



Egon Gál

On the mystery of human consciousness

Philosophers and natural scientists regularly dismiss consciousness as irrelevant. However, even its critics agree that consciousness is less a problem than a mystery. One way into the mystery is through an understanding of autism.

It started with a letter from Michaela Martinková:

Dear Egon Gál,

Our eldest son, aged almost eight, has Asperger's Syndrome (AS). It is a diagnosis that falls into the autistic spectrum, but his IQ is very much above average. In an effort to find out how he thinks, I decided that I must find out how we think, and so I read into the cognitive sciences and epistemology. I found what I needed there, although I have an intense feeling that precisely the way of thinking of such people as our son is missing from the mosaic of these sciences. And I think that this missing piece could rearrange the whole mosaic.

In the book *Philosophy and the Cognitive Sciences*,¹ you write, among other things: "Actually the only handicap so far observed in these children (with autism and AS) is that they cannot use human psychology. They cannot postulate intentional states in their own minds and in the minds of other people." I think that deeper knowledge of autism, and especially of Asperger's Syndrome as its version found in people with higher IQ in the framework of autism, could be immensely enriching for the cognitive sciences. I am convinced that these people think in an entirely different way from us.²

Why the present interest in autism? It is generally known that some people whose diagnosis falls under Asperger's Syndrome, namely people with Asperger's Syndrome and high-functional autism, show a remarkable combination of highly above-average intelligence and well below-average social ability. The causes of this peculiarity, although far from being sufficiently clarified, are usually explained by reduced ability in the areas of verbal communication and empathy, which form the basis of social intelligence.

And why consciousness? Many people think today that, if we are to better understand ourselves and our relationships to the world and other people, the last problem we must solve is consciousness. Many others think that if we

understand the brain, its structure, and its functioning, consciousness will cease to be a problem. The more critical supporters of both views agree on one thing: consciousness is not a problem, it is more a mystery. If a problem is something about which we formulate a question, to which it is possible to seek a reasonable answer, then consciousness is a mystery, because it is still not possible to formulate a question which could be answered in a way that could be verified or refuted by the normal methods of science. Perhaps the psychiatrist Daniel M. Wegner best grasped the present state of knowledge with the statement: "All human experience states that we consciously control our actions, but all theories are against this."³ In spite of all the unclearness and disputes about what consciousness is and how it works, the view has begun to prevail in recent years that language and consciousness are the link that makes a group of individuals into a community.

Some words about autism

Autism is usually defined as a sort of "cognitive solitude". Simon Baron-Cohen defines autism as a breakdown of empathy or "mindblindness": "People with autism have problems with 'reading the minds of others', they cannot place themselves in the skin of another person, they cannot imagine what other people feel, what the world looks like through their eyes".⁴ "I only say what I think", said one adult man with Asperger's Syndrome to Baron-Cohen. "How others perceive it means nothing to me. How something affects them or offends them is not my affair. I only express my view. Where my words fall has nothing to do with me. It is like when I use the toilet. Once the excrement has left my body, I am not responsible for what happens to it." Another autistic person replied to the question of what he feels when he sees somebody weep, that he had learned to ask the person: "Would you like a cut of tea?" and added: "If you don't feel, then pretend."

In an outstanding study, *An anthropologist on Mars*, Oliver Sacks⁵ writes of how Temple Grandin, an autistic person and scientific researcher concerned with animal behaviour, who has designed almost a third of the facilities for cattle breeding in the US, explained the mechanism by which her brain processed emotions as follows: "The fault lies in the fact that the emotional circuit is not switched on." She says that she does not have to suppress thoughts or memories like normal people do. "I have no section of memory that I must suppress. You have blocked connections there. I don't. No mysteries, no closed doors, nothing is hidden. I think other people have forbidden thirteenth rooms, because they cannot bear to speak of some things. The amygdala — an almond shaped part of the brain — locks up information from the hippocampus. But my amygdala does not produce enough emotion to shut information into the hippocampus."

