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The theory of mind – attempting to explain deficits in social skills among people with autism spectrum disorders

Teoria umysłu jako jedna z teorii wyjaśniających deficyty w zakresie umiejętności społecznych u osób ze spektrum autyzmu

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S u m m a r y

Autism is a life-long developmental disorder. Despite the fact that there are many scientific and popular publications on the topic, autism is still considered not a well-known disorder. Individuals with autism may come across as awkward to other people. The reason certainly does not lie in ill-will of the individual, but it is rather related to many deficits that autistic people present, especially in the area of social skills and communication. Cognitive literature suggests that individuals with autism have a deficit in "theory of mind", which is understanding mental states of other people, their thoughts and feelings. In the current article we will explain, based on clinical examples, how the deficit in the theory of mind may be an obstacle to proper functioning for children with autism.

Key words: autism, theory of mind, social skills

S t r e s z c z e n i e

Autyzm to całościowe zaburzenie rozwojowe, które trwa przez całe życie. Choć o jego specyfice można przeczytać w wielu publikacjach zarówno naukowych, jak i popularnonaukowych, stanowi on cały czas swoistą zagadkę i wyzwanie. Osoba z autyzmem w kontakcie z inną, w tzw. normie rozwojowej, może wywoływać u niej zdumienie, ciekawość, czasem zniecierpliwienie lub ją urazić. Nie jest to jednak efekt złej woli lub niewłaściwego wychowania, ale skutek poważnego deficytu, braku prawidłowo rozwiniętych elementarnych umiejętności społecznych, którymi posługujemy się spontanicznie, wchodząc w różnorodne relacje z innymi ludźmi. „Zrozumieć" osobę z autyzmem można tylko wtedy, gdy pozna się mechanizm jej myślenia, spostrzegania, motywacji i innych aspektów będących motorem codziennego funkcjonowania. Próbą wyjaśnienia odmienności osób z autyzmem jest koncepcja oparta na tzw. teorii umysłu. W naszym artykule spróbujemy wyjaśnić na czym ona polega, poprzez szereg kluczowych przykładów będących opisem wielu osób z autyzmem, z którymi zetknęłyśmy się w naszej pracy.

Słowa kluczowe: autyzm, teoria umysłu, umiejętności społeczne

We have been trying to help people with autism spectrum disorders for a number of years. We've conducted numerous diagnoses of children and teenagers, and sometimes adults, too. Some of them have been later diagnosed as patients suffering from autism or Asperger syndrome. Despite our considerable knowledge in the subject of the autism spectrum we often face the problem which even for us is both mysterious and fascinating – to what extend is perceiving of the human world by people suffering from symptoms belonging to the autism spectrum different from ours? What lies at the bottom of their problems?

One of the most disturbing symptoms observed by parents of younger children who were later diagnosed as those belonging to the autism spectrum patients, was little or no reactions to their own names and problems with making eye contact (1). It is unquestionable that most of the younger children with syndromes from the autism spectrum do not react when called by name, nor look at the caller in situations when eye contact would seem only natural.

It is also obvious that when somebody calls our name, when we greet or say goodbye to someone or when we are showed something, we at least take a look

at the other person. It's a spontaneous, clear communication sign, usually simultaneous with expressing certain emotions, such as: interest, curiosity, surprise, understanding, happiness, boredom, sadness, etc. But it's not so in case of the patients with autism spectrum disorders. They don't often look in the direction pointed by other people and don't make eye contact in situations which normally ask for this kind of reaction. When such patients make a request, they often focus entirely on the object they desire, an event they find interesting or an activity they enjoy (e.g. blowing soap bubbles or listening to the same piece of music over and over again). Even the hand of the person they ask for an object is treated by them as the 'tool' necessary to get it. It's very difficult to draw their attention or make them look at something. This kind of response demands focusing on other person and being able to read their intentions, whereas our patients concentrate on objects rather than people and do not usually realize that they are shown something, or that they were supposed to pay attention to something.

