Communicating Science through Metaphor

Poetry is metaphor, science just uses it. We might also say: and nothing less.

Ortega y Gasset, philosopher

For centuries, metaphor has been considered a rhetorical resource restricted to the world of poetry. Outside this world, the scientific community treated it as an inconvenient guest and moved it away from the academic literature. Scientific discourse had to use a precise language, without emotion and faithful to reality.

However, attitudes towards metaphor have drastically changed after the recognition of its ability to introduce creative and didactic ingredients into scientific language. Effective communication of science requires a kind of translation. From Charles Darwin to Stephen Hawking, scientific community has realized that one of the best ways to perform such translation is through metaphor.

- **WORDS WITHOUT COMPLEXES**
As indicated by Greek etymology, metaphor means “transference” and leads us further beyond the boundaries of a word. By the use of one word instead of another, it allows us to transform abstract scientific ideas in particular concepts through comparison.

By nature, men tend to conceive the world via association of ideas. The mind has an insatiable appetite for concrete images. Metaphor has revealed itself as a basic mechanism in the assimilation of experience, in the formation of concepts and in the articulation of knowledge. Under any concept, a metaphor beats.

- **THE POWER OF METAPHOR**
- It communicates and spreads in everybody’s language what was conceived by a few scientists. ✨Greenhouse effect
- It makes the understanding of abstract ideas easier by providing more specific and closer concepts, especially when science refers to areas beyond human experience. ✨Black hole, Dark matter
- It suggests and explores unexpected sides of reality. It is an invitation to continue the game initiated by the scientist. It opens the gate to new dimensions and hypothesis. ✨Particles are billiard balls
- It gives color to the language of science. It beautifies and gives pleasure to mind, so that its flash of beauty makes it aesthetically attractive. ✨A supernova is the swan song of a giant star
- It has a heuristic function: metaphor can even predict future phenomena. ✨Iceberg economy

- **HOW TO CREATE IT?**
Fundamental science has suffered several vocabulary crises when explaining to non-specialist audience phenomena that are beyond their direct experience. Metaphor remains a very reliable tool, a valuable ally that adds creativity. When the researcher forms a new concept, he or she needs to give it a name. Like all writers, a researcher works with the language and can also write poetry when it’s time to communicate.
To create a metaphor, think in terms of analogies. To make yourself understood, you can dress it with a word whose meaning usually has some resemblance. The easiest way to do it is by grabbing words and expressions from everyday language. 

Antigens and antibodies match together like a key and a lock system.

You can always recover words from ancient language, even from myths or legends, and that will give your metaphor some poetry. 

Gaia theory

Also pay attention to your close environment, looking for daily events that could give you a good key to compare. 

Information superhighway

Don’t underestimate your imagination and don’t be afraid to create a completely new word! Awarded with the Nobel Prize, scientist Gell-Mann baptized a promising element in particle physics after the sound made by ducks: quark. He found it in a Joyce’s book. Nowadays we even have six types of this fundamental constituent of matter with exotic names: up, down, charm, strange, top and bottom.

The scientist Richard Dawkins also introduced the new word meme to describe a unit of human cultural transmission. Similar to the gene’s evolutionary principles, it promoted the discussion about how ideas and cultural phenomena spread.

- **HOW TO USE IT?**

The most sensible way to use a metaphor is by making the most of its communicative potential. Try to repeat it in the appropriate context, letting it be as creative and adventurous as possible. Playing with it could lead you to continue the metaphoric game with other expressions and to open new perspectives for the audience.

The mind is a computer; Internet is a collective nervous system

Bear in mind that if it is successful, it will be spread through society and perpetuated in academic circles. Who doesn’t know nowadays what the butterfly effect, the selfish gene or a wormhole in space-time are?

There is a close relation between metaphor and image. In fact, a metaphor is a mental picture. Take advantage of the visual side of your metaphor.

- **THE DANGER IN IT**

The power of metaphors must nevertheless be taken with caution. It could trick one's mind into taking metaphors too literally, thereby creating problems that do not actually reflect the reality of the natural world. Language games can lead the public to construct their own warped understanding of it. The problem is that these misunderstandings can be perpetuated and become fossilized. Its widespread use can blow up the strength of scientific discourse. While some concepts could be enlightened, others may remain in the shadows.

The Ozon Hole is not a hole, the Big Bang didn’t have any sound in it because of the lack of atmosphere and genetic fingerprinting just gives us probabilities, no certainties.

The danger of visual metaphors is that they are never temporary images. Once learned, it is difficult to remove them from the mind and they tend to remain unchanged. We run the risk of waking up one day in a world where time is a chewing gum and where a God spends time playing dices...

Nadiejda Vicente, PhD journalist on Space Information