Temple Grandin is author of the book *Thinking in Pictures* and many articles about the functioning of the autistic mind. In one of them, "My mind is a web browser: How people with autism think", she writes that her mind works like a computer. The linguistic part of the mind is the user of the computer and the rest of the brain is the computer.

In most people, the user and the computer are joined into one whole — consciousness — but in me they are divided. In non-autistic people, verbal thinking merges with the emotions, in me they are divided. It appears that I lack the higher level of consciousness formed by connecting abstract verbal thinking with the emotions.⁶

When she hears a word, her mind searches her memory for pictures connected with the word. "If you want to understand an autistic person, try to think like him", I was told by Mrs Martinková. "You will see how difficult it is to use only those words to which you can associate pictures." We non-autistic people think in language, we interpret meanings intuitively and automatically. Words do not affect us only by what they represent, but also by the emotional strength associated with them. We understand metaphors in their transferred sense. The work of consciousness is comparable to a work of art, writes N. Humphrey. Sounds and signs, which we perceive with our senses, the thoughts and ideas, which swarm in our minds, are like texts and pictures, film or music that act in two ways. They represent concrete objects from the outer world and they evoke feelings — pleasant, unpleasant, or indifferent. When we read the words, "We alternately dodged / between the falling bombs / and falling shit / and everywhere only pure principles",⁷ we understand it without having to imagine the concrete event it represents. When Matej Martinka heard stories at nursery school and saw how they pleased the other children, he said to his mother: "The children like hearing lies."

Autism is obviously a much more complex phenomenon than may appear from these brief notes. I deliberately chose cases that were striking to me. I have tried to illustrate the idea to which Baron-Cohen devoted a whole book: "When processing information about the world and about other people, we use a whole range of cognitive styles, from analytical systematized thinking, which processes information like a computer, according to rules, laws, and algorithms at one end of the scale, to metaphorical, empathetic thinking at the other extreme. Autism is an extreme case of computational thinking."

Empathy

Temple Grandin told Oliver Sacks in an interview that when she observes the social games of normal people, she feels like an anthropologist on Mars. What seems natural and obvious to us non-autistic people, what we understand intuitively, automatically, and implicitly, she must make explicit with the help of rules and algorithms, if she is to understand it. It is not surprising that for her, the thinking and behaviour of normal people seems strange, just as the behaviour of fairy-tale characters seemed strange for Matej Martinka. When an autistic person wants to understand the behaviour of other people, he proceeds like a "naive scientist", who seeks rules and principles of laws in human behaviour. The non-autistic person proceeds like a "naive psychologist", seeking intentions, feelings, and emotions.

The method of the naive psychologist is empathy: the ability to "read" the mental states of other people (their thoughts, intentions, convictions, and wishes) and to "put himself" in the position of having the feelings and emotions associated with them. The autistic use the method of "systematic thinking": they analyze the structure of the system, they identify relationships between its elements and formulate laws by which these relationships are directed. This is why they are so good at the analysis of technical systems, in biology, geography, mathematics, taxonomy, or programming, and so weak in social interaction. "They do instinctively what we have to learn and they must learn what we do instinctively" (M. Martinková).

Nicholas Humphrey was probably the first to point out (in the article *Natural Psychology*) that life in society demands a different type of intelligence to that measured by IQ tests. It requires intelligence based on empathy. A few years

after the publication of his article, a group of neuroscientists at Turin University conducted an experiment that confirmed Humphrey's idea. Empathy is not a moral virtue that we must learn, but a biological characteristic, which enables us to live in groups such as families, nations, and various other types of social network. These scientists discovered that various groups of neurones in the pre-motoric region of the front lobe of apes are very active when the ape undertakes certain specific activities: picking, cracking, cleaning, and eating nuts. They thought it was a matter of motor neurones directing the activity of various muscles. However, the surprising thing was that the same neurones were also active in the brain of an ape which only watched another ape cracking, cleaning, and eating nuts.