They don't seem to understand that there are reasons of drawing other person's attention other than making a request. Nor do they seem to comprehend another aspect of communication, which is creating a common ground of interest, related to the aspect of sharing with other people our emotions evoked by the same objects, subjects or activities (2). Most of us expect to be perceived and acknowledged. We also seek the confirmation that our way of perceiving the surrounding is similar to that of other people's. If anything unusual happens in our presence, we try to make sure that other people are also surprised, and interpret the situation in the way that corresponds to our expectations. Certain kind of interaction is thus established. We experience interactions of this kind continually in our life. However, they seem to be beyond the grasp of the people suffering from autism spectrum syndromes.

During interviews, our patients' parents point out the fact that their children involve themselves in disturbingly limited plays. The kids often enjoy exclusively manual activities which sometimes develop in their complexity. These activities are usually very schematic and hardly ever creative. They are mostly repetitive, too. The parents rarely see their children pretend something or take on different roles. They easily notice that their children play in a different way than other kids. The main difference is that most children within commonly accepted personal development norms, at some age prefer creative activities. They are able to see a car when looking at a wooden block, which can next turn into a phone in their eyes, and after that – into a talking creature. Our patients will as a rule stick to the basic function of the objects they play with. They will not see in those objects any other features than the real ones, they will not imagine any objects in their surrounding, nor pretend they're something or someone other than themselves. They simply cannot pretend anything. Pretending is a state of mind, and in order to know how to pretend, we must know the difference between imagination and reality. It's vital to understand this particular agreement that we act out something we first imagine (2, 3). Children normally realize what it means. They say, for instance, 'I only pretended that I cooked this soup'.

The majority of our patients don't understand activities in which they're asked to take on different roles, pretend to be an animal or a story character. Neither do they understand why they should run away or hide as part of a game just to chase or find somebody minutes later. These problems cause major difficulties for them when playing with peers. Even when they do try, the results are awkward and unnatural. Literal treatment of objects, rules and customs is undoubtedly the base of these difficulties.

In the process of a diagnosis, the parents, and whenever possible also the children are asked standard questions. They are often confronted with various tasks, which enables us to assess, among others, their social skills, including their empathy level and the ability to look at the world from a perspective different from their own. In case of children with developed verbal skills, we check their ability to understand verbal messages. Our questions, but also spontaneous expressions result in somewhat comic situations. One diagnosed person, after hearing the therapist say, 'I can't remember now. It's on the tip of my tongue,' started to observe intensively the therapist's mouth as if trying to see what really is there on her tongue. She was so absorbed by it that for some time she was unable to concentrate on the conversation.

Some of the interviewed clients (who are usually eventually diagnosed as autism or Asperger syndrome patients) often explain with confidence the meaning of idioms or phrasal verbs they are asked about. And below we quote samples of such explanations:

- on one's shoulders – „a person has something on his shoulders";
- have one's heart in one's mouth – „the heart is in one's mouth";
- to know each other inside out – „I know the inside of your body";
- be all fingers and thumbs – „a person has only fingers and thumbs";
- badger – „this is not a person, he is an animal called a badger";
- be as happy as a clam – „he is happy the same as clams are";
- to have butterfingers – „his fingers are made out of butter".

The parents also give us examples of their children's literal understanding of verbal messages. One mother told us an anecdote from her son's classroom. The pupils had been asked to work individually and the sit up straight in their chairs after finishing the task. That was to be the signal to the teacher that the task had been completed. Our patient assumed that he should work on the task with his back bent down, and then straight it up. He later complained to his mum that he had a

backache because he had had to write in a very uncomfortable position. Another patient got terrified at the health centre when a nurse asked him to give her his arm during taking his blood sample. He thought she really wanted to take his arm away from him.

We can see, that to understand verbal messages properly we must first understand their author's intentions expressed by verbal and non-verbal aspects of communication, that is: intonation, gestures, body posture, facial and eye expression. All these aspects are necessary to understand jokes, metaphors, idioms, etc. For some children with the autism spectrum disorders it's easier to understand context anecdotes than jokes based on social agreements or playing on words. Being unable to understand the meaning of conventionality frequently results in them behave like a proverbial bull in a china shop. Their comments are often too blunt and considered rude. They don't know when something should be said and how, and when something should be left unsaid for the politeness sake. Most people would find it hard to accept as a compliment to hear, 'I like your yellow teeth', or answer the question, 'Why do you have a moustache, madam?'

