a specific motor skill even when these accessory activities are fundamentally unrelated to the skill being practiced. As the primary skill becomes learned, these accessory cortical areas become less active and eventually become actively inhibited (although incompletely so in some people such as Michael Jordan who frequently protrudes his tongue as he elevates to the basket).

The PET confirms that the children (more than adults) do use multiple sensory and motor associations during the initial phases of creating a skill. The planned, intentional use of multiple sensory-motor linkages in somatic learning process was used by **Moshe** as he developed ATM® and FI® motoric activity.