Six years ago, when S.V. Ramachandran published an article on mirror neurones and their role in social intelligence and the evolution of culture,⁸ he received mostly critical reactions. The critics pointed especially to two problems: 1) It is too simple to conclude something about human behaviour from the behaviour of apes. 2) The mirror neurones are found in the motor part of the brain, so how could they influence communication and empathy? However, the research done in the next year or two showed that the mirroring neurones in humans do even more than in apes. They are more or less the "neural correlates" of empathy and the ability to read the minds of other people. "It has been proved that the mirror neurones enable us to understand the thoughts and feelings of other people, not consciousness and thought, but instinctive feeling", wrote G. Rizzolatti, one of the scientists who made the discovery. He also discovered that in autistic children these neurones do not work or their activity is much lower than in the non-autistic. Investigation of signals from the appropriate areas of the brains of autistic and non-autistic children showed substantial differences when they looked at portraits of faces expressing anger, joy, or grief.

It is difficult to think out the consequences of this discovery today. Surprising new findings are published almost every month. However, one thing is certain: this discovery will significantly influence the way we think about morality, religion, cultural diversity, and the origin of human society. It seems that Thomas Hobbes was wrong: man (or at least non-autistic man) is not a rational individualist who is naturally uncooperative and is only forced by reason to form communities. Just as our brains are equipped with a disposition to process visual information about the world around us, they are also equipped with a disposition to process information about the inner world of other people. The mirroring neurones form a connection between the feelings of other people and my brain. The remarkable thing is that these neurones are activated not only when I do something or see somebody else do something, but also when I imagine some activity or I remember it.

Cognitive framing

Empathy may be essential for social life, but it is not enough. Apes also have mirror neurones, but they cannot form such complex and changeable forms of social life as humans. For society to exist and function, a set of common beliefs and undoubted truths is needed. The members of the community draw their views from these. These beliefs and truths form a sort of "cognitive frame", which shapes the way we perceive ourselves, the world, and society. "Without common beliefs, people would still exist, but not as a social unit" (A. de Tocqueville).

The Ancient Greeks already recognized the power of cognitive framing. Ancient tragedy formed frames combining a large number of heterogeneous concepts, values, and ideas — fate and heroism, gods and essence, the ennobling role of suffering, the transcendental character of tragedy, and so on. In the myth of Oedipus, the King of Thebes, Laios, hears a prophecy that he will be killed by his son, who will marry his mother. The king believes the prediction and attempts to get rid of his son, which leads to the fulfilment of his and his family's tragic destiny. The "undoubted truth" that framed the thoughts and actions of Oedipus and his family was the truth of the prophecy. If King Laios had not believed the prophecy, Oedipus would have had a happy childhood, would not have killed his father or had children with his mother, and today we would not have the "Oedipus complex".

Every reframing changes the view of the world. Reframing may change a tragedy into a banal story, make a murderer into a patriot and a psychopath into a hero, or vice versa.

We know the importance of the role myths have played and still play in the formation and strengthening of collective identity. Karen Armstrong appears to be right when she writes that we should give up the nineteenth-century error that holds that a myth is untrue or represents a lower form of thinking, and that we should adopt a more educated approach to myth.

Perhaps the most interesting findings about the influence of framing on human thinking, perception, and action, which could help us to achieve a more educated approach to myth, are emerging today from the cooperation between the social sciences, psychology, and neuro-science. I will mention at least one example, which illustrates well the strength with which positive and negative framing influence the way of perceiving one and the same situation. It comes from the work of cognitive psychologists D. Kahneman and A. Tversky, for which they first gained the Nobel Prize for economics in 2003. These authors asked one group of doctors question no. 1 and a second group question no. 2.

1. Imagine that the country is preparing for the outbreak of an infectious disease, which could kill 600 people. Two alternative programmes were proposed to deal with it: Programme A, which would save 200 people, and programme B, in which the probability of saving everybody would be $1/3$ and the probability of saving nobody $2/3$.