Conversation plays a significant role in verbal communication and social relations. It's seemingly a simple interaction. To take place, a speaker and a listener are needed. However, a conversation consists of a chain of elements. Let us consider just a few of them. It needs a topic (which can be evoked by asking a question or sharing a piece if information), directing towards another person (coming up to someone and making eye contact, sometimes calling someone's name or drawing their attention in other ways) and taking turns. It's also necessary to understand received messages, read other people's intentions, be able to listen and derive information from the intonation or a particular emphasis. Moreover, it's important to express interest by meaningful: ahem, eh?, oh!, or such expressions as: You're joking!, Really?, By the way..., Would you believe?.., Speaking of which..., etc. Unfortunately, it is not obvious to people with symptoms belonging to the autism spectrum. We happened to observe children who talked to another person standing way too far, or on the contrary, almost making physical contact with them, delivered a monologue instead of actually talking, or even spoke to empty walls. People suffering from symptoms belonging to the spectrum of autism don't maintain conversation through confirmation. Talking to them usually consists in them answering questions in a very concise way, most often only by nodding or shaking a head. They don't use proper intonation nor emphasize important words to put a stress on something particularly significant or new for them. They can't comprehend why they are asked anything or in what ways whatever they say can influence other people (2, 4, 5). They have problems reading emotions necessary to make a conversation. And here we come to our next issue – recognizing, understanding and appropriate expressing emotions by the autism spectrum syndrome patients.

During diagnosing the children's emotional competence, they are showed a number of pictures or photos of people depicted in various situations and poses clearly expressing different emotional states, easy to explain from the context of the situation. For most of us it would be obvious that people presented in the pictures are happy, sad, scared, irritated or surprised. The vast majority of us would also be able to say why they are laughing or crying, show irritation or fear. It's not so in case of our patients. Even when they are capable of naming basic emotions, they've got serious problems explaining their adequacy to the circumstances. An eight year old boy, after seeing a picture in which a boy and a girl are covering their ears and are clearly upset (you can see that they are in a very noisy place) said, 'He is upset because maybe there's too much wax in his ear'. Looking at the picture, our patient probably remembered a problem with ears from his own experience.

The same boy, seeing a picture showing a smiling baby, speculated that: 'He looks like someone who says letter 's'. The boy was then showed another picture. In its foreground, a boy was sitting in a wheelchair and some children standing nearby were laughing and making unfriendly faces at him. The disabled boy's feelings were visibly hurt. You could see school walls covered with graffiti in the background of the photo. After looking at it, our patient said, 'These walls are dirty, damaged, sprayed over. You mustn't do it.

During watching mute animation films (such as old versions of Bolek and Lolek stories) or films with non-human objects (e.g. geometric figure) as the main characters, we can observe that people with the autism spectrum syndromes don't usually interpret them in an expected way. In case of the first type of stories, following the plot and understanding it properly is possible only if we can read all the non-verbal messages (gestures, mimics, etc.) appropriately. To understand the other type of films properly it's necessary to be capable of attributing human characteristics to non-human objects. Our patient can often follow the plot of such story, but they mainly (if not exclusively) focus on the sequence of activities performed by the story characters. However, they aren't able to attribute human characteristics to non-human objects or name emotions which make the story characters do something. For an average viewer watching a film with geometric figures as the story characters it would be clear, that a small circle likes a small triangle, that the small circle is scared (shakes with fear) when a big triangle doesn't let it leave a big rectangular (a house), that small figures are happy when they manage to outsmart the big triangle, that the big triangle is angry or even furious and that's why it destroys its house. It's also curious that our patients can see four figures as the characters of the story, whereas for the average viewer, the fourth figure (a big rectangular) is simply a house, part of the film's set design, and not its 'actor'.

We frequently ask our patients to make a short story from a set of pictures or photos. There are three types of stories at our disposal: mechanistic, behavioral and mental. Our patients have biggest problems making stories belonging to the last category. For example, we show a patient two photos. In one of them, a woman is standing in an open door and waving her hand at somebody whom we can't see. She's probably saying goodbye to this person. In the other picture, the same woman is sitting in a room, wiping her eyes with a handkerchief, visibly crying and very unhappy. The photos make a logical story only when we can perceive and understand the woman's emotional state, that is the sadness after separating from someone important for her. Such sequence of events would be incomprehensible for most people with symptoms from the spectrum of autism. They try to make a story, but their reasoning is often really surprising. One of our teenage patients speculated, that the woman is standing in the open door to let some fresh air into a house and she is later wiping her eye because something like a speck of dust got into it.

