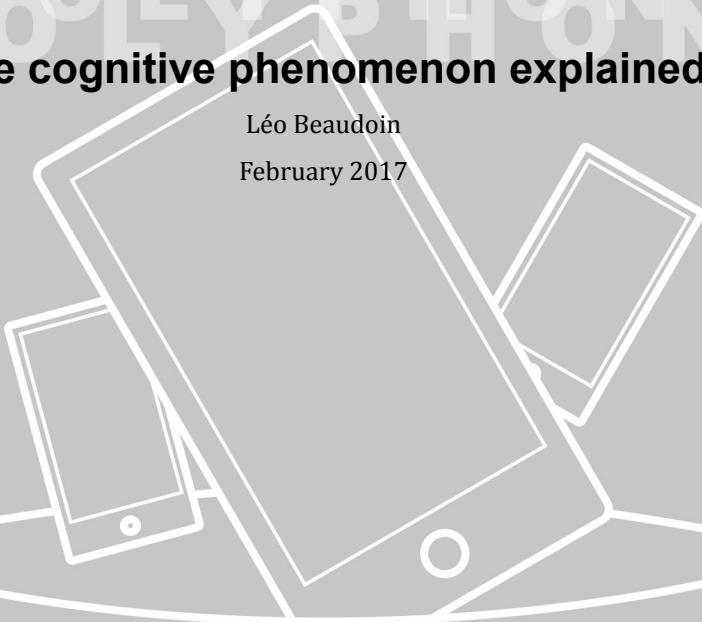


«POLYPHON»

The cognitive phenomenon explained

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February 2017



Intro

It is usually believed that a fully able human being experiences life via 5 senses. **Equilibrioception** is an often forgotten sense. Perceived by the inner ear, it is essential for balance and movement perception. Now, try this : close your eyes, and touch your nose with your index. We're going to assume you succeeded. Actually, most of the sober people who have both an index and a nose pass this test easily, thanks to

Proprioception. It is another commonly overlooked sense. It allows you to be aware of our body parts' locations. When deprived of it, people are unable to clap their hands with closed eyes. What we can all agree on, is that the 5 senses model is as widespread as it is outdated. Some go as far as saying that humans have 21 senses. The lowest number the scientist community seems to agree on is 9. Although fascinating, we won't explore the detail of these mechanisms. The important thing to acknowledge here, is that our bodies are much more complex than we usually assume. All this complexity is wired directly to our brains, that tries to make the best sense out all this input. Input, also known as stimuli. Nowadays, our eyes spend a lot of time glued to screens of different sizes, colours and brightness. They are more and more bound to our every day lives. Smart phones may have been the most ground breaking technology in the way it reshapes 3 things : how to experience the world, how to access and handle information, and how people interact with one another. The people experiencing this change at the fullest are those between 15 and 25 years old. This is no surprise that this age range is so prone to using screens, given that they had access to this technology as long as they can remember. These devices were not only available, but also numerous. In their households, with their friends, young people have had access to multiple portable devices every day. Hence the name of the phenomenon we're discussing today : Polyphon. Poly from the Greek "multiple" and Phon as a short for "Phones".

High amount of stimuli, and dissonance.

A lot of young people go as far as saying that their whole life is tucked in their portable devices, that these are a prolongation of their minds. They report feeling it vibrating in their pockets when they forgot it home, and actually feeling uneasy when this situation occurs. The relationship to mobile devices has become an easy target for controversy. What we'll focus on here, is that these circumstances drastically lowered the tolerance for boredom, and heightened the tolerance for sensitive overload (psychological state induced by the environment over-stimulating one or more of the senses). A study conducted by the university of Cambridge in 2015 showed that subjects in situation of boredom were willing to inflict themselves electrical shocks rather than experiencing boredom for more than 5 minutes. Before the test, subjects were instructed to touch an electric shock button. This experience was painful for every subject, and they reported never wanting to try it again. During the actual test, they were told to remain seated for 30 minutes, next to the electric shock button, in room with no distraction at all. They were given the freedom of experiencing the electric shock button again or not. Over 95% of the test subjects touched the button again. The demographic showing the shortest amount of time before they shocked themselves were subjects aged 18 to 25, with 73% of these decisions taken before 3 minutes had elapsed.

