



A sensorial approach.


**Let's talk together
about colours
and our seven senses**

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Seminario di aggiornamento "ESP & CLIL: friends, false friends or foes?"

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**First: let's
answer some
basic questions
about our
senses**

1st sketch: did my primary school teacher lie to me?

What do you know about human senses?
How many are them?

WRONG ANSWER: They are five, touch, taste, sound, smell, and sight...
(proprioception, equilibrium?)

How many are the fundamental tastes?

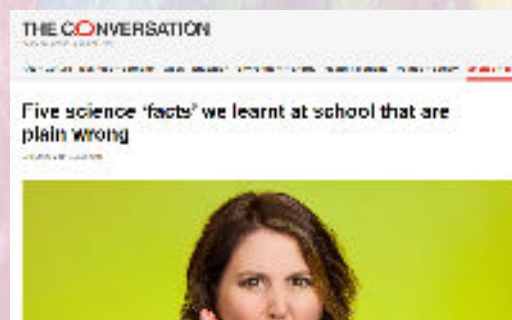
WRONG ANSWER: Of course they're four: sweet, sour, salty and bitter!...
(umami?)

What about the colours of a rainbow?

WRONG ANSWER: We all know that they're seven, red, orange, yellow, green, blue ...
ehm... ok, indigo, and violet!...
(they're countless, indigo is not a spectral colour, meaning of words has changed...)

Let's put aside the (in)famous *primary colours*!

Did my primary school teacher lie to me?



It is common that we recognize the existence of something at the same moment that we find a word to describe it.

It happens in each aspect of our lives.

Sensorial experience is a question of consciousness and words.

We are even *more or less* aware of our body's properties and behaviour, but actually we're mostly describing them with words we have been given, and if we've not been given...

words, words, words...

3 The Disembodied Lady

The aspects of things that are most important for us are hidden because of their simplicity and familiarity. (One is unable to notice something because it is always before one's eyes.) The real foundations of his enquiry do not strike a man at all.

—Wittgenstein

What Wittgenstein writes here, of epistemology, might apply to aspects of one's physiology and psychology—especially in regard to what Sherrington once called 'our secret sense, our sixth sense'—that continuous but unconscious sensory flow from the movable parts of our body (muscles, tendons, joints), by which their position and tone and motion are continually monitored and adjusted, but in a way which is hidden from us because it is automatic and unconscious.

Our other senses—the five senses—are open and obvious; but this—our hidden sense—had to be discovered, as it was, by Sherrington, in the 1890s.

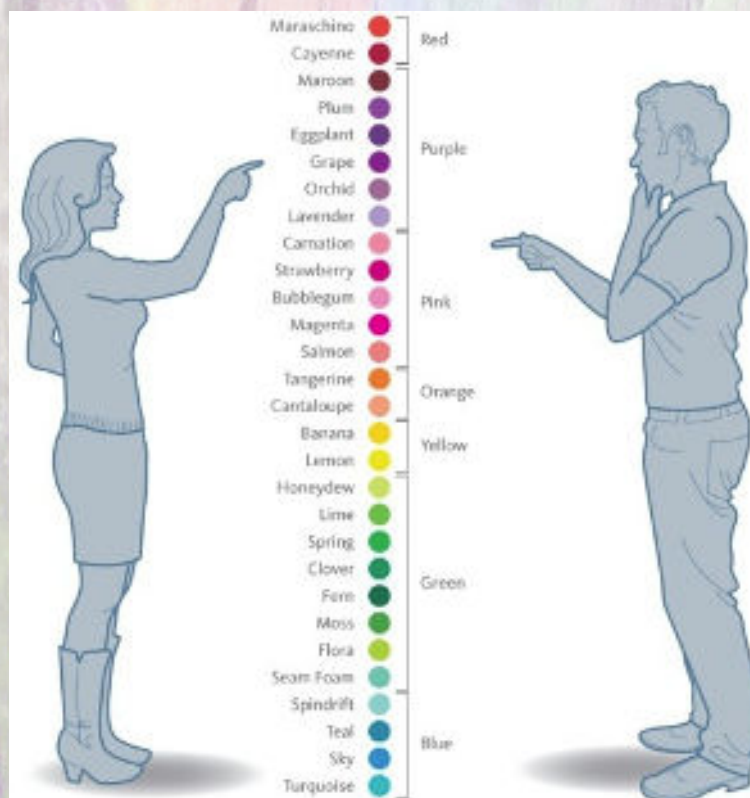
He **named** it '**proprioception**', to distinguish it from 'exteroception' and 'interoception', and, additionally, because of its indispensability for our sense of ourselves; for it is only by courtesy of proprioception, so to speak, that we feel our bodies as proper to us, as our 'property', as our own. (Sherrington 1906, 1940.)

