Photo: Freepik

# NOT JUST WORDS

## HOW THE BRAIN SHAPES COMMUNICATION

**In the common understanding, we tend to equate communication with language: speaking, writing, and exchanging information. However, neurobiology shows that this is only the most visible layer of a much deeper process.**

Olimpia Orządała

Marek Kaczmarzyk, PhD, Assoc. Prof.
Institute of Biology, Biotechnology
and Environmental Protection
Faculty of Natural Sciences
University of Silesia in Katowice
marek.kaczmarzyk@us.edu.pl

Although it may not seem that way, language is not a human invention. Many animal species have the ability to convey information. Humans use language in quite a unique way – they can construct complex narratives, refer to other people's thoughts, and predict their intentions. And even though these abilities are not found in other species, this does not mean that communication begins with language. The language we know is really just the tip of the iceberg of communication.


## BEFORE LANGUAGE

Paleoanthropological and neurobiological research indicates that language did not appear as a result of a single and sudden event. Its development was gradual and based on earlier communication mechanisms present in animals.

'From an evolutionary perspective, it would be fair to say that emotional and relational communication came first, and only then did our hyper-social species create the language we know now', says Marek Kaczmarzyk, PhD, Associate Professor, a neurobiologist from the Faculty of Natural Sciences of the University of Silesia in Katowice.

This reversal of perspective is significant: it means that communication problems do not result solely from the choice of words but from deeper mechanisms, including biological ones. Attempts to 'fix' communication through better word choice or argumentation are limited. If the emotional and relational foundation is disturbed, language ceases to function as a means of communication and becomes a tool of defence or attack. Therefore, neurobiological perspective on the matter suggests that effective communication begins not with the form of expression but with the state of the relationship between the interlocutors.

## NO COMMUNICATION WITHOUT EMOTION

There is no such thing as a message completely devoid of emotion. Even the most abstract statement, e.g. mathematical, scientific or technical, takes place in a specific emotional atmosphere that influences the way it is received.

'Even when a mathematician describes algebraic procedures, they do so in a certain emotional atmosphere, and this atmosphere influences how we come to understand them', admits the scientist.

The meaning of a message also depends on the recipient's past experiences. The same message can elicit completely different reactions depending on previous emotional experiences. The seemingly neutral sentence, 'Let's go home', can be interpreted in many different ways. One person will associate it with safety and peace of mind, another with control and punishment. The difference lies in the emotional baggage that accompanied similar situations in the recipient's past.

## WHY OUR MEMORIES DIFFER

From a neurobiological perspective, conflicts arising from differences in memories are particularly interesting. We often talk about the unreliability of our own and other people's memories in times of anxiety. When two people remember the same event differently, we may interpret this as a lack of commitment or indifference. Meanwhile, memory mechanisms work exactly in the opposite way: it is precisely the memories that are often recalled, analysed, and placed in new contexts that undergo the greatest modifications.

'We don't have brains, we are brains. If we adopt this perspective, the concept of memory deception seems to be no longer valid' says the researcher.

Memory does not store events in an unchanged form. Each time we remember something, the brain re-enters a state similar to the one from the moment when the memory was created, but modified by subsequent experiences. Representations of memories in the brain partially overlap. When we recall a memory, we also modify other neural structures associated with it.

'A memory that has been frequently recalled in different contexts changes more than one that has been left untouched', says Marek Kaczmarzyk.

From this perspective, differences in memory are not evidence of uncaring or disregard but often the exact opposite – an intense experience.

'Memory is not used to faithfully record the past, but to enable us to function in the here and now', emphasises the scientist.

The variability of memories is an adaptive feature, not a defect of the human mind. The plasticity of memory also has a protective function. In the case of a traumatic experience, it allows for the gradual weakening of destructive emotional reaction while retaining knowledge of the event.

'The same memory processes that irritate us are sometimes the ones that allow us to survive', admits the neurobiologist.

## TOO MUCH AT ONCE

The human brain is not biologically adapted to the pace of contemporary cultural change. Evolution, always reacts with a delay.

'The problem is not that too much information reaches the brain, but that there is too much pieces of information to choose from and that they are inconsistent with each other', says the scientist.

Organising the world is not about imposing a single point of view but about showing that consistency is possible. An inconsistent picture of the world leads to a sense of threat and confusion, especially in young people.

'Young people are eager to observe adults who act coherently and have their internal world in order', says the researcher.

Importantly, the brain is not a passive recipient of stimuli. At the level of sensory physiology, most information is filtered out before it reaches conscious processing. Working memory – the process responsible for thinking – also has a very limited capacity. This means that the problem of the modern world is not biological 'overload' but rather the difficulty of organising an excess of inconsistent messages.

## CONTAGIOUS EMOTIONS

Mirror mechanisms cause other people's emotions to trigger analogous states in our brains, but their interpretation depends on our personal experiences.

'How we perceive the emotions of others depends more on who we are and what we have experienced in the past than on what we are witnessing', says Marek Kaczmarzyk.

These mechanisms also explain why emotions can escalate so easily. Contact with an upset person triggers similar states in our brains, even if we did not originally feel those emotions. As a result, the conversation quickly ceases to be an exchange of information and becomes a confrontation of emotions that reinforce each other.

In a world full of tension, the ability to recognise and name emotions becomes a key competence. In such conditions, rational arguments lose their effectiveness because they are filtered by the current emotional state. When threatened, the brain switches to quick defensive reactions rather than analysing the content of the message. This is one of the reasons why conversations get out of hand in tense situations – not because we lack arguments, but because emotions take over control in the communication.

From a neurobiological point of view, this is not a system error, but its fundamental function. Emotions act as a rapid regulatory mechanism – they inform the body about the significance of a situation and prepare it for action. Only then is it possible to activate a more reflective and analytical mode of thinking. The problem arises when we are trying to conduct a rational discussion while the other person is still functioning in the mode of emotional mobilisation.

'There are no bad emotions. Emotions exist to tell us something about the world and our relationship with it. They are not the opposite of reason, but one of the tools the brain uses to make decisions', says the neurobiologist.

Communication problems begin when emotions disrupt dialogue instead of supporting it, most often because we are unable to separate them from the problem itself.

A neurobiological view of communication does not justify tensions or misunderstandings, but it does allow us to understand them better. In a world full of anxiety, the awareness of biological mechanisms and their limitations can be the first step towards more attentive and calmer communication – both with others and with ourselves. Neurobiology does not provide simple recipes for better communication, but it does provide a framework that allows us to realistically assess its limitations and possibilities. Much of the tension in communication is not a sign of a 'crisis of humanity', but rather the result of biological mechanisms colliding with the pace of the modern world.