Psychotherapist Sophie Gloeckner reports an increase in sensory overloads with her patients aged over 25. However, the trend is going the other way for younger patients. "From a young age, people are unconsciously training their working memory when using technology such as smart phones, and playing video games. Their brains are becoming more and more wired to soaking information on the go, to focusing intensely in short burst, and seeing moving images all the time", she claims. "They rely on their devices to find accurate information, a task usually accomplished by long term memory, that tends to be nowadays more used to remembering how to access specific information. In a way, long term memory is slowly turning into a list of bookmarks".

The increasing use of virtual reality also lead to a higher tolerance for

sensory dissonance. Sensory dissonance is what happens when you get sick on a boat for example. If you are inside a cabin with no windows, on a troubled sea, your eyes will tell you that nothing is moving, but your inner ear will tell you otherwise. Your brain receives contradicting sensory information. This is a dissonance, and the brain has a really hard time solving this problem. As a result, you get sick. Same thing happens in virtual reality, the immersion in virtual 3D space is – as of today – only induced by the use of sight and sound, and sometimes movement recognition. But what happens if the view starts rotating without us rotating our heads? Or if it moves without our internal ear perceiving anything? Or if we see our limbs somewhere our proprioception tells us it's not? Sensory dissonance, the more the brain is exposed to it, the more it is likely to accept challenging contradictions and solve conflicts. MRIs show that the plasticity of the brain is better conserved with people who are used to solving these conflicts on a regular basis. Which means their neural paths can be rewired more easily.

How the brain reacts

The MIT has been studying the relationships and boundaries between new technologies and humans. Studies showed how a subject could confuse themselves with a plastic mannequin under certain circumstances. When wearing a virtual reality headset showing the point of view of the mannequin, and being touch in exactly the same areas of the body for a while, subjects freaked out and even reported feeling a brief moment of pain when the puppet was hit with a hammer, before they realised they didn't get hit themselves. This shows the power of immersion of virtual reality. The constant flow of information soaking our brains, as well as the increasing use of virtual reality, starts to change some of our abilities. A comparison between a series of tests conducted in 2001 and in 2016 showed :

Shorter reaction time, faster analysis of situations and better performances at problem solving. This shows the change in the way we experience the world. As for the way we interact with others, people use more text to communicate, which poses the following questions : how should we interpret something without the body language? Or the tone of a voice? The use of images (emojis and GIFs) is a wide spread solution to these problems. It has even become what could be considered a language, with memes and emoji combinations. A team at the MIT studied the mirror neurons, the part of the brain mostly responsible for empathy. Without it, humans wouldn't be able to step in other people's shoes. The subjects tested were people who used texting on a regular basis, and the control group was made up of people who didn't use that so much. When put in a situation of empathy the MRI scans showed a higher response in this area of the brain on the subjects that used texting on a regular basis, as opposed to the control group. How ironic is that, that people actually build more empathy by using a device so often denigrated as "social contact cutter"?

A deeper level of understanding?

This “new design” of brain has proven to be better at analysing situations quickly, and a greater capacity for having empathy. And the results of the next study are astonishing. Subjects that showed abilities listed above were put in a conversation with a blind person. This person was carefully chosen to be blind from birth. The control group comprised people who showed normal levels of empathy and were given the same task as the previous subjects : they were assigned a colour, and given 1 minute to describe it to the blind person, without using obvious key words that were also listed (e.g Lemon or sun for yellow). The instruction was to describe how they experienced the colour, more than what meaning is usually related to it. The rate of success in this group of people was 47% higher than in the control group. Subjects were able to put together words that helped the blind person have a better understanding of what they never experienced. Of course, the blind person had to relate to the understanding they had of colour. By listening to the subjects, they didn't experience the sight of the colour per say. But these results show that we are getting one step closer to sharing experiences to a deeper level of understanding. Researchers are currently working with Polyphonable people, exploring how far this phenomenon can go. Maybe a chain of word carefully chosen, and put in the right order could trigger the listener's brain to experience what it is to see from the speaker's point of view. Maybe our consciousness are more porous than we first assumed.

This is a ground breaking change that could drastically modify the way we teach and live together. It also raises the ethical question of manipulation. If you can make people feel a certain way, just by having them listening to words, what is keeping you from forcing people to buy your product? Or even further, to commit crimes or suicide? These questions are asked far ahead, but researchers already have them in mind, and won't be able to reply until they know more about the extent of this phenomenon.