Oliver Sacks: The Man Who Mistook His Wife for a Hat

Colour, the words about colour and their

often confused and misleading

meanings...

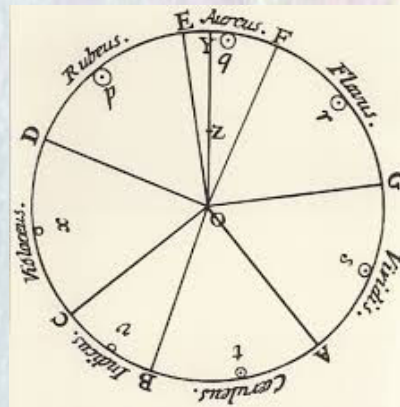


It is *not* true that women are more able than men to distinguish different colours (although colour vision anomalies are slightly more common in males): simply in most cultures women are more trained in using related words



But... who decided that the colours of the rainbow are ROYGBIV, and when, and why?

Hint: A famous alchemist, interested in mundane affairs, who liked the number 7 very much, and quite good also at mathematics and physics...



Two different forms of science communication, about the origin of the "seven colour mythology"

<https://www.youtube.com/watch?v=7i9Alry7Fis>

<https://www.youtube.com/watch?v=bf7WT6TLy8s>



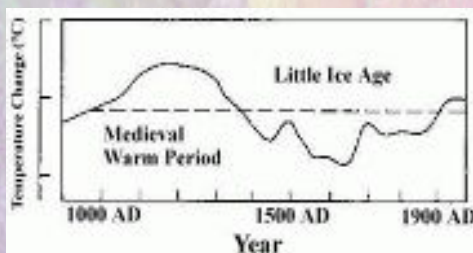
BOOK I 41
 when with deep violet. Which plainly shews, that the Lights of several Colours are more and more refrangible one than another, in this Order of their Colours, red, orange, yellow, green, blue, indigo, deep violet; and so proves as well the first Proposition as the second.

omnium. Ex quò clarissime apparet, Luminia variorum Colorum varia esse Refrangibilitate: Idq; eo ordine, ut Color rubeus omnium minime Refrangibilis sit, reliqui autem colores, aureus, flavus, viridis, caeruleus, indicus, violaceus, gradatim & ex ordine magis magisque Refrangibiles. Quo quidem tam prima Propositio, quam secunda, comprobatur.



There are some further considerations. Newton needed to use words which were easily associated to colours in common speak, but he had very few examples of really saturated colours like those in the spectrum. He lived in foggy and rainy southern England, in the middle of the Little Ice Age: not so many colours around...

It is clear that his *blue* was probably a cyan-aquamarine, and *indigo*, the last of seven, was possibly the only kind of common blue shade generally known in his area... but unfortunately it is really unsaturated, not-spectral !



Our imagination about images



Well before
Web fake news
and any misuse
of copyrighted
Images
people were used
to mix original ideas
and repaint them
with
their own fantasies

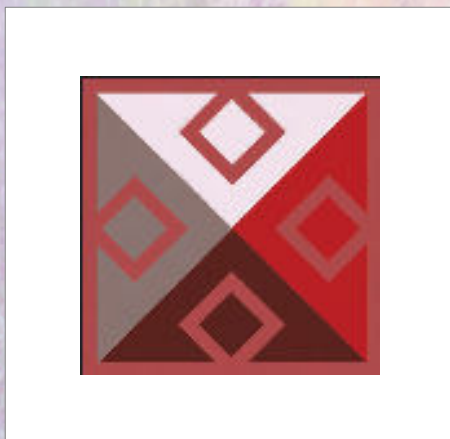


*And the worst
happens
with textbooks*

(of course, all colour simulations are wrong)

Two pictures taken from a paper that appears really interesting for CLIL work about colour. It deals with all aspects of the *words* and of their often conflicting meanings.

<http://jaic.jsitservices.co.uk/index.php/JAIC/article/download/39/35>



Then we can introduce other relevant issues
Natural indigo

Resources

Natural vs synthetic

Sustainability

... and what they really mean for real people

A real indigo cauldron”

<https://youtu.be/E1TdueSATpE>

The way natural indigo is extracted (if you like it!)

<https://youtu.be/UEMcjmyjoOY>

Even more organic” details!

<https://youtu.be/UEMcjmyjoOY?t=287>

Cochineal

https://youtu.be/lmoT6wJz_vU?t=102

The aim of this presentation was not to show
a really structured CLIL lesson,
but to introduce some of the procedures
that we tried at the *Setificio* of Como,
mostly at Sistema Moda courses,
to teach chemistry and CLIL in different ways...

2nd sketch: a classic of chemistry and literature

*Double, double toil and trouble;
Fire burn, and cauldron bubble!*



Indigo!