

FEEL...THAT YOU ARE LEARNING: THE SELF-CONSCIOUS LEARNING

From Jon Olson, the all-time freestyle champion who decided to participate to the next Olympics in Giant Slalom. Without training he placed 60th in the absolute ranking. In an article on the magazine "Race" of November 2010 he wrote: *"when you go to the glaciers you see this multitude of training gates, with athletes who continue to spin up and down the ski lifts like tops, almost without thinking about what they are doing. It is the trainer's task to tell them what is right and what is wrong about their skiing. However the important thing is the feeling of the athlete, something impossible for the trainer to perceive."*

THE DIDACTIC PROPOSAL THAT THE SIAS (SKI INSTRUCTOR ASSOCIATION SAN MARINO) STAFF PRESENTS TO YOU TODAY IS A SPECIFIC PART OF A CYCLE OF LESSONS WHICH POINTS TO VARIOUS OBJECTIVES (INVOLVE THE PUPIL, GRATIFY HIS\HERS INTERESTS, FACILITATE THE LEARNING IN A CREATIVE AND VARIED WAY, ENTERTAIN AND FACILITATE, MAKE THEM AWARE OF THEIR MOVEMENTS AND THEIR SIGNIFICANCE). WITHIN THIS THEME, THE PART PRESENTED TODAY IS MAYBE THE LESS ENTERTAINING AS THE INTROSPECTION NECESSITATES A MOMENT OF HIGH ATTENTION, SO IT WILL BE THE TEACHER'S\INSTRUCTOR'S JOB TO UNDERSTAND THE MOMENT TO VARY AND CHANGE OBJECTIVES IN ORDER TO AVOID AN EXCESSIVE MENTAL EXHAUSTION OF THE PUPILS.

We basically asked ourselves:

Does emulation-based learning reduce the student's mental potential?

Yes as it values closed answers, it is a converging method, therefore without doubt deductive.

Is it conditioning?

Yes because it only imposes models, it does not develop the skills, it does not involve the pupil as an actor.

Therefore we tried to move towards a model of learning which involves the pupil to perform as much as possible as an actor and a sensory subject. To achieve this we have had to try to understand how the conscious perception of the "proprioceptive" information, which regulate the organization and control of the movements, works.

The scientific basic question is: "How does the conscious perception of the movements of the body work? Meanwhile the more easy-going question that should be posed to the pupil and to ourselves here today is: "What do you feel of your body when you are skiing? What do you value? What do you need that for?"

Above all, there exists a phase which merely involves **MYOTATIC REFLEXES**.

In the muscle there are sensors, the muscular spindles, which detect the stretching-shortening and the tension of the fibres.

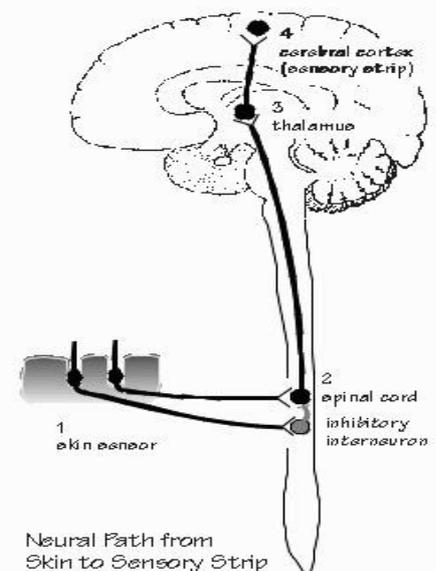
As a first step, this information does not reach the brain, but the spinal cord, which revises the data received.

If the information is in line with its parameters, the spinal cord does not intervene.

If the information is not in line with its parameters, the spinal cord intervenes, sending negative feedback to restore balance.

This action is called stretch (myotatic) reflex.

The sensors are not only found in the muscles, but also in the skin, in the articulations and joints, they for example detect the pressure points under our feet. They send information about how our body is positioned-leaned in space. Furthermore some of this information creates reflexes which aid movement. A typical example is that the pressure under one foot releases the muscles of the opposite forearm to ease the walk. These "proprioceptive" information and the relative reactions are involuntary (automatic),



they are automatisms.