2. Imagine the same situation and two alternatives proposed to deal with it: Programme C, in which 400 people would die; and programme D, in which the probability of saving everybody would be $1/3$ and the probability of saving nobody $2/3$.

In the first group, 72 per cent of the questioned people chose the conservative strategy (A) and 28 per cent the risky strategy (B), while the result from the second group was the opposite: 22 per cent chose the conservative strategy (C), while 78 per cent chose the risky strategy (D).

A multitude of cases are known from literature and from life, when perception of a situation and the decision on how to react to it are not determined by the facts and rational calculation, but by framing and emotions. With negative framing, the risk is accompanied by more positive emotions than the losses, while with positive framing the reverse is the case. To explain this phenomenon, the neurologist Antonio Damasio proposed the hypothesis of somatic markers: "If the possibility of an unfavourable result flashes through

your thoughts only for a moment, it gives you an unpleasant feeling inside." Somatic markers are bodily feelings, which point to a negative result certain behaviour could have. They serve as warning signals. They are one of the factors apart from analysis and rational consideration which influence our decisions and behaviour. Somatic markers are a specific case of the feelings, determined by a combination of the situation and the supposed results of certain scenarios for action in the future. If a negative somatic marker is associated with certain possible results, it acts as a warning, but a positive somatic marker acts as a stimulus.

Consciousness

How does the human mind select from this immense quantity of chaotic information, with which it is constantly bombarded, and how does it organize the information into meaningful wholes? Do we control this process consciously or does it happen somewhere in our brain and we are only aware of it in a supplementary way? Do we decide on the basis of free will or is free will only an illusion of the supplementary rationalization of our decisions? But what is consciousness? It seems that first we should know the answer to the question, "What is consciousness?" Only then can we begin to research how it works. However, the problem is that there are almost as many definitions of consciousness as there are authors concerned with the problem of consciousness. The most general definition and the one closest to intuitions come from John Searle: "Consciousness is the set of percepts, feelings, and everything we are aware of when we wake up in the morning from sleep without dreams, and what continues as long as we do not fall into a coma, die, fall asleep, or fall into unconsciousness in any other way." However, we can have percepts, feelings, and many other mental states without being aware of them. Extreme cases include blindsight, when a person sees without being aware that he sees,⁹ or autism, when a person has feelings but is not aware that he has feelings. Less extreme cases are the feelings by which we react to positive or negative framing of situations. We are not aware of them, but they determine how we decide in certain situations and how we think about them.

There are things that do not depend on the concepts associated with them, for example, "sickness" or "earthquake", and there are things that do depend on concepts, for example, "capitalism", "democracy", or "money". Sicknesses and earthquakes would still exist if we had no concepts for them. However, a piece of coloured paper is money only for somebody with the word "money" in his conceptual equipment. Consciousness, like capitalism and money, is not something that exists independently of language and communication, but precisely thanks to them.

When we attempt to explain how money works to somebody who has never seen money and does not know its purpose, we use metaphors from his experience of the world. Today, when people concerned with human thinking attempt to explain how the mind functions, they use metaphors from information technology: computer, neural network, robot. The use of such metaphors enables us not only to model, but also to understand many intellectual activities of the human mind. It also enables us to simulate and reproduce them in a computer, but the mind in the models is the mind of a "model autistic person", with no place in it for consciousness, empathy, feelings, and fantasy.

A better metaphor for the conscious mind is the cinema. Noël Carroll¹⁰ explains the power with which film acts on the mind of the viewer with two

facts: cognitive accessibility and framing (N. Carroll, 1991). Film is cognitively more accessible than other art forms such as literature and drama, because we can process it with the same cognitive and emotional equipment we use in everyday life. Even in the most fantastic film stories, we find simple, recognizable characters and motifs. The reasons for their behaviour can be interpreted and the results foreseen by a strategy similar to that used for interpretation and behaviour in everyday life. However, the cognitive accessibility of film images and stories is far from being an adequate explanation of the powerful effect of film. The factor that gives film its powerful effect is framing. The film technique includes a range of resources for orienting the attention of the public, manipulating meanings, and organizing information: mixing of colours, sounds, images, perspective, and detail; movement in time and space; cutting; and so on. However, film framing would not have such a powerful effect if it did not have a sort of opposite pole in the cognitive and emotional processing of the perceived events in the consciousness of the viewer.