How all the problems presented so far can be explained? Are there any hypotheses to do it?

In her book "Autism. Solving a mystery" (2), Uta Frith analyses three theories. The first one is based on so called 'theory of mind'. The second one is the theory of a weak central coherence and states that, quote: 'People touched by autism syndrome prefer such a way of processing information which focuses on the details'. (2, p. 249). That is why they have problems processing any information and paying attention to its most important parts, as well as understanding it as part of the wider context. They simply have problems generalizing.

Third theory is connected with a concept of the lack of control from the higher levels of mind functions over the activities and concentration ability of autism patients. 'Problems with controlling behaviors which are not part of daily routine are a consequence of the lack of superior mental control. Executive functions disorders are the reason for stereotypical behaviour and limited interest.' (2, p. 249). Each of the three theories explains behaviours of people with autism spectrum disorders and tries to interpret different aspect of the brain functions. In our opinion, the first hypothesis, connected with the theory of mind, explains the above problems and the most important deficits that influence our social skills in the best way.

The theory of mind is a set of concepts and skills which enables speculating on other people's mental states. We can't actually see them, but we can logically assume them, because we are aware of the connections between the inner state of our emotions and their outer symptoms. In such meaning, the theory of mind is one of our cognitive functions, thanks to which we can recognize other people's mental states (their intentions, opinions, etc.) and as a result, comprehend complex human relations. It plays a significant role in understanding messages coming from other people (4).

And so, for that instance, to make a conversation we need to be aware of the subject of our interlocutor's interest and his competence level on this subject (what he knows and what he doesn't know), and we need to be able to draw conclusions from the received messages or information (5).

What seems obvious to us isn't so to a child with autism spectrum disorders. And here is part of an adult patient's memoirs:

'My mother remembers, that we she was driving me to my primary school I often panicked and demanded something from her. I used to ask, for example, 'Where is the pan?' My mother had no idea what I was talking about and had to ask me a lot questions to find out that all the pupils in the class were asked to bring a pan to school that day. It never came up to my mind that I should have told her about it for her to know.' (2, p. 256).

This kind of misunderstandings are the result of a specific way of perceiving reality and social relations by people with autism spectrum disorders.

In our everyday relations with other people we balance, often unconsciously, between what we intent to express and how we should do it to be socially correct. We assume an interaction – sending and receiving social communication signals. When we direct somebody, we observe their response at the same time, and according to it, or sometimes consciously confronting it, we decide on our next behaviours. We usually try to avoid hurting other people's feelings, we often make jokes hoping that they're properly understood. We are at times ironic to let other person know that we disapprove of their behaviour.

The vast majority of us understand typical jokes, irony, metaphors and comparisons, but there are exceptions. Some people can feel hurt by our joke or irony, while others wouldn't even notice and ignore it. Patients with autism spectrum disorders belong to the last group.

In the twentieth century, Simon Baron-Cohen, Alan Leslie and Uta Frith propounded a hypothesis that children with autism spectrum disorders lack the understanding of other people's behaviours. To understand the behaviour of others we need proper functioning of the theory of mind. This theory is a skill programmed into human mental development and evolves since our early childhood. Normally developing five year old child knows the meaning of pretending and cheating, and is able to understand, that other person's opinions can differ from his own. But younger children behave as if they assumed that everybody likes, thinks and has the same knowledge they do (2).

Below are the results of the lack of properly developed theory of mind in people with spectrum of autism disorders:

- they don't understand that to see means to know,
- they can't see the difference between an object's features and its potential meaning in another conventional role (they won't comprehend that a ba-

nana kept at the ear can play a role of a telephone receiver),
- they give random answers when they choose from a set of words related to the states of mind,
- in spontaneous speech they rarely use vocabulary related to the states of mind (think, imagine, know, etc.),
- they never pretend and they don't understand the concept of pretending,
- they don't identify eyes or facial expressions as important sources of information about emotions and states of mind,
- they do understand basic relations between emotions and events, but they don't understand more complex causes of emotions, e.g.: they realise that somebody is happy because he or she got something, but it's difficult for them to comprehend that someone can look happy just imagining that he or she got something,
- they can't see the difference between accidental and intended activities; the don't understand the concept of intentions,
- they don't know when they are being cheated or deceived; they don't realise that someone can intend to manipulate them,
- they are not able to understand metaphors, sarcasm, irony (anything that goes beyond a literal message) (6, p. 79).