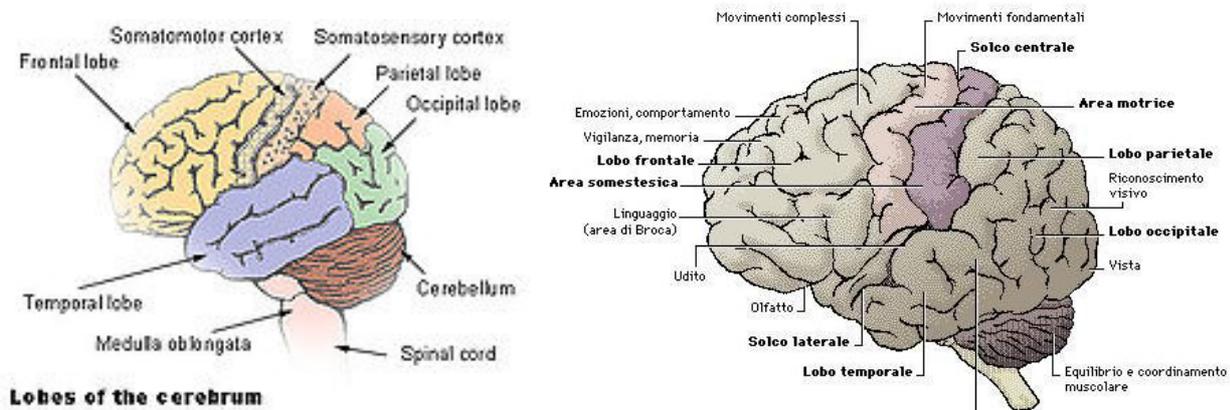
This piece of information then climbs up along the two ascending routes which run through the spinal cord all the way to the brainstem, and then converges and integrate in the THALAMUS and in the CEREBELLUM.

In these **SUBCONSCIOUS AREAS** of the brain the information is analyzed before it is passed to the sensitive areas of the cerebral cortex and merged/integrated with the visual information of the vestibular apparatus.

The sensorial information can be SPECIFIC: as for example the pressure under the foot, or the position of a limb in space. The THALAMUS analyzes this information and, based on the situation of the moment and the requests put forward by the mind, sends these both to the centers which regulate the subconscious and automatic movements (cerebellum, basal ganglia ect.), and to the sensorial centers of the cortex, which can transform this sensorial information into conscious and comprehensible messages for the mind.

The sensorial information can also be NON-SPECIFIC, and in this case it essentially comes from the RETICULAR FORMATION, a diffused network of neurons that sorts out the majority of the information that originates in the spinal cord, but most importantly it can modify the activity of the THALAMUS and of the SENSORIAL CORTEX through the excitement or inhibition of these areas. The reticular formation constitutes the system of connection between the base-camp of our emotions (HYPOTHALAMUS and LIMBIC SYSTEM) and the BASAL GANGLIA which, on one side control the repetitive movements that, once learnt, become automatic and do not necessitate conscious control, and on the other, are essential for the planning and programming of motor commands (see research on Parkinson's disease).

For example we can think about when we walk on a field with high grass. Usually our foot, while walking, lifts only of a few degrees. When in high grass, the foot, without us having to think about it, lifts more, because "we know" we could find greater resistance. The same happens when walking on a plane or up\down the stairs...



This said and once learnt to react to the external stimuli which could bring us to lose balance and fall, we can be guided by an external figure, the instructor: "you were leaning forwards, backwards..", or we can transfer available information even higher, to the brain, within the BODY SCHEME that we have of ourselves in our brain. (actually is the brain that has it, even better, doctors/scientists decided we have it...the homunculus!!!:-))

We therefore pass over to the **CONSCIOUS CIRCUIT**: from the thalamus the information goes back up towards the cerebral cortex:

On a 1st level (NUCLEAR CONSCIOUSNESS) the specific sensorial information arrives to the body map of ourselves which we have represented in the primary cortex (CORPOREAL SCHEME\HOMUNCULUS). We understand what happens, for example we classify the pressure on the entire foot (and not only on the tip or the heel) and interpret it as sense of balance. On a 2nd level (EXTENDED CONSCIOUSNESS) the specific and non-specific sensorial information consent the full awareness of the lived past and of the predictable future of our movement and actions. Therefore we not only understand what is happening, but comparing

it with the data base we have, we can plan different movements in different moments; this way, in simpler terms, we correct ourselves. We can therefore behave like a child starting to experiment the difference between left and right and, once understood the basic concept, we can plan and complete planned tasks and movements all temporally contextualized.

LEVELS OF CONSCIOUSNESS\AWARENESS

When the sensory information reaches the SOMATOSENSORY CORTEX and specifically the PRIMARY AREA of the cerebral cortex, it integrates with the sensory representations of the areas in the body (homunculus). It should be noted how lips, tongue and hands have a vast area of representation and are therefore particularly designed for the collection of big amounts of sensorial information (have more afferent neurons, i.e. can collect/register higher amounts of info), while the hips for example have a smaller sensorial area. In this cerebral area the IMAGE OF THE SELF or corporeal scheme develops and consolidates.



At the back of the somatosensory cortex is the SENSORY ASSOCIATION CORTEX, where integration of primary sensations, to which the mind attributes a particular meaning, occurs.

We could therefore define two levels of consciousness:

1. Nuclear consciousness which provides a generic sense of self, linked to that particular moment (here and now), a biological level without significance in time. This level of consciousness generally corresponds, in psychology, to the first step of Maslow's ladder (the survival, the primary and essential needs: I don't know why I am here, but all I care about is being here without too many questions);
2. Extended consciousness which provides and elaborates the sense of the self, with the full awareness of the lived past and the predictable future, with a profound knowledge of the surrounding world. In psychology, citing Maslow's ladder of needs, we get here out of the sphere of the five fundamental needs, flowing into a limbo where the necessities go beyond the mere needs of social confrontation.