When framing percepts, the human brain does similar work to a film director framing a film. Even the apparently elementary percept of a simple object is the product of complex selection, organization, and framing. The brain contains no anatomical area where the components of perception, let us say, of a tree and the concept "tree" are joined. The tree appears to us to be one thing, but our visual perception of a tree is dispersed through the whole brain. The visual percepts of colour, movement, shape, topological qualities, structures, part-whole, and so on are scattered through the brain, and there is no place where the information from different parts of the brain can be concentrated and unified. We perceive various objects as if they had a united appearance, but these united percepts are the result of parallel actions of the brain in many different areas. In this context, neuro-science speaks of the "problem of connection" and its attempts to solve this problem are still rather speculative. However, the important thing is that every percept must pass through a certain process of filtering, mixing, and framing, the result of which is that I see, let us say, an individual tree.

The present scientific picture of the human mind looks roughly as follows: the brain as an orchestra without a conductor and consciousness as a cinema screen, which reflects, but does not influence the processes occurring in the human mind. It was accurately described by the British neuroscientist Sarah Jayne Blackmore, who answered the question, "What do you believe, but cannot prove?", as follows:

I believe that I have free will, but I cannot prove it, because all science proves the opposite. Like every person, I am persuaded of this. It is because human beings were programmed by evolution to believe that they freely decide about what they do. In reality our brain decides before it informs us of the decision. For example, the part of the brain that controls movement, decides half a second before we are informed that we have decided to move. Another part of the brain then provides an explanation of why we moved. Thus, although I can retrospectively rationalize why I moved, my brain is always one step ahead.¹¹

However, this may not be a definitive picture of the mind. Interesting new findings are coming from cooperation between neuro-scientists and experts on Buddhist meditation. Meditation enables us to research the mind from the

inside and supplement findings about its functioning obtained by science observing from the outside. In addition, experiments with people trained in meditation prove that consciousness is not as passive as a film screen. The brain can be trained by the consciousness and will like any other organ of the body.

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- ¹ Egon Gál, "Kognitívne vedy, aedová psychologia a zrkadliaci neuron", in Rybár, J. et al.: *Filozofia a kognitívne vedy*, Iris, Bratislava 2002.
- ² The letter continued with a description of the cognitive and emotional peculiarities of Matej Martinka and the problems he had in communication with other people. Then we met several times and exchanged some e-mails. Michaela Martinková wrote an article which we published, along with other texts by philosophers and cognitive scientists, in an issue of *Kritika & Kontext* on the problem of consciousness.
- ³ Daniel M. Wegner, *The Illusion of Conscious Will*, MIT Press 2002.
- ⁴ Simon Baron-Cohen, *The Essential Difference: The Truth about the Male and Female Brain*, Basic Books, New York 2003.
- ⁵ Oliver Sacks, *Antropoloúka na Marsu*, Mlada fronta, Prague 1995.
- ⁶ Temple Grandin, *Thinking in pictures*.
- ⁷ From a poem by Slovakian poet Tomás Janovic, entitled *Memories of the twentieth century*.
- ⁸ See: S.V. Ramachandran, "Mirror neurones and imitative learning as a moving force of the 'great leap forward' in human evolution", at edge.org
- ⁹ M. Jankovic, *Mohutny moment vedomia*
- ¹⁰ Noël Carroll, *Sila filmu. Sborník filmové teorie I*, (ed. V. Zuska), Prague 1991.
- ¹¹ Source unidentified, translated from the Slovakian by Martin Styan.

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