What can help to confirm the hypothesis that the theory of mind doesn't evolve properly in people with autism spectrum disorders? A variety of tests have been created for this particular purpose. Here are the most popular ones (2):

– Sally-Ann test – checks the ability of patients to understand the fact, that other people can have beliefs which are different from their own. Two puppets are used to conduct this test. One is called Sally and the other one – Ann. A following role-play is acted out. Sally has got a box, Ann's got a basket. Sally puts her favourite toy (e.g. a doll) into the box and leaves the set after telling her friend Ann about it. While Sally is out, Ann takes the toy out of the box and puts it into her basket. At this moment, first control questions are asked to check patient's understanding of the plot: Where did Sally hide the doll? Where is the doll now? If the patient answers them correctly, we proceed with the story. Sally comes back. We ask the patient a next question: Where will Sally look for her doll? The correct answer is: in Sally's box, because Sally didn't see Ann take it and put it into her basket. Children with spectrum of autism disorders as a rule say that Sally will look for the toy in Ann's basket. Their answer corresponds to their knowledge. The don't understand that to know that the doll is in Ann's basket, Sally would have to have seen Ann put it there. That Sally can't know that the toy is in Ann's basket because she was absent from the room when Ann took it from Sally's box.

– Test of a deceptive box – to conduct it a box is needed (such as an M&M, puzzle or a coloured pencils box). It's important that the box is opaque (you mustn't see what's inside) and that a patient is familiar with it (the box should suggest its contents). We empty the box beforehand from the original contents and put something new inside (a button, a coin, etc.). We then show the box to the patient and ask: 'What's inside?' If it's an M&M box, patients usually answer that M&M sweets. They assume it on the base of their previous experience. And next we ask the child to check what's really inside. We let him look inside the box into which we had earlier (without the kid knowing about it) put some other object. The patient finds out that there is, let us say, a coin in the box instead of sweets he expected. We then ask the child what will his mum, or someone else absent from the test room, say when asked about the box's contents. The correct answer is M&M sweets, but the child with autism spectrum syndrome answer incorrectly: 'Mum will say that there is a coin inside.'

– Test of passing important messages (by Josef Perner and Sue Leekan). We need an attractive toy and two professionals to conduct it. A patient is shown a toy, such as a bee, as something really special. We tell the patient about its exceptional skill, the skill of flapping the wings. One of the specialists mentions with fascination, that the toy bee has one more exceptional feature. At this very moment, the other specialist leaves the room, and the patient is clearly informed about it. The first professional goes on telling the patient with excitement about the other feature- nodding its head. The absent specialist comes back and asks the patient: 'What can this toy bee do?' Children with autism spectrum syndrome often tell about both features in their answers, whereas they should tell only about the ability of nodding the head, because the specialist is absent when this skill is presented. Such was the answer of normally developing children.

Properly evolved theory of mind affects our social functioning. In case of the spectrum of autism patients this function doesn't develop correctly which leads to substantial disorders in their social progress. Does it mean that they are not able to comprehend social relations? According to the researchers (3, 7, 8) on the subject of autism special training can affect shaping skills conditioned by the theory of mind (making eye contact, pretending, sharing attention, etc., can be taught). However, it's a compensatory method of teaching. 'Because consciously learnt theory of mind is neither intuitive nor automatic, using it in everyday life goes slowly and is not enough to completely normal communication with others' (2, p. 249). Our experience allows us to claim that special training often proves be very effective, however, people with autism spectrum disorders, even those with a high level of independent social functioning, will not be able to avoid problems with social interactions, each one of them of a different kind. There are impressively effective strategies of teaching social skills at our disposal, and they are evolving constantly, but there are still not enough of them to reach the aim of teaching our patients all the social skills that the majority of their peers possessed in a natural way.

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