To then give some guidelines on which to act upon, we have to consider that the awareness of our own movements develops on three levels, which integrate and enrich one another. In the initial level of learning they should be taken into consideration in an analytic manner:

1. The corporeal level: what is the dominant posture, what movements do I think I am performing, which muscles do I feel working, which have useless tensions, where do I localize important pressure points.
2. The temporal level: how long does a movement last, when does it occur in the phase of a turn, to which other movements is it connected (sequence and contemporaneity\duration).
3. Spatial level: how wide or short movements are, on which corporeal axis they occur in, how do I occupy the slope space (width and depth of the turns), how do I perceive the plane and the steep in each turn (search to be perpendicular in respect to the skis).

What occurs (and what we wanted to describe) is, in extreme synthesis, this:

- At the beginning, the movement is voluntary, self imposed and controlled. It comes from the cerebral cortex (i.e. from there comes the command of what the body has to do),
- If I listen to the feedback received by my body, I manage to make a comparison between the desired action and the actual one,
- This reorganizes the movements and corrects them,
- With a certain number of conscious repetitions and self-listening the cerebral control loses its grasp,

- And the movements become controlled by the cerebellum, they become automatism, entering the warehouse of the acquired motor experiences.

Substantially when we are beginners we take care of the dip and the ice that we find on the slope (under our feet). When we are in the World cup we pay attention to where the gates ahead of us are, while automatism alone is left determining our skiing (our adaptation to the slope).

How can the ski instructor work so that the pupil reaches that kind of learning?

And even more so, can the sport learning that utilizes awareness of the proprioceptive information be called "intelligent"?

We maintain the answer to be yes, because, differently from the learning through conditioning (10.000 guided, but deaf, repetitions of the same movement, in which the instructor tells us what to do and whether we succeeded or not), the conscious learning provides open answers and uses a divergent and inductive method which stimulates thought and discovery.

On a same technical content the pupil discovers the richness and variety of his\hers own answers and he\she realizes that the perceptive elaboration consents to enlighten (or to make non-deaf) the body, discovering answers that create surprise. If this process is activated, the pupil will find a renewed interest in learning, which tends to renew itself step by step. It happens because, from being subjected to the instructor, he\she passes to a real dialogue, founded on the self, discovering to possess personal ideas and opinions to compare, value and modify.

When the motivation of the pupil for the skiing lessons extinguishes (the boy who becomes an adult and often quits the lessons), generally we assist to this mechanism: "I understand, I know what I do wrong, but the instructor keeps on pointing out the same mistakes and, even if he shows and explains to me the exercise a thousand times, nothing changes". At this point the dependence on the external (observing) figure leaves space to dissatisfactions, that don't always stop by changing instructor.

The conscious perception of our own body which moves in space and time enables us to activate and train the internal observer that exists inside every pupil, helping the instructor to better investigate the marvellous world of causes limiting the learning, or the execution of a high level, complex action that is skiing.

A lesson which takes in consideration the pupil's awareness of his\her own movements, or of his/her effective performance, is in fact a tie of different techniques, which enables to escape from an excessive dogmatism (conditioning) that furthers instead of drawing closer the learning of skiing.

Because it is through the perceptive work that we open the doors that enable us to access the self, the instructor has to try to reduce the conditioning effect of his\her communication and of the excess of didactic enthusiasm. It is important to avoid the pupil from giving non-sincere answers and try to only please the instructor, rather than discovering him\herself. To facilitate the path of learning and not to leave the pupil too "lost" in the search of the self, it is necessary to at least point out the main objectives of this didactic path. This will not always be linear, or it will not always follow a standard didactic progression, but will have a "spiral" adaptation, in which some contents are going to be reiterated at various levels of depth and with different perspectives and points of view.

In the activity in the field that will follow, we will try to have you test what we just now told you. Our didactic example will be organized this way.

Objectives: to become aware of the movements of the hips, in particular on the transversal and sagittal plane to optimize the muscular work.

Fundamental points of the didactic path:

1. Frequently use the hands in a resting position on the hips to facilitate taking oconsciousness of its actual movements, because the homunculus present in our minds (our ability to listen to ourselves) finds the hands a much more sensitive part than the hips.
2. Reduce the useless and excessive muscular tensions, for example using a circular respiration and finding an economic balance.
3. Perceive the position of the hips in respect to the feet and analyze the tension carried by the muscles of the thigh.
4. Feel the movements of the hips on a transversal plane and at the beginning of the curve in respect to the new trajectory, feel the difference between rotation impulse and passive rotation of the hips.
5. Feel the effects of the rotation impulse of the hips in favor of the new curve direction.
6. Deal with the rotational inertias, activating the adductors (internal muscles) and the abductors (external muscles) of the thigh to control the undertaking of the glean\edge.
7. Feel the balance of the hips on the sagittal plane (ant version = bottom forwards and retroversion = bottom backwards) to optimize the effectiveness of the action fulcrum on the hips and to obtain a closed kinetic chain between